Book of Abstracts

12th Annual Open and User Innovation Conference

2014, 28th - 30th July

12th Annual Open and User Innovation Conference

July 28-30, 2014

Harvard Business School and Organizers:

Carliss Baldwin (HBS)

Karim Lakhani (HBS)

Stefan Thomke (HBS)

Eric von Hippel (MIT)

Benjamin Mako Hill (U of Washington)

CONTESTS AND CROWDSOURCING

FIRMS' INTERACTIONS

LEAD USERS

OPEN INNOVATION

CROWDFUNDING

USER COMMUNITIES

LAW, POLICY, AND IP

USER HEALTH

OPEN SOURCE

PROBLEM SOLVING

DIFFUSION

TOOLKITS

Beyond Pricing Decisions: Business Model Innovation in the Two Sided Market of an Open Innovation Intermediary

Contests and Crowdsourcing - Full Presentation

Andy Zynga, Lüttgens Dirk, Frank T. Piller

Open Innovation is a way for organizations to go beyond their own four walls in order to find, or inspire new knowledge, ideas, and technologies (Chesbrough, 2003). One specific method of gaining access to technologies and expertise has emerged with the creation of "open innovation marketplaces" since about the year 2000. Such marketplaces are usually run by Intermediaries – specialized firms that provide professional knowledge search expertise to companies seeking knowledge or innovations. Intermediaries operate as a platform provider that enables interaction between two networks that value each other's presence – the Innovation Seekers and the Solution Providers. Thus, intermediaries operate under the framework of two-sided markets (Rochet and Tirole, 2003). This study focuses on the two-sided business model of OI intermediary NineSigma, and specifically their technology search process that is typically done in the form of an open broadcast search (Jeppesen and Lakhani, 2010). The current literature on two-sided market models is focused on the analysis of "optimal" pricing for both market sides (Eisenmann et al., 2006; Kouris and Kleer, 2012). However, current studies on two-sided markets see the quality of service as a fixed parameter, which in the case of NineSigma is clearly not indicated as will be shown. Business model innovation is not just about pricing, but also service innovation; and to the best of our knowledge, no one has looked at the impact of service innovations on the overall success of an intermediary. In order to analyze how business model changes impact the success of different market sides of an Open Innovation Intermediary that operates in a two sided market we designed a multi-method approach: The qualitative research approach allowed us to gain good access to NineSigma's business model structure and process; especially interviews and workshops with Service staff and the CEO of NineSigma that has been with NineSigma since the inception of the business. However we also address quantitatively why and how certain service elements have evolved based on decisions made through learnings, and illustrate specific cases where these decisions have influenced the overall outcome of the technology search process on both networks (and market sides). The paper provides insights threefold:

1) The paper overalls gives a detailed overview about the working of an intermediary business, and the innovations taking place in their business model.
2) The paper points out the intermediary service elements that have had significant impact on overall success of open innovation process of their innovation seeking clients.
3) Finally, this paper identifies that in reports on success with open innovation involving intermediaries, the focus has always remained on either the innovating company, or the Solution Provider, whereas the functioning of the intermediary has always been taken as a static element. The paper points out that the functioning of the intermediary – an important link in the open innovation process – is dynamic, and is continuously evolving, so as to improve success rates of its clients' open innovation endeavors.

Strategy Formulation and Execution Open Innovation Pilot Projects

Contests and Crowdsourcing - Full Presentation

Jeffrey R. Davis, Elizabeth E. Richard

This paper describes the strategic change efforts of the Space Life Sciences Directorate (SLSD) at the NASA Johnson Space Center from 2005 to the present. In 2005, the SLSD experienced a 45% reduction in its research and development budget as new operational programs caused an overall reduction in the NASA research and development budget. This reduction resulted in a loss of some core capabilities through reductions in personnel, contracts and grants.

In response, the SLSD leadership formulated a new strategy to build resilience into the organization and buffer future budget changes. To inform and frame the strategy, the authors developed and conducted a visioning workshop using scenario planning with the extended leadership team. The visioning exercise charted a new course for the SLSD grounded in the pursuit of strategic alliances and other collaborative efforts with external partners to augment internal capabilities and resources, and provided the basis for a formal strategy that delineated strategic goals and objectives spanning 20 years.

The Space Life Sciences Strategy was published in May of 2007, with the vision "To become the recognized world leader in human health, performance and productivity for space exploration," and a mission "To optimize human health and productivity for space exploration."

Strategies and goals focused on driving innovation in human health and performance through collaboration, with an emphasis on solutions that both meet NASA needs and benefit life on Earth. The strategy led to the development of a risk management approach for the human system, and the identification of 32 human system risks, the mitigation of which are key to enabling successful long-duration human space exploration. Addressing these risks formed the portfolio of work for Space Life Sciences, and a key goal in the strategy sought to balance the portfolio of internal work with external partnerships and alliances. Prior to executing the strategy, a benchmark was designed and conducted to determine how to best identify, establish and manage alliances to set the stage for enhanced collaborative efforts. Two virtual centers were established to facilitate collaboration and sharing of innovation best practices among government, industry, academic, and non-profit members.

A key component of the change efforts at NASA became the use of open innovation problem solving platforms since exposure to Harvard Business School cases in 2008. Results of pilot projects from 2009-2011 and follow-on open innovation work will be presented.

Innovation Trajectories - Managing Open and Close Approaches in Innovation Process

Contests and Crowdsourcing - Full Presentation

Shantam Shukla, Mukund Dixit, Anil Gupta, Sanjay Verma

Innovation as a source of competitive advantage helps firm gain superior returns from market. Until recently, innovation activities were generally restricted inside firms and in some cases to select partners, to limit potential spillovers of knowledge that could undermine the uniqueness of innovation. The last two decade has witnessed the emergence of open practices where private enterprises open all or select innovation activities for anyone with interest to participate. Referred to as "open innovation" approach to innovation development, organizations have shown different patterns of openness in their innovation efforts. The patterns of openness refer to the levels of openness and stages of openness in the innovation process. According to the study, openness is classified as "closed", "semi-open" and "open" categories of openness depending on opportunity for external members to engage in organization's innovation effort. Openness is also exhibited across the different stages of the innovation process referred in this study as idea, execution and value capture stages. Thus, an innovation can have different form of openness across the innovation process. In this thesis we argue that openness is a strategic choice of an organization represented by different levels of openness across the stages of innovation process.

The focus of this study is to understand the determinants that influence the level of openness across the stages of innovation process. Based on an in-depth study of innovation projects from five different organizations from automobile, computer and information technology and engineering sector we can conclude that different factors influence openness across the stages. In addition, the influence of factors varies with the stages of the innovation process. This is the first study that has looked at openness across the innovation process. The insights from the study provide arguments for making the strategic choice of openness across the stages of innovation process

Embedding an open innovation strategy in emerging markets: The case of Natura the largest Brazilian cosmetics company

Contests and Crowdsourcing - Full Presentation

Henry Lopez-Vega , Wim Vanhaverbeke, Adriano Jorge, Leonardo Garnica

Over the last decade, open innovation has been fiercely studied. Yet, although we understand its benefits e.g. speed, performance and limitations e.g. breadth and depth, appropriability, limited attention has been devoted to the implementation of an open innovation strategy. While existing studies presented the outcomes of open innovation programs e.g. P&G's Connect+Development program, GE's ecomagination initiative, Fiat's research center, Xerox's PARC , these do not portray the evolution or contribution of these programs into firm's innovation strategy. Specifically, previous research has not emphasized how these open innovation programs can change MNCs structures, processes and search strategies to increase the impact of open innovation within the firm. This article presents, over 13 years, how Natura – the largest Brazilian cosmetics company – evolves from an unstructured open innovation initiative to a corporate open innovation strategy. It achieves this success through stepwise improvements of its proprietary open innovation program –Natura Campus Program –, development of an open innovation team and permanent relationships with industry and academia. Currently, Natura is not only the largest natural cosmetic company in Brazil and one of the largest in the World but also – according to Forbes –one of 10 World's most innovative companies.

This paper contributes to previous open innovation literature showing how an open innovation team changes its role throughout 13 years and increasing the impact of innovation at a large MNC in the cosmetics sector. This article connects the open strategy literature and open innovation programs e.g. Connect+Development, GE's ecomagination initiative. We shed light to our findings with selected successful and failure cases that confirm the value of internal and external platforms to embed open innovation within large MNCs.

Solve, Buy or Broadcast Search? An Empirical Investigation of R&D Managers' Governance Choices for Problem Solving

Contests and Crowdsourcing - Full Presentation

Ihl Christoph** , **Lüttgens Dirk

The open innovation paradigm has spurred new interest in ways how firms can gain from interacting with external knowledge sources. Most research to date assumes a holistic, firm-level perspective on open innovation. A micro-level understanding, however, of when and why certain open innovation practices are adopted for specific innovation tasks at hand is still missing. We want to address this gap by investigating managers' decision to solve technical R&D problems by the means of broadcast search. This search for unknown solvers or solutions via open innovation platforms and intermediaries constitutes a new alternative next to in-house problem solving or self-reliant search for designated external partners. Drawing on recent theoretical approaches related to knowledge governance and problem solving, we dimensionalize technical R&D problems as unit of analysis in order to determine relevant problem attributes that managers base their governance choices on. Based on an empirical analysis of 220 R&D managers' actual and experimental governance choices for problem solving, we find that those R&D problems are suitable für broadcast search, which are novel to the firm and potentially related to many distributed and hidden external knowledge sources. But at the same time problems should be structured and not too complex. Next to overall adoption, problem attributes explain decision makers' focus on aspects of value creation versus value capture in broadcast search. There is significant heterogeneity or bias in these governance choices that can be related to firm and decision maker characteristics. These sources of misalignment between broadcast search and R&D problems can be shown to have adverse outcome effects.

From Problem Solvers to Solution Seekers: Dismantling Knowledge Boundaries at NASA

Contests and Crowdsourcing - Full Presentation

Hila Lifshitz-Assaf

The capacity to innovate has always been the Holy Grail for R&D organizations. Recently scholars have argued for shifting the locus of knowledge creation and innovation outside the boundaries of the traditional processes; naming this approach "open", "peer production" or "distributed" innovation. Organizations are experimenting with these approaches yet there little research on how organizational members open these boundaries; shift the locus of innovation and the ensuing impact. Prior literature on knowledge, identity and professionalism predicts a fierce rejection of this approach. Through an in depth longitudinal field study of NASA's experimentation with opening knowledge boundaries, I develop the concept of "knowledge boundary work", capturing the change in R&D work, and illustrate the mechanism of shifting the locus of innovation as a co-evolution of knowledge boundary work and professional identity work. I find that organizational members who dismantled their knowledge boundaries expanded and even reconstructed their professional identity from "problem solvers" to "solutions seekers". This entailed a significant transformation both in the R&D knowledge creation process and the members' professional identity and capabilities. This enabled, in turn, further boundary dismantling. I suggest future research directions and discuss the theoretical contributions of these findings on innovation and knowledge, identity, and technology, work and organizations.

Selecting the Crowd or an Expert? An Empirical Analysis through a Problem-based View

Contests and Crowdsourcing - Full Presentation

Carolin Haeussler, Vieth Sabrina

Since the beginning of time, mankind has been driven to find solutions to problems. In an era of open innovation, sourcing of external knowledge to develop solutions has gained momentum. Technology improvements have made the crowd a viable source of knowledge. So far, the selection of crowds versus other traditional ways of seeking knowledge is far from being understood. In this paper, we introduce a framework in which we propose a sequence of problem solving approaches which ranges from solving independently, making use of crowd knowledge, targeting experts via an open call and directly approaching experts. An empirical analysis of 3085 problems solved by 262 individuals gained from the television game show "Who wants to be a Millionaire?" suggests that this sequence is sorted along two main determinants: problem difficulty and field-related expertise. Moreover, these determinants are moderated by the strength of the social environment in which the problem solver acts. Our study offers implications for the knowledge-based and open innovation literature as well as implications for practitioners in terms of problem solving approaches on the individual and organizational level.

Toward a behavioral theory of open innovation

Contests and Crowdsourcing - Full Presentation

Oliver Alexy, Elif Bascavusoglu-Moreau, Ammon Salter

Although open innovation has become increasingly established in the management literature, comprehensive theoretical explanations of what drives firms to be open are sparse. By taking the perspective of the behavioral theory of the firm, we conceive of open innovation as a form of non-local search. We argue that firms are prone to use open innovation when substantially under- or overperforming their aspirations. We further enquire how this relationship is moderated by firm-specific assets crucial to innovative activity: human capital, R&D investment, and patenting activity. Operationalizing open innovation as a set of practices, we employ a representative survey of UK firms to test our hypotheses. We find strong evidence of moderation, allowing us both to present explanations for the drivers of search through open innovation as well as contribute to the behavioral theory of the firm itself.

Innovation Contests in double unknown: designing generic technologies

Contests and Crowdsourcing - Full Presentation

Olga Kokshagina

Following the open innovation paradigm, many technological firms organize idea contests to surface bright ideas for new products, services or business models. This article investigates a new form of innovation contest: the generic technology idea contest, which aims to design technological platforms that address emerging applications in various business domains. Based on the analysis of three innovation contests conducted by STMicroelectronics, the findings indicate that, contrary to usual marketplaces for technology, this new kind of innovation contests do not fundamentally establish commercial relations between seekers and solvers. Indeed, such contest does not allow determining initially incentive mechanisms since the targeted markets are still unknown. The paper demonstrates that the generic technology idea contest creates design alliances that are able to collectively explore and develop generic technological platforms of multiple markets.

The Network as the Crowd in Crowdsourcing

Contests and Crowdsourcing - Mini-Talk

Allan Afuah

What if the crowd in crowdsourcing were a network? Would that increase or decrease crowdsourcing performance? In this paper, I argue that crowdsourcing performance in a network depends on whether the knowledge required to solve the problem resides in the network or not. On the one hand, if the knowledge required to solve a problem resides in a network, crowdsourcing performance is positively associated with four factors: high broadcast connectivity, large network size, high network cohesion, and low peripheral orientation. On the other hand, if the knowledge required to solve a problem is not in the network and the problem must be solved outside the network or the solution knowledge acquired from the outside, these four factors decrease, rather than increase, crowdsourcing performance. These relationships are moderated by the characteristics of the problem to be solved, the solution knowledge, and the solutions to be evaluated. The paper has implications for both research in crowdsourcing and networks.

Design of tournament-based crowdsourcing for business model innovation

Contests and Crowdsourcing - Mini-Talk

Lettl Christopher, Christian Garaus

Changing the organization's business model is difficult, but essential for achieving and sustaining competitive advantage. While research on open innovation has demonstrated that leveraging knowledge from external sources can be beneficial for product innovation, business model innovation (BMI) is still mainly done internally. Conducting BMI internally seems reasonable as it is typically a highly complex problem depending on considerable contextual knowledge (e.g., value chains, target markets, ecosystem) that cannot be transferred to external actors easily. However, business models that were successful in the past may dominate thinking about the way business is done, leading to cognitive inertia, and hindering BMI.

This research project investigates how organizations can tap into external knowledge for BMI. Among the many different ways of using external knowledge for innovation processes of a firm, particularly crowdsourcing ideas via contests ("tournament-based crowdsourcing") has been identified as suitable way for solving problems. Although prior literature has demonstrated that crowd-sourced solutions of technical, scientific, and design problems in product innovation are superior to internally generated solutions, it remains unclear, if tournament-based crowdsourcing is also suitable BMI.

Thus, this research addresses the questions whether organizations can leverage contests for BMI and how such crowdsourcing initiatives need to be designed. The design covers issues like framing the BMI challenges in such a way that they appeal to a large number of problem solvers from many different domains and deciding on the form collaboration (e.g., individuals versus teams of solvers). It also includes the issue of framing the BMI challenges so that they are not too complex for individual solvers or teams of solvers. This involves aspects of decontextualizing specific knowledge about the firm. Issues of intellectual property rights and undesired knowledge leakage need also be addressed. Another important feature of the conceptual design of crowdsourcing initiatives is the design of the incentive scheme for participants. After all, the success of crowdsourcing initiatives strongly depends on whether a posted challenge is able to attract a critical mass of capable problem solvers. A particular challenge is also the assessment of the crowd-sourced ideas. Who is best situated to perform this assessment? Are firms even capable of assessing the ideas or do their cognitive schemes, structures, and routines hinder the identification of radical BMI? Is a crowd-based assessment a valuable complement?

To study the design elements of tournament-based crowdsourcing for BMI, we conduct field experiments co-designed with companies interested in innovating the way they "do business". To the best of our knowledge, this would be the first time crowdsourcing is scientifically studied with a field-experiment approach as a tool for corporate innovation in general and BMI in particular.

This research will develop insights regarding how crowdsourcing needs to be designed for BMI and to what extend it can be leveraged for BMI. These insights are relevant for both theory and practice. While research on open innovation and crowdsourcing has been predominantly looking at product innovation, this project will extend prior research by studying the relevance of crowdsourcing as search and selection device for BMI.

A Longitudinal Approach to Cost-Benefit Considerations of Crowdsourcing Participants

Contests and Crowdsourcing - Mini-Talk

Vinzenz Treytl

Summary: Addressing the problem of recruitment and retention of crowdsourcing platforms, this research project focuses on cost-benefit considerations by platform participants during their journey from potential user to ex-user. An emphasis is placed on process benefits. Findings from other fields, particularly research on video games, are incorporated.

Keywords: crowdsourcing, user costs, user benefits, process benefits, participatory motives, gamification, video games

Crowdsourcing has been shown to be a potentially powerful tool for solving problems in various settings ranging from the corporate world (e.g. Tapscott & Williams 2006; Jeppesen & Frederiksen 2006) to the fields of science and non-profits (e.g. Cooper et al. 2010; Franzoni & Sauermann 2013). Generally, crowdsourcing is becoming a more important part of businesses' open innovation agenda (Chesbrough & Brunswicker 2013).
One key mechanism making crowdsourcing successful is the localization of distant search (Afuah & Tucci 2012). The ability to access a wide-spread and diverse crowd seems to be crucial for this localization (cf. Jeppesen & Lakhani 2010; Franke, Poetz & Schreier 2014).

Accessing and maintaining such diverse crowds, however, is challenging. High levels of churn as well as the difficulties of retaining participants for an extended period of time, lead to a constant need to recruit new users (Bayus, 2012).

The goal of this research project is to study these problems of recruitment and retention. A user's journey is examined under the assumption that (potential) users of crowdsourcing platforms base their decisions to join, stay and exit on considerations including outcome benefits, process benefits and costs of participation. A user is assumed to weight these costs and benefits differently during her journey from first contact with a platform to final exit from a platform.

A particular emphasis is placed on process benefits. This type of benefits has received relatively less attention in a crowdsourcing setting so far (cf. Raasch & v. Hippel 2012), although research on toolkits has shown that process benefits can add significant value for users (e.g. Franke & Schreier 2010). Interestingly, even negative process benefits (ie. effort) can increase perceived value for users (Franke, Schreier & Kaiser 2010; Franke & Schreier 2010). An area in which process benefits are central is video games. Basically, computer games are software products developed for entertainment purposes (cf. Barr, Noble & Bidlle 2007). Early research transferring aspects of games into crowdsourcing as well as corporate environments has shown interesting results (e.g. Thom, Millen & DiMicco 2012; Tuite, Snavely, Hsiao, Talig & Popovic 2011; Guy, Perer, Daniel, Greenshpan & Thurban 2011). Further investigations seem promising.

By answering the question of how outcome benefits, costs and process benefits are perceived by users during their journey from potential user to ex-user, this research project is expected not only to complement existing research on motivations of current participants but also to expand our knowledge on the big pool of non-

participants of crowdsourcing initiatives (cf. Franke, Keinz, Klausberger 2013). Especially, new insights on participatory motives of user innovation are expected.

Query formulation in crowdsourcing competitions: the role of abstraction level, pictorial examples, and solution schemes

Contests and Crowdsourcing - Mini-Talk

Philipp Topic, Nik Franke

Background

Inbound open innovation practices, such as customer co-creation and informal networking, play an important role for companies. Nevertheless a recent study by Chesbrough and Brunswicker (2013) shows that crowdsourcing, despite being intensively discussed by scholars and practitioners, plays a minor role for companies. Literature on crowdsourcing primarily discusses organizational aspects of this approach, e.g., incentives or interactions between participants (Bullinger, Neyer, Rass & Moeslein, 2010; Fueller, Hutter & Fries, 2012), the characteristics of the crowd, i.e. the people participating in crowdsourcing (Frey, Luethje & Haag, 2011; Jeppesen & Lakhani, 2010), and situational factors such as time spent, motivation of participants or external support. However, the nature of the problem task itself in form of a query is rather discussed from a theoretical point of view, such as in the aspect of task complexity and modularization (Afuah & Tucci, 2012). For companies interested in crowdsourcing, this implies a rather high degree of uncertainty when it comes to the handling of the query formulation in dependence of the expected crowdsourcing outcome.

Research question

To close this gap, the underlying research project will examine the effect of different types of query formulations on the success of crowdsourcing competitions. More specifically, in the course of an online experiment, we will investigate the influence of the language of the query formulation (verbal, pictorial), the degree of query abstraction, and the provision of solution schemes on participants' output in terms of quality and quantity of ideas. Research in cognitive psychology shows a positive impact of abstract concepts on problem solving (Crutch & Warrington, 2005; Ward, Patterson & Sifonis, 2004). Also, the picture superiority effect (Paivio & Csapo, 1973) and the concept of scheme induction (Gyck & Holyoak, 1983) contribute to first implications for the design of an ideal query formulation. Furthermore in the field of psycholinguistics the concept of word and picture abstraction plays an important role concerning the reasoning and memory of experts (Zeitz, 1997). As a result, the research project will also uncover the relationship between different cognitive characteristics of solvers and the underlying query formulation designs. The expected results will contribute to effective query formulation design by companies when engaging in crowdsourcing problems, thus generating query formulations which attract more qualitative solutions provided by solvers. To another aspect, the results should contribute to the question how to address only solvers with a specific set of characteristics, e.g. Lead Users (Franke, von Hippel & Schreier, 2006) in a crowdsourcing competition.

The Contribution of Different Online Communities in Open Innovation Projects

Contests and Crowdsourcing - Full Presentation

Michael Zeng

Online communities used as resource enlargement in open innovation processes are a promising concept. The different characteristics of the different online communities need to be considered. Therefore, this paper identifies the different cultures of innovation communities and brand communities in the environment of the Web 2.0 and shows how to use and further exploit their potential in new product development processes as well as increase their loyalty to the brand. To analyze these online communities, an exploratory case study design with ten small- and medium-sized enterprises (SMEs) served as a basis. All ten enterprises worked with the same innovation intermediary, which implemented an innovation community platform into a social network. Besides that, nearly all companies possess a brand community in the respective social network.

The key findings of the examined case studies show that (1) innovation communities possess better design skills than brand communities and (2) brand communities have a higher loyalty to the brand/company than innovation communities. Based on these findings, a conceptual approach was developed which illustrates how to include the aforementioned online communities in each stage of a new product development process.

The Impact of Incentive Preferences on Crowd Behavior

Contests and Crowdsourcing - Full Presentation

Johann Füller, Katja Hutter, Christoph Riedl

Inspired by recent technology advances, attempts have been made to leverage online platforms to solicit creative contributions towards the solution of social problems. However, it is unclear how heterogeneous incentive preferences coupled with a prosocial goal, may affect consumers' contribution behavior. The aim of this paper is to study consumers' creative contributions to a public good under varying monetary and non-monetary incentive regimes. We use data from a field experiment in which 918 participants self-selected their preferred incentive from five monetary and non-monetary options coupled with demographic data to predict consumers' field contributions. We find significant preference heterogeneity, with 64% of consumers preferring non-monetary incentives. Furthermore, these non-monetary incentives were very effective in soliciting active participation, leading, in certain contribution categories, to more consumer contributions than monetary-incentives. Overall, we find vastly different contribution patterns with regard to the type, number, and quality of creative contributions made by consumers. We find that contribution patterns are strongly related to consumers' preferred incentive, individual characteristics, and the contest dynamic. Our results make important contributions to our understanding of consumer behavior processes, as we show how these factors result in distinctly different contribution patterns, which are important in sustaining contribution to public goods.

Leaps in Innovation: The Effect of Discontinuous Progress in Algorithmic Tournaments

Contests and Crowdsourcing - Full Presentation

Joel Wooten

This paper explores whether innovation breakthroughs stimulate or impede future progress in individual innovation. On the one hand, one could argue that substantial improvements to the status quo might inspire advances through competition. On the other hand, one could claim such improvements might have the opposite effect, stifling motivation or creativity in rivals. Using a unique data set of predictive modeling contests from Kaggle we analyze 25,898 distinct attempts at innovation. We address two related questions to frame our central theme: (1) What effect do discontinuous leaps (as opposed to incremental steps) in innovation contests have on future progress? (2) What predicts such discontinuous leaps in innovation contests? The answers to these questions are as follows. Behavior after discontinuous leaps differs from behavior after continuous steps in innovation tournaments. We find that leaps result in increased rates of entry submission early in contests and improved scores going forward. For the second question, the entrant characteristics that predict leaps turn out to be somewhat different than those that predict steps. While more entries and bigger teams increase the likelihood of any improvement, steps are more likely with bigger teams, bigger prizes, and higher prior scores. Discontinuous leaps are not predicted by prize amount or prior success. This paper contributes new understanding to the literature on innovation tournaments and offers managers guidance about how to foster leaps in innovation.

Participation dynamics in crowd-based knowledge production: The scope and sustainability of interest-based motivation

Contests and Crowdsourcing - Full Presentation

***Henry Sauermann** , Chiara Franzoni*

Crowd-based knowledge production is attracting growing attention from scholars and practitioners. One key premise is that participants who have an intrinsic "interest" in a topic or activity are willing to expend effort at lower pay than in traditional employment relationships. However, it is not clear how strong and sustainable interest is as a source of motivation in crowd-based knowledge production. We draw on research in psychology to discuss important static and dynamic features of interest and derive a number of research questions regarding interest-based effort in crowd-based projects. Among others, we consider the specific versus general nature of interest, highlight the potential role of matching between projects and individuals, and distinguish the intensity of interest at a point in time from the development and sustainability of interest over time. We then examine users' participation patterns within and across 7 different crowd science projects that are hosted on a shared platform. Our results provide novel insights into contribution dynamics in crowd science projects. Moreover, given that extrinsic incentives such as pay, status, self-use, or career benefits are largely absent in these particular projects, the data also provide unique insights into the dynamics of interest-based motivation and into its potential as a driver of effort.

Is the World Flat? Unpacking the Geography of Crowd Capital

Contests and Crowdsourcing - Full Presentation

Yannig Roth, Jean-François Lemoine, Prashant Shukla, John Prpic

How does the geographic location of individual crowd members effect crowdsourcing participation and outcomes? How do variations in contest design effect crowdsourcing participation and outcomes by country and region? In this work we begin to answer these important questions by empirically testing the effects of geography and contest design on crowdsourcing participation and outcomes. Using data from a global creative crowdsourcing site, we utilize Crowd Capital Theory with data encompassing 1,858,202 observations from 28,214 crowd members on 94 different projects, to test our hypotheses based on the premise that the crowdsourcing is – much like the real world – not a flat one. Using multiple probit regressions to isolate the geographic effects, we find significant variation across countries and regions on crowdsourcing participation and outcomes, and further, significant effects of contest design on participation and outcomes by country and region. Our work makes new and useful contributions to the literature on crowdsourcing and creative competitions used for open innovation, ascertaining that the world is still not flat — even in case of tournaments on IT platforms with global reach. This is also the first work to empirically measure the distinct stages of resource creation from IT-mediated crowds; in doing so we validate Crowd Capital Theory as a model for resource creation from IT-mediated crowds.

Crowd-Based Sourcing — Global Search and the Twisted Roles of Consumers and Producers

Contests and Crowdsourcing - Full Presentation

Robert M. Bauer, Thomas Gegenhuber

Crowd-based sourcing is a fast growing way of outsourcing work: a 'call' is broadcasted to a large crowd; subsequently the respective task is outsourced to one, a few or many selected responders. We propose a coherent set of necessary and sufficient conditions, under which crowd-based sourcing occurs. Crowd-based sourcing creates value by enabling 'global search', thereby tapping into access capacities at the margins of the work realm and channeling them towards production. Provision and utilization of these access capacities are intimately tied to a broader societal trend that twists the roles of consumers and producers: leading towards 'working consumers' and 'consuming producers', and shifting (bargaining) power towards the latter. In addition, some producers stage 'crowd-based sourcing' to disguise their traditional marketing approach for bringing consumers under control. We conclude by identifying topics for further research, most importantly three areas of collective action that can remedy potential injustice associated with crowd-based sourcing.

Using Crowds for Evaluation Tasks: Validity by Numbers vs. Validity by Expertise

Contests and Crowdsourcing - Full Presentation

Christoph Hienerth, Frederik Riar

Developing and commercializing novel ideas is central to innovation processes. As the out-come of such ideas cannot fully be foreseen, the evaluation of them is crucial. With the rise of the internet and ICT, more and new kinds of evaluations are done by crowds. This raises the question whether individuals in crowds possess necessary capabilities to evaluate and whether their outcomes are valid. As empirical insights are not yet available, this paper deals with the examination of evaluation processes and general evaluation components, the discussion of underlying characteristics and mechanism of these components affecting evaluation outcomes (i.e. evaluation validity). We further investigate differences between firm- and crowd-based evaluation using different cases of applications, and develop a theoretical framework towards evaluation validity, i.e. validity by numbers vs. the validity by expertise. The identified factors that influence the validity of evaluations are: (1) the number of evaluation tasks, (2) com-plexity, (3) expertise, (4) costs, and (5) time to outcome. For each of these factors, hypotheses are developed based on theoretical arguments. We conclude with implications, proposing a model of evaluation validity.

Does Collective Intelligence Create More Biases Than Experts? Evidence from Wikipedia and Britannica

Contests and Crowdsourcing - Full Presentation

Shane Greenstein, Feng Zhu

A number of scholars have raised the concern that collective intelligence may give rise to biased or extremely opinionated content online as consumers could self-aggregate based on their own ideologies. We empirically evaluate this possibility by examining content bias from two different production models: an open production model based on collective intelligence that Wikipedia uses and an expert-based model that Britannica uses. Using a matched sample of political articles on Wikipedia and Britannica, we show that Wikipedia articles are more biased than Britannica overall but are less biased on a per word basis. We also find evidence that the revision process helps mitigate the content bias: slanted Wikipedia articles tend to come closer to their Britannica counterpart as they become more revised. These results suggest that collective intelligence does not appear to aggravate content bias online.

Performance Responses To Competition Across Skill-Levels In Rank Order Tournaments: Field Evidence and Implications For Tournament Design

Contests and Crowdsourcing - Full Presentation

Michael Menietti, Karim Lakhani, Kevin Boudreau

Tournaments are widely used in the economy to organize production and innovation. We study individual contestant-level data on 2,775 contestants in 755 software algorithm design contests with random assignment. Precisely conforming to theory predictions, the performance response to added contestants varies non-monotonically across contestants of different abilities; most respond negatively to competition; highest-skilled contestants respond positively. In counter-factual simulations, we interpret a number of tournament design policies (number of competitors, prize allocation and structure, number of divisions, open entry) and assess their effectiveness in shaping optimal tournament outcomes for a designer.

Does God play dice - Randomness vs. deterministic explanations of crowdsourcing success

Contests and Crowdsourcing - Full Presentation

Nik Franke, Lettl Christopher, Susanne Roiser, Philipp Tuertscher

Which factors are responsible for the success of crowdsourcing tournaments? Current theorizing on crowdsourcing appears to assume that there is a deterministic relationship between factors such as the organization of the tournament, characteristics of the participants attracted, and specific situational factors on the one hand and the quality of their contributions gained on the other. Based on theory that views creativity as a process of blind variation and retention, we introduce the alternative idea that in fact the quality of any participants' idea is largely random and thus the success of the tournament rests primarily on the number of participants attracted. In order to compare the explanatory power of randomness and 22 deterministic factors derived from literature we conducted a huge experiment in which 1,089 participants developed ideas for smartphone apps. Our finding is unambiguous: the single factor of randomness outperforms all deterministic explanations collectively by far. It appears that at least in crowdsourcing, God indeed plays dice.

Do Crowds have the Wisdom to Self-Organize? Field Experimental Evidence on Team Formation in a Crowdsourcing Contest

Contests and Crowdsourcing - Full Presentation

***Andrea Blasco*, Kevin Boudreau, Karim Lakhani, Michael Menietti, Christoph Riedl**

Organizing workers into teams is a dominant model for knowledge production and economic activity. Typically the "visible hand" of management takes a leading role in creating teams. Here, we deploy a field experiment to investigate the capacity for workers in online crowds to self-organize into teams to create solutions to an algorithmic scientific problem within a tournament framework. The "self-organizing" of online crowds—or workers,—into teams is a non-trivial problem of coordination and matching, in a context in which other parties are simultaneously competing for partners. We compare matching outcomes and performance to those in a comparison group in which we eliminate the coordination and matching problem altogether by directly assigning individuals to Pareto efficient teams. Self organization by the crowd does remarkably well relative to the benchmark achieving 13% more functioning teams. Teams also tended to be more effective on a number of relevant participation and effort dimensions. Conditional on having formed, self-organizing teams also benefit from several advantages in solution performance. Hence we show an inherent ability of crowds to self organize and coordinate action to solve scientific and technical challenges.

Inducing Change with an Online Ideation Game

Contests and Crowdsourcing - Full Presentation

Christian W. Scheiner, Katja Kraemer, Kathrin Moeslein, Kai-Ingo Voigt

Companies have to adapt to changes if they want to stay competitive. Change is, however, a highly complex and difficult task, especially when individual beliefs, knowledge, and routines rather than organizational structures are addressed. Despite the importance of this aspect, research on concrete measures is still underrepresented. Hence, within the present study, online ideation games are examined as means to change. Online ideation games are a sub-form of idea competitions, in which game mechanics are embedded to foster especially motivation and creativity. Online ideation games are in general perceived as a valuable tool to assess the knowledge and creative potential of people within and outside the boundaries of an organization. Existing research indicates, additionally, that their usage can also result in further benefits. However, prior research has not examined online ideation games as a means to change. In order to analyze its role in this context, the aim of this study is twofold. Firstly, to explore whether participation in an online ideation game can foster change on an individual level and, secondly, whether gender differences exist.

A longitudinal, quantitative approach was chosen to detect changes over time. An adjusted opinion leadership scale of Childers (1986) was used as a proxy to measure change on an individual level. The opinion leadership scale reflects the self-perception of individuals within their social environment towards specific topics with respect to their own proficiency and social role. As research object the online ideation game EVOKE has been chosen, in which societal challenges (esp. food security, power shift, water crisis, the future of money, empowering women, urban resilience, indigenous knowledge, crisis networking) are addressed.

The findings of this study show that the self-assessment of proficiency towards covered topics both increases and decreases. The self-assessment towards power shift, future of money, and empowering women decreased, while all other social challenges with exception of urban resilience showed an increase in the opinion leadership measurement. Thus, participants in the latter topics perceived themselves as more competent and in a more active role during the discussion and the conversation with others. Participants have subsequently undergone learning and unlearning. Male participants are furthermore more influenced by the participation than female participants.

Taking the eyes off the prize: Recreational labor in innovation contests

Contests and Crowdsourcing - Full Presentation

Benedikt Langner, Tomas Enrique Farchi, Victor Seidel

Firms pursuing an open innovation strategy have increasingly turned to individuals as sources of new ideas through the use of online communities or innovation contests, but firms often struggle to sustain the participation of participants. We conducted fieldwork at two firms that have successfully run community-based innovation contests for many years—Chicago-based T-Shirt firm Threadless and Phoenix-based automotive firm Local Motors—drawing on over ninety interviews, six months of on-site observation, and archival data. Our inductive results demonstrate how these firms turn activities that have been traditionally regarded as work into a recreational activity. We describe the design of innovation contests that attract people with intrinsic disposition and then elicit their intrinsic motivation to participate. We provide implications for this model of open innovation and the use of recreational labor.

Opening the Black Box of "Not-Invented-Here": Attitudes, Decision Biases, and Behavioral Consequences

FI - Full Presentation

David Antons, Frank T. Piller

The Not-Invented-Here (NIH) syndrome describes a negative attitude towards knowledge (ideas, technologies) derived from an external source like e.g. users and customers. NIH potentially is one of the most cited constructs in the literature on knowledge transfer as well as innovation, and also is a common phrase in management practice. Previous research, however, exhibits an abundance of different conceptualizations of NIH, and no clear understanding of its antecedents, underlying attitudes, and behavioral consequences. Building on recent research in psychology, an extensive review of the management literature on NIH, and a review of empirical studies focused on NIH, this paper contributes to a better understanding of NIH. We develop a framework of different sources classifying knowledge as "external" which might trigger a general, attitude-based rejection of such knowledge inputs, irrespective of their specific value. Differentiating various functions of an attitude, we identify possible trajectories linking NIH with individual behavior and decision-making. We apply this understanding to develop an extensive agenda for future research.

Absorptive capacity for need knowledge: An empirical study of its relation to technical knowledge and its consequences for innovation behavior

FI - Full Presentation

Tim Schweisfurth, Christina Raasch

Innovation happens if knowledge about technologies and about their application context are combined. That is information about solutions and about needs have to be collocated inside the organizational boundaries. Organizational scholars have argued that firms need to develop a capacity to identify, assimilate, and apply external knowledge. Until now, we have a thorough understanding about the antecedents, consequences, and microfoundational roots of such an absorptive capacity for external technological knowledge and solutions (S-ACAP). Yet, we lack theoretical understanding of how employees in firms absorb external knowledge about needs (N-ACAP).

We contribute to filling this gap by exploring which antecedents foster employees' absorptive capacity for need knowledge and how such a capacity interacts with S-ACAP to foster individual innovative performance. With respect to the antecedents of N-ACAP, we expect that N-ACAP is predicated on individual need knowledge, individual solution knowledge, and the interaction thereof. With respect to the outcomes of N-ACAP, we expect N-ACAP, S-ACAP, and their interaction to be positively related to individual innovative performance.

We test our hypotheses in a sample of 864 employees in a large European manufacturer of home appliances. We show that N-ACAP and S-ACAP are distinct concepts, not just theoretically, but also empirically. With respect to the antecedents of N-ACAP, we find significant positive effects of need knowledge, solution knowledge, and their interaction on N-ACAP. With respect to individual innovative performance as outcome, which we measure with a self-reported measure, a judge-rated measure, and a combination thereof, we get mixed results. We find full support in all three cases that N-ACAP is positively related to innovative performance. However, the moderating effect of S-ACAP on this relationship is significant only for self-reported and combined innovative performance.

Our study contributes to the literature on innovation in several ways. We introduce N-ACAP as a mechanism that explains how external need knowledge is identified, assimilated, and applied for innovation. This shifts the focus of our theoretical understanding from a more technological view on innovation to one that acknowledges that the that absorption of needs is crucial for firms. Further, we explore the antecedents and consequences of employees' N-ACAP, contributing to both to our understanding of individual level ACAP in general and to our emerging knowledge about N-ACAP. By researching the interplay between N-ACAP and S-ACAP, we also contribute to the literature investigating the interactions between marketing and technological capabilities. Finally, we also contribute to the literature on how firms can harness manage demand-driven innovations that are initiated outside the firm.

Co-Creation from a Telecommunication Provider's Perspective: A comparative study on innovation with customers and employees

FI - Full Presentation

***Milica Sundic**, Karl-Heinz Leitner*

During the last years a number of co-creation approaches and techniques have been proposed for supporting the innovation process. These range from traditionally organized ideation workshops within an organization, to implementations of open innovation methods which allow the involvement of various external and globally distributed partners. Particularly in dynamic and emerging industries, innovation seems necessary, and both closed and open approaches are applied. This paper conducts an empirical study on idea contests with customers and employees of a large telecommunication provider in Austria and contributes to the literature by providing insight into commercial feasibility of ideas, their origin and likelihood, as well as social media tools that support community building during co-creation. We discuss the importance of lead users and idea-sponsors and find evidence for offline community building and aspects that support organizational crowdsourcing.

How to manage the quantity and quality of idea in a co-creation community: The case of recipe site

FI - Full Presentation

Kei Aoki*, *Susumu Ogawa

Due to the penetration of information and communications technology (ICT), users are no longer merely consumers but have become value generators. In this paper, we examine how incentives impact on co-creation community participants. This study compares such two user-generated content (UGC) recipe sites as COOKPAD, the largest site in Japan, and Rakuten recipe, similar UGC site but added monetary incentives. Using the data from an online survey, the 1,000 participants of consisted of COOKPAD-only users (N=600), Rakuten-only users (N=200), and dual users (N=200), we found that a monetary incentive had a significant positive impact on the quantity of ideas and contributions and that its effectiveness increased when accorded with the evaluations of others. Furthermore, we found that as people contribute to the community they enhance their own abilities linked to idea quality. This paper demonstrated empirically how to manage the quantity of ideas and contributions and the idea quality in a co-creation community with data from actual co-creation participants.

Magnetic Control: Firms Managing Non-Contractual Relations with Open Source Communities

FI - Full Presentation

Maha Shaikh

Our qualitative in-depth case study work focuses on opensourcing and how companies over time have learnt to recognize and resolve challenges that emerge through their interaction with communities. The difference in incentives and authority structures means that companies need to improvise tactics for normalizing open source work within their own company. Through a study of the challenges and different tactics employed by companies we elaborate on the more subtle form of control exercised by them over the community members, the process of open source development, and the product (code). Drawing on Adler and Borys' ideas of coercive and enabling authority we position our dual contribution as; a) a detailed discussion of the key challenges that companies have to face when adopting and working with open source, and their matching tactics; and b) an elaboration on the magnetic form of authority that emerges to exercise more subtle control over the community. The latter, we find, is a subtle and particular form of hybrid control that has emerged in company and community co-creative interaction. This work has implications for understanding and establishing control and authority structures between more traditional commercial organizations and external new organizational forms. Theoretically this paper contributes to work on control and the process of how new control structures emerge over time through an elaboration of our ideas on the two elements of magnetic control – pull and generative.

Expert users' creativity meets complex product and process constraints – a case study of Tetra Pak's challenge "Can you fold it?"

FI - Mini-Talk

Lars Bengtsson

Expert users may provide the firm with new perspectives and knowledge diversity enabling the firm to innovate products and processes. However, a well known problem with engaging outside expert users is that most of their creative proposals are impossible to implement for the firm due to different constraints. Few and easy to communicate constraints might be relatively easy to handle. But what do you do if there are more than 50 product and process constraints and some of them hard to communicate? Is it still viable to involve outside expert users? How do you preserve expert users' creativity with such an amount of constraints? How do you organize the involvement of expert users under such circumstances? Could ideas and proposals from outside expert users result in innovations for the firm under these circumstances?

These were some of the questions when the global market leader in food carton packaging, Tetra Pak, decided to launch a global challenge "Can you fold it?" in order to find expert users to help Tetra Pak to come up with a new and better bottom fold in one of its present packages and ideas for new packaging products.

The challenge was primarily focused towards three groups of experts believed to be in a good position to solve the problem and to come up with new folds: origamists, industrial designers and professional mathematicians. The challenge was distributed world-wide to society's of origamists, schools of industrial designs and mathematics departments at universities.

Of the entries in the challenge ten people were chosen to work intensively on folding solutions in two workshops of two days each in Lund, Sweden. Four were experts on origami, four on industrial design and two on mathematics. It was an international group of two from the US, two from UK, two from Sweden, and the one person from Brazil, Singapore, Spain and Israel. Only one of the participants had worked with carton packaging before.

The workshop process

The poster will describe the workshop process which follows a format of going from more or less free folding (using a standard paper in a cylinder shape) of a cylinder bottom to adding more and more constraints for the fold. While some folding was done individually most of it was done in teams of two, five or the whole group. The framing before and between workshops also played an important role. The handling of the IP and the rewards for the group will also be described in the poster.

The result

The last workshop was performed in beginning of April 2014. The results as validated by five Tetra Pak engineers involved in the workshops are (May 2014):

- 5 new folds meeting the constraints set up by Tetra Pak
- 1 of the folds now tested in a packaging machine
- about ten new packaging designs, whereof one could directly be applied in customer specific development project.
- a network of ten folding experts.

Are You Ready for Open Innovation? Readiness for Change and Individual Knowledge Absorption

Firms' Interactions - Mini-Talk

Wolfgang Gruel*, *Ihl Christoph

The ability to integrate external innovation ideas is crucial for Open Innovation but often seems to be challenging. This study analyzes how readiness for open innovation on an individual level influences knowledge integration. It adapts the concept of Readiness for Change to the Open Innovation context. To test our hypotheses on the influence of readiness for Open Innovation, we conducted a large-scale empirical study (n=3755) within a multinational company. First results show that readiness for Open Innovation has a significant impact on knowledge transfer and preferences.

Producer-centrism: the inherent disregard of user innovativeness in new product development

FI - Mini-Talk

Philip Bradonjic, Nik Franke, Christian Lüthje

Imagine the following situation: you are sitting in a hairdressers' salon waiting for your just dyed hair to dry. In the meantime you read the description on the back of the color packaging. Thanks to your chemical background an idea for an alternative, possibly more effective color composition comes to your mind. As you express your thought to the hairdresser, he merely replies "You have no idea what you are doing. Let the experts do their work." Comparable views revealing a disregard for user innovativeness have also been observed in organizational contexts like architecture and engineering. Such an employees' world view hence appears to be a phenomenon occurring in a range of settings. Thus, the aim of the present research lies in examining this repugnant position in more detail to pinpoint in which areas it is more or less prevalent and to identify its antecedents.

In a first step from a psychological point of view, this depreciative stance can be categorized as a belief. Fishbein and Ajzen (1975, p. 131) refer to a belief as "a person's subjective probability judgment concerning some discriminable aspect of his world". This contrasts the related concept of attitude: "a person's general feeling of favorableness or unfavorableness toward some stimulus object" (Fishbein and Ajzen, 1975, p. 216). In other words, an attitude expresses a person's liking or disliking towards an object whereas a belief constitutes what a person holds to be true or false.

This distinction becomes crucial in a second step of differentiating the present construct from other already existing concepts in the organizational behavior and marketing literature such as the Not-Invented-Here Syndrome (Mehrwald, 1999; Lichtenthaler & Ernst, 2006), customer orientation (Kohli & Jaworski 1990) and market orientation (Narver and Slater, 1990). Besides other distinctive aspects regarding the locus of analysis and target, these notions tend to primarily consider behaviors or attitudes rather than beliefs.

Furthermore, a preliminary literature review found merely scarce research focused on employee's beliefs and their position towards open and user innovation.

Therefore, the present study aims to fill this gap by defining and testing this world view. An initial conceptualization has identified two dimensions – ability and quality -, which in turn can be expressed in two ways. The employee may think of himself to be superiorly skilled to innovate and to produce ideas of higher quality. Vice versa, the employee could also believe the user to be unable to generate new ideas and to create only futile input. A fear of incurring negative consequences for themselves such as losing control and job security when accepting users' contributions could further aggravate such a position.

Overall, the strength of these beliefs will likely be affected by several factors such as the type of user and staff concerned as well as organizational aspects like firm-culture, incentive systems previous experience with open and user innovation and the current integration user feedback.

Where do entrepreneurs locate their new ventures? The role of downstream localization economies, pre-entry experience and product/market strategy

FI - Full Presentation

Pamela Adams*, *Franco Malerba*, *Roberto Fontana

This study examines the influence of developments on the demand side on the location decisions of new entrants in an industry. Specifically we explore the effect of three factors: localization economies related to both the focal industry and downstream, user industries, the pre-entry experience of the entrants (spinoffs and user-industry spinouts), and the product/market strategies adopted at entry. We develop and test a set of hypotheses regarding these choices on a sample of 413 new entrants in the U.S. semiconductor industry between 1997 and 2007. Our results show that the relationship between localization economies and location decisions varies according to both the pre-entry experience of entrants and the product/market strategy adopted at the time of entry. We propose that the degree to which the initial capabilities of entrants match the demands of the focal market in which they enter influences location decisions. In particular, we find that spinoffs from the incumbent industry that enter markets that require advanced knowledge of user needs and applications are more likely to relocate in regions with a higher density of firms in downstream industries. Spinouts from downstream industries, by contrast, are more likely to relocate in regions with a higher density of firms in the focal industry. Our findings highlight that deeper analyses of both the initial capabilities of entrants and their product/market strategies are crucial for a full understanding of their location decisions.

Innovative Brand Community Members and Their Willingness to Share Ideas with Companies

FI - Full Presentation

Sladjana Nørskov, Yun Mi Antorini, Morten Berg Jensen

With the aim of contributing to the existing knowledge of brand community members and their willingness to share their ideas, in this paper, we investigate whether and how brand community innovators' 1) possession of lead user characteristics, 2) brand community identification, 3) brand knowledge, 4) brand loyalty, and 5) preferences regarding interference in community activities by the company behind the brand influence their willingness to share their ideas with the company. In contrast to earlier studies, which inquired into brand community members' intentions to share their ideas (Füller et al., 2008), we studied members who had already innovated and were actively involved in innovation processes.

Using a survey of the Adult Fans of LEGO (AFOL) community, which is comprised of adult LEGO hobbyists, we found that brand community members' willingness to share their ideas is positively related to lead user characteristics, brand community identification, and brand loyalty. Interference by the company in community activities also plays a role. Surprisingly, the brand community innovators perceive this role in the opposite way of what prior research within firm-hosted and open-source communities suggests. This study extends our knowledge of brand communities by demonstrating how brand community innovators' interpersonal contexts, personal traits, and brand perceptions may promote or demote willingness to share.

Not just Innovation: the emergence of the User-Dependent firm, the case of giff-gaff

FI - Full Presentation

Steve Flowers

This paper broadens the focus on the role of users in order to better understand the shifts in the way products and services are created and offered. It is now well established that a range of external actors may be enrolled by firms at various stages in both innovation and operation activities. This approach emphasises the shift in the locus of both innovation and operation from the firm alone, to the firm plus a collection of engaged outsiders, some of whom will be users (e.g. Boudreau and Lakhani, 2013).

This continues trends that have been evident for some time and it has long been recognised that innovation is driven by interactions with a wide range of actors beyond the traditional boundaries of the firm (e.g. Chesbrough, 2003). While the existing literature on inter-firm relations and innovation netorks offers useful insights about the barriers and enablers firms experience in managing their external interactions, collaborating with engaged outsiders throws many of these challenges into sharp relief, at the same time as creating entirely new ones. The recent literature on interactions across boundaries of practice highlights their provisional, negotiated, and open-ended nature, where the various participants attempt to build a shared context together (e.g. Hargadon and Bechky, 2006).

In order to explore the boundaries of working with non-firm actors this paper will explore the case of giffgaff, a UK-based mobile telecoms provider. Giffgaff, a subsidiary of Telefonica, is an example of a firm that was specifically intended to take advantage of user activity within its organisational design. In contrast to established firms that had to makes adjustments to their boundaries in response to spontaneous user activity, giffgaff was designed around such activity from the outset and is entirely dependent of users in order to operate. The case will provide the basis for an exploration of the characteristics of the User-Dependent firm and an initial profile of such a firm will be offered.

This case throws new light on our theoretical understanding of boundary issues in the context of the part(s) played by users in innovation and raises questions concerning the applicability of boundary practices observed in spontaneous user activity to more managed contexts. The paper will provide a brief historical perspective on users in invention and innovation, before going on to explore the increasing importance of non-firm actors in the creation of new goods and services. The firm giffgaff will also be introduced and the boundary conditions for their broad range of collaboration activities will be outlined. The paper will conclude with an initial agenda for future research in this area.

Boudreau, K. J., and Lakhani, K. R.. (2013) "Using the Crowd as an Innovation Partner." Harvard Business Review 91, no. 4: 61–69.

Chesbrough, H (2003) Open Innovation: The New Imperative for Creating and Profiting from Technology. Boston, MA, Harvard Business School Press.

Hargadon, A.B. and Bechky, B.A. (2006) When collections of creatives become creative collectives: a field study of problem solving at work. Organization Science 17(4): 484-500.

User-led Innovation: From a Firms' Lens on Current & Future Trends

FI - Mini-Talk

Nagwan Abu El-Ella, Andreas Pinkwart

How to involve users within the innovation process to develop and obtain more innovative outcomes with higher customer value in an efficient way is a widely discussed question in management literature and practice within the last 20 years. Today companies are applying diverse concepts, processes and methods to co-create with users to increase their competitive edge. This research examines the current state of user co-creation within innovation processes from an organizational perspective and identifies current best practices and emerging trends to involve users within the development of innovative products, services and businesses in both an effective and efficient way. Before discussing relevant theoretical concepts of user innovation the evolution of innovation concepts will be outlined and a basic innovation framework being applied within this research will be discussed. Since the early 20th century work of Schumpeter innovation has been identified and discussed as a major driver of value creation for companies and society (Schumpeter, 2003). Innovation can be defined as "process of turning opportunity into new ideas and of putting these into widely used practice" and can be divided into incremental innovation, as a process of continuous improvement, and discontinuous (also called disruptive or radical) innovation, where the commonly accepted market and rules are changed (Tidd & Bessant, 2009). The concept of discontinuous innovation corresponds with Schumpeter's concept of "creative destruction".

Increased competitiveness of today's markets has increased pressure to innovate (D'Aveni, 1998), driving the development of innovation concepts. These have evolved from simple linear models of technological development push and customer needs pull to more complex and networked models over time.

Newer concepts emphasize a more active role of customers and users in the creation of innovation and also current market research identifies customers as a major resource to gain competitive advantage through innovation (Peer, 2014). Thus we explore new concepts for co-creation between companies and users in the development of innovative products, services or business and show best-practices and trends based on the academic literature and expert interviews conducted. This is an ongoing explorative study based on expert interviews and literature.

Research on user innovation focuses on the conditions required to let users innovate, supporting factors and the utility gains by the user (Bogers & West, 2012). To explain why companies try to involve users as innovators, Vrande et al (2009) showed that the major motives are related to the market (keeping up with market developments, customers, increase growth and/or market share) or the innovation process (improved product development, process-/market innovation, integration of new technologies). On the other hand, users innovate if products on the market do not fully meet their requirements, i.e. if the required level of customization is not available on the market for the price the users are willing to pay (von Hippel, 2005).
Thus, user co-creation is an effective way to combine company vision and capabilities with the 'sticky knowledge' of users. Neither party can cover the required breadth for innovation alone but rather working together is a viable option for better innovative performance.

Antecedents to selective revealing: An empirical study in non-OSS environments

Firms' Interactions - Mini-Talk

Markus Deimel

Knowledge constitutes a crucial resource in competition. Simultaneously, innovation is increasingly shifting from closed and producer-centric towards open and user-centric processes (von Hippel, 2005). In such an environment the revealing of knowledge to the outside may be a viable strategy, e.g. through the induced cooperative behavior (Alexy, George, & Salter, 2013). However, when the knowledge is of value, why reveal it for free in the first place? This poses a significant dilemma for the focal firm. Various examples exist and have already been studied:

- Once a fenced garden, IBM makes parts of their patented technologies freely available to the outside world (IBM, 2009).
- Novartis reveals insights from a large medical study on the DNA-causes of diabetes for free (Pincock, 2007).
- Company scientists present their research to the scientific community and publish it in academic journals (Simeth & Raffo, 2013).
- Even more, the sharing of valuable knowledge and information seems common between users and firms as well as among competitors (e.g. Allen, 1983; Harhoff, Henkel, & von Hippel, 2003; Henkel, 2006; Schrader, 1991).
- Yet other firms, e.g. Apple, hide their research behind "berlin walls".

This PhD project therefore aims to investigate the following research question: "Under which circumstances are firms more or less likely to engage in the selective revealing of knowledge?"

The study of the antecedents of selective revealing activities will be empirical. In a first step, a review of current literature identifies the state of the art. The project shall contribute to the growing, yet still scattered literature on outbound open innovation and the non-pecuniary revealing of information (Dahlander & Gann, 2010). The envisioned quantitative design and a setting outside the area of open source software should enrich our understanding of the phenomenon as called upon by Henkel, Schöberl, & Alexy (2014).

The project is in an early stage and welcomes feedback on the relevance of the research question, the theoretical underpinnings of preliminary hypotheses and research design.

The Influence of Psychological Ownership on Entrepreneurial Activity of Users

Firms' Interactions - Mini-Talk

Wayer Dennis

It has been of central interest why users innovate at all, why they share and exchange innovation. Authors have looked at such motives, for instance, in the field of open source software. Furthermore, motives have been investigated in studies that look at industry development and the role of users in the commercialization process of innovations when they bridge gaps of development that manufacturers do not take.

Yet, other studies have looked at user community innovation processes in physical products and investigated motives why users share and exchange information. Among the common motives why users innovate and share their knowledge are personal use benefits, enjoyment of the innovation process, altruism, helping others and sharing, signaling, and learning from the innovation process. While these motives have been tested in several empirical settings of user innovation, an important set of motives is yet missing: the feeling of psychological ownership.

Psychological Ownership might well explain, what encourages users to become entrepreneurial after developing innovations. It might also help to better understand 1) why users keep innovating independent of manufacturers (in cases in which they innovate in completely novel fields) or 2) why users as employees do not mind letting go of their IP and freely sharing their innovations with their employers.

Although the concept of psychological ownership has been applied in social science and organizational behavior, it has not been considered in user innovation and entrepreneurship in general. Research in user innovation investigated several processes that lead to similar motivational, attitudinal and behavioral effects and outcomes of psychological ownership. However, research struggles to explain why some users pursue innovation and become entrepreneurial whilst others don't. From research in the field of organizational behavior we know that characteristics of ownership are proposed to promote psychological ownership, by providing (a) control (b) extensive knowledge, and (c) an opportunity for self-investment. Further, we know that when employees are also owners, their relationship with the organization is changed and this affects the way they think and behave.

We propose this is similar in user innovation, where users with higher feeling of ownership will have a higher level of motivation to participate in innovation and a higher willingness to share their ideas and become entrepreneurial. Furthermore, one can argue that users who are highly active aim to satisfy the four motives (self-identity, effectance, home, stimulation) which found the basis for psychological ownership and which in turn might be latent conditions for user innovation to happen at all.

Knowledge revealing in Open innovation – key dimensions and reciprocity

Firms' Interactions - Full Presentation

Saumya Amarasinghe*, *Kenneth Husted*, *Frank Siedlok

Free knowledge disclosure – or revealing – is an innate aspect of the increasingly popular, both in academia and in practice, Open Innovation (OI) model. However, the concept remains under-researched and its understanding fragmented, hindering further theory building. We critically review literature on revealing in the context of OI published over the last 10 years, with special consideration being paid to, first, the scope and levels of revealing, and, second, reciprocation dynamics. As a result, based on different expectations of involved parties, four modes of revealing are being proposed: reverse reciprocation, mandatory reciprocation, anticipated reciprocation and uncertain reciprocation. We believe that these findings would be pertinent as foundational work to reshape the future empirical research on revealing that may further clarify the boundaries, reciprocal knowledge flows and revealing in general. Such clarification is required to build a coherent understanding on the phenomenon and to clarify the value creation process.

User driven innovation in electromobility: Applying netnography to identify leading edge users in a high-tech environment

Lead Users - Full Presentation

Pollok Patrick, Lüttgens Dirk, Frank T. Piller

Netnography i.e. the systematic observation and analysis of online communities to generate insights for an innovation process, has been established as a method of user innovation in consumer goods industries. In this study we apply this technique for the first time in the context of a complex, business-to-business high-tech industry, namely services and systems for electric vehicles, by analyzing 15 online communities in this domain. We find that Netnography can largely enhance the knowledge stock of a research organization in the area in question, and provides access to key individuals with lead user characteristics.

Antecedents and consequences of consumers lead userness: The case of mobile applications

Lead Users - Full Presentation

Henrik Sällberg, Lars Bengtsson

Lead userness (LU) captures to what extent a user, in a given product domain, is ahead of an important market trend and expects high benefits from innovating. A comprehensive understanding of antecedents and consequences of LU are important both to theory and practice. To lead-user theory, it can contribute by better being able to explain why some users display LU whereas others do not. Also, an improved understanding of consequences may help explain why users displaying LU provide advice to other consumers and often come up with attractive innovations. To practice, knowledge on the antecedents and consequences of LU may provide insights of how to identify these users at lower cost as well as how to get use of them in developing or promoting new products.

Previous studies have investigated different antecedents and consequences in different product domains. Therefore, there is a need to further investigate the previously studied antecedents and consequences. This way a more comprehensive understanding of the relative importance of different antecedents and consequences within and across product domains can be gained. In the current study we therefore set out to investigate three previously studied antecedents of LU: consumer knowledge, intrinsic motivation and extrinsic motivation. In addition we study a fourth antecedent, technology cognizance, which may be of particular importance in the information technology intense domain we study. Further, two previously studied consequences of LU, opinion leadership and opinion seeking, are researched in the present study of mobile applications.

Based on a survey study of 156 undergraduate students we report in a series of regression analyses: (1) consumer knowledge to be the only antecedent of LU; (2) opinion leadership and opinion seeking to be consequences of LU, the former being a relatively more important one, and; (3) Our findings to overall correspond highly to findings in researches of other domains ranging from extreme sports such as kite-surfing to the mass market of home kitchen appliances. Implications for research and practice are provided.

Exploring the functional sources of disruptive innovation

Lead Users - Full Presentation

Stephanie Preissner, Christina Raasch

Where do disruptive innovations come from? Extensive research investigates why large incumbents often fail to recognize the threat posed by disruptive innovations. Still, we yet need to understand where such path-breaking innovations originate. A better understanding of the sources of disruptive innovations will facilitate the ex-ante identification of potentially disruptive innovations.

Drawing on the literature on the functional sources of innovation, this paper analyzes the functional sources of disruptive innovation. Following latest research, we distinguish three functional innovators: users who innovate for use value; producers who innovate for profit; and participators who innovate for innovation process benefits such as learning, enjoyment and reputation. We advance several hypotheses explaining how the functional source of an innovation is related to its characteristics and hypotheses that relate demand-side and supply-side conditions of the market environment to the functional source of innovation.

To test our hypotheses, we built a dataset of 62 disruptive innovations. For each case of disruptive innovation we compiled, coded and analyzed extensive secondary data. In our sample, 43.5% of disruptive innovations originate from producers and 35.5% from users, while 21% are originally primarily process-motivated.

Our findings, in brief summary, are as follows: In terms of the characteristics of the innovation, we find that users are significantly more likely than producers and participators to be the source of process innovations, whereas, for product innovations, the reverse is true. Participators are more likely to create innovations involving radical technological change. They also tend to be the source of new market disruptions. Producers, by contrast, are more likely to develop low-end disruptions, i.e. cheaper products competing in the same performance dimensions as the incumbent product.

In terms of the market environment and its association with the functional source of innovation, we find that disruptive innovations are more likely to originate with users, if the environment is characterized by customer preference discontinuity. We find no significant differences between users, producers and participators with regard to innovation in environments characterized by technological discontinuities. Finally, we find that users are more likely than producers to innovate in environments with weak appropriability.

Our empirical investigation into the functional origins of disruptive innovations can contribute in three ways: First and most importantly, by advancing and testing hypotheses on the source of disruptive innovation, we reconcile and extend the literatures on user innovation and disruptive innovation. To our knowledge, this study is the first to connect these influential research streams. Second, it leverages the extensive literature on user innovation to inform the ex-ante identification of disruptive innovations. It can thus enhance the predictive power of the concept, which, according to a number of scholars, is not yet fully developed. Third, this study extends our understanding of the contingency factors favoring different functional sources of innovation.
Our findings can also inform managerial practice, particularly the ex-ante identification of potentially disruptive innovations. Our findings indicate that Christensen's concern that firms listening closely to their present customers will miss disruptive innovations is not always warranted and that more contingent thinking is required.

Lead Users characteristics: A study of online Lead Users detection

Lead Users - Full Presentation

Belbaly Nassim, Clémence Cheruy

This study contributes to our understanding of Lead users characteristics and by bringing attention to and investigating the difference between offline and online lead user's detection. This study is first to explicitly examine how lead users are detected from an online ideation contest. In contrast with previous studies, in which lead users were selected by firms and used during offline new product development processes, in this research the authors used an online crowdsourcing platform to detect lead users through their participation to an ideation contest.

We find that the main characteristics that underlie lead user's detection, namely, ahead of trend, consumer knowledge, and Expected benefits were confirmed to be the same for online and offline. However, we find that not all of these characteristics attributes are necessary to characterize an online Lead user.

Keywords: Lead user detection, ideation platform

How lead users develop and expand user communities sufficiently for producers to enter markets: A case study of masking tape usage innovation

Lead Users - Mini-Talk

Satoshi Horiguchi

Prior studies on user innovation have focused on user communities because they can provide a platform for community innovators to improve their inventions and diffuse them widely. Moreover, their reaction to a user innovation can help firms predict the market size and commercial attractiveness of the innovation. However, user communities do not always exist before user innovators innovate, particularly in the case of completely novel products.

This research aims to investigate how user communities arise and grow. A case study of masking tape usage innovation was conducted to explore its dynamic process. We interviewed user innovators who found a radical new use for industrial masking tape, and a producer which actually launched new business in cooperation with them.

The results reveal that lead users develop and expand a user community in various ways to a large enough degree that producers can enter the market. These results suggest that lead users not only freely reveal their innovations but can also trigger commercialization independently by creating demand and visualizing it. Our research additionally indicates that lead users in usage innovation can be found neither within the target market nor advanced analog markets because the performance dimensions evaluated in new usage can be utterly different from those of existing usages . This difference might increase difficulties for makers to adopt usage innovations unless lead users show the potential of the new market themselves.

Systematic Lead User Identification: Industrial Case Study Framework

Lead Users - Mini-Talk

Sanjin Pajo, Maka de Lameillieure, Paul-Armand Verhaegen, Joost R. Duflou

In a rapidly changing marketplace companies are constantly looking to meet customer needs and stay competitive by bringing new solutions to the market. A small subgroup of customers, called lead users, experience needs before the rest of the marketplace and stand to benefit greatly by finding solutions to those needs. They actively engage in innovation and are a great source of new and commercially successful ideas for companies. To identify such a valuable human resource, companies have utilized surveying approaches like broadcasting, screening, pyramiding and crowdsourcing. Although effective, these methods are often time and resource consuming: the identification process can last up to 6 months and experts are required to analyze vast amounts of user information collected in interviews or through questionnaires.

To systematically and quickly identify lead users, an approach utilizing data mining and machine learning methods to find lead users online, called Fast Lead User IDentification (FLUID), is proposed. Social networking sites like Twitter provide vast amounts of rich data through a structured interface and are suitable target platforms. In order to train the algorithm, a set of Twitter lead users and non-lead users was collected by utilizing a surveying approach. This set acts as a stepping stone that allows us to build an early classification model. The FLUID tool will be tested on a number of industrial cases executed in close cooperation with industrial partners. For each case, a set of keywords is requested from the company to be used as query terms for a lead user search on Twitter. In the next step, data collection, user metadata and tweets are retrieved through the structured interface. The amount of data collected depends on the company's specific needs. Additional filters may be applied, for example language filters, limiting the user group to a particular targeted subgroup. Thereafter, instantaneous classification is performed using the previously generated classifier model, which separates Twitter users into lead and non-lead users, and provides a confidence level score for each user's classification. This allows for the making of a ranked list of top lead users. To further improve the classification process and to tailor it to the needs of the industrial partners, the company representatives are asked to evaluate the metadata and tweets of lead and non-lead users uniformly picked from the ranked user list. For each of these users, the company indicates a novelty degree of ideas from lead and non-lead users and their interest in contacting the user for further collaboration in their product development process. The evaluated set of users is added to the training set to further improve the classification model. It is envisaged, that a number of iterations will be necessary in order to optimally rank the users according to the company's interest. Finally, the obtained set of lead users is validated through an idea evaluation process performed together with the company. The approach contributes to the lead user methodology by offering a systematic and fast approach to identifying lead users through social networking sites.

Implementation of lead users into management practice - An analysis in the German-speaking area

Lead Users - Mini-Talk

Jens Lehnen, Daniel Ehls, Cornelius Herstatt

By integrating lead users into the new product development process, external stakeholders' knowledge and creativity is utilized in order to reduce the inherent failure risk of market launches. Pioneering examples for lead user products which have been appropriated by firms are mountain biking, kite surfing or snowboarding. 3M, Johnson & Johnson or HILTI are iconic, often mentioned cases of companies successfully integrating lead users. Academic research on the lead user approach has been conducted for nearly thirty years. However, only few examples are frequently cited and hardly give insights on how the lead user approach is implemented in practice. Scientific publications rarely focus on the implementation of this approach into management practice. It is unclear whether the theoretical process is adopted consistently. Due to varying circumstances in practice, changes regarding the process are likely due to practical knowledge. The academic side can learn from these experiences and enhancements from practice and thus improve the lead user approach. It therefore is a matter of particular interest to analyze the actual implementation of lead users into management practice.

Exemplarily we analyze the German market and conduct a literature analysis of 255 publications in German-speaking business press. We identify gaps concerning the understanding and definition which challenge the implementation process. A detailed content analysis reveals inconsistencies especially regarding the utilized methods and processes. Furthermore, to specify our findings, we conduct an explicit case study analysis of 51 exemplary companies. We discuss the differences between scientific and practical understanding as well as the various approaches and methods within the cases and derive implications for both, theory and practice.

What Hinders The Application of The Lead User Method in Practice? Insights From The Field Of Innovation Management in Germany

Lead Users - Mini-Talk

Alexander Sänn, Philipp Schneider, Felix Homfeldt

The application of the lead user method in practice embraces several challenges. This working paper aims to deepen the understanding of the practical challenges and delivers insights from the marketing research and innovation service industry. The starting point for the argumentation on practical challenges is derived from the central question and examines 100 corporate members of the ADM and BVM lobby associations. The theoretical input for the study is derived from observations in several case studies and from contributions made by academic research. Overall, 18 statements were found in previous contributions. Overall, the results show surprising evidence of the existence of positive and negative prejudices that address the usage of the lead user method as a tool to perform innovation projects with clients. Controversially, the lead user method is able to provide valuable input in terms of unknown contributions and future needs, but faces its restrictions inside the company. It is further shown, that there is a gap between the evaluation of the lead user method by non-users and by the actual users of the method.

Disentangling Motives for Strategic Selective Revealing: An Empirical Analysis

Open Innovation - Full Presentation

Hannes W. Lampe, Ihl Christoph

Current theories for firms' selective revealing behavior postulate several reasons for their behavior. This paper investigates three related questions to selective revealing of information and knowledge by firms. The contribution of this study is threefold. First, we examine the effect of different innovation strategies on selective revealing motivation. Second, motivation factors for selective revealing are analyzed. By doing so we distinguish between commercial and non-commercial motivation factors of selective revealing. Third, we investigate the effect of selective revealing on external knowledge search and vice versa. For this purpose a quantitative study was conducted giving evidence that influential non-commercial motives for selective revealing are 'influencing external spillovers' as well as 'influencing market and competition'. Also commercialization aspects play an important role for firms' revealing knowledge. Firms that focus on an explorative innovation strategy are more motivated to disclose knowledge and firms focusing on an exploitative innovation strategy are less likely to reveal knowledge. Furthermore, we show that external knowledge search is strongly connected to selective revealing and vice versa.

An Evolutionary Model of Collaborative Short-Term Interactions on Innovation in Open Online Challenges

Open Innovation - Full Presentation

Albert Armisen, Ann Majchrzak

Organizations are increasingly expecting crowds to engage in online short-term collaborations to generate innovative solutions to complex organizational problems, referred to as Open Innovation Challenges. The assumption underlying Challenges is that innovation from these Challenges is more likely when the crowd is diverse because, as the online interactions surface diverse perspectives, new ideas are sparked, knowledge is recombined in new ways, and innovative solutions emerge. Industry experience suggests otherwise. Therefore, this paper examines the basic assumption underlying the diversity-to-innovation relationship. By combining conservation ecology theorizing about the role of diversity in ecosystem resilience and the management literature on the role of diversity in groups, we propose the notion of ecological diversity to explain the conditions under which diversity is likely to affect innovation. We test hypotheses derived from this proposal on data from an Open Innovation Challenge with independent assessments of innovation and find support for the notion of ecological diversity. Implications of ecological diversity on the use of crowds for innovation generation are discussed.

Open Innovation and Open Communities in Consumer 3D Printing

Open Innovation - Mini-Talk

***Joel West**, George Kuk*

Open innovation advocates that firms should look beyond their borders for sources of innovation. This may include other firms, universities, public research labs — or communities. Here we study 3D printing, and how MakerBot Industries leveraged open hardware and content to become a multimillion dollar firm based on selling closed source hardware, while nurturing its open online content community. Using a longitudinal case study design, we identify three distinct phases in how MakerBot created and nurtured the Thingiverse community as a free resource of user-created digital designs that could be printed as physical goods through its physical printers, both creating value for the community and demand for its products. We analyze MakerBot's ability to win community acceptance for its increasingly proprietary strategy, and offer broader implications for managing user communities, open hardware design and partly open platform strategies.

Organizing collaboration: The costs of innovative search

Open Innovation - Full Presentation

Kathleen Diener, Lüttgens Dirk, Frank T. Piller

Open innovation is a new understanding of how to acquire external knowledge, with the process being mainly characterized by unconventional forms of collaboration. There is a paucity of research investigating procedural differences in open innovation collaboration. How knowledge is transferred from outside of the company into the firm may be influenced by aspects of organizational structure, and causes differences in costs of coordination. Based upon a survey of innovation intermediaries, we analyze the costs of their knowledge transfer activities, with specific focus on the applied search mechanism. We find that variations in search behavior lead to different coordination efforts. Indirectly searching for information, in terms of broadcasting a problem and call for possible solutions, produces less coordination costs than directly searching and determining the breadth and depth of the desired search field. Furthermore, the extent of communication effort required to perform search, in comparison to the rest of knowledge transfer activities, informs us of how the information processing is configured. To organize collaboration, we find the first phase of knowledge transfer, initiation of collaboration, to be crucial. Our results demonstrate that depending on the search behavior, the collaboration process needs to be organized differently. In an indirect search behavior central information processing structures are beneficial, whereas in a direct search more decentralized information processing is most supportive.

Competing with open innovation on dynamic landscapes

Open Innovation - Mini-Talk

Mikko O. J. Laine

This is a brief abstract for a poster presentation at the Open and User Innovation Workshop 2014 on July 28-30 at the Harvard Business School. It offers a very recent and unfinished continuation to my previous work, which explored some of the contingencies of open innovation by computer simulations and was presented at the Open and User Innovation Workshop in 2012.

As general background, in complex and turbulent product environments characterized by intense competition and short product lifecycles, firms need to constantly innovate to sustain. The open innovation framework has been posited as an answer for firms to achieve a sufficient rate of successful innovations. However, previous research on open innovation has not yet fully integrated the effects of competitive dynamics nor explored how these effects change in dynamic environments. My research question thus is: How do fluctuating customer preferences and competitive dynamics shape adoption of inbound open innovation in complex product environments?

In this further research I investigate these complex dynamics by the aid of computer simulation, employing Kauffman's NKC-model of rugged fitness landscapes. Dynamic landscapes witness changing customer preferences by introducing decay into the fitness variables. Furthermore, multiple competing products from different firms struggle on the landscape to find highest fitness, concurrently affecting each other's positions. These multifaceted effects are modeled in numerous product and environmental configurations.

I have completed many simulations with variable conditions. Below are only two examples, in which product improvement by open innovation is simulated with different open innovation strategies at different product complexities in fitness landscapes that decay over time. I suspect the results of these and the other simulations could present avenues for fruitful discussions at the workshop's poster session.

Exploring the Multifaceted World of Ecosystems: Literature Streams and Recent Cases

Open Innovation - Mini-Talk

Monika Hauck

With managers paying more and more attention on the outside of the organizations, the recent two decades have seen an emergence of diverse literature streams on business ecosystems. In explaining the concept, some authors took a rather holistic approach and relied strongly on the ecological metaphor. Others have discussed and conceptualized the functioning and building parts of ecosystems more specifically and tried to bring first empirical insights. However, those authors mainly focused on ecosystems that function in the information and telecommunication technology industries - companies such as Apple, IBM, Intel and Microsoft - and primarily included actors which were driven by economic interests. After reviewing diverse streams of literature, we claim that there is no common understanding of business ecosystems in the management filed so far, and that the concept is often addressed in a very abstract way.

In the light of the most recent technological and societal developments, namely cases of disruptive innovation and rapid diffusion of the massive open online course (MOOC), crowd engagement in the missing Malaysia Airlines plane search, and the emergence of Berlin startup scene, we argue that the ecosystem concept, its application and supporting literature should be revised and that additional literature streams could enrich ecosystem discussion and practical understanding. We find that creative individuals, power of crowds, and culture should serve as additional units of ecosystem analysis, and that aspects such as the role of industry clusters, geographical and virtual hubs, and the changing role of capital, can add a new perspective to the understanding of the ecosystem concept. We thus refer to the open and user innovation, cluster, and platform literature to add up important factors for the regional, social, crowd source and industry specific aspects. Furthermore, we draw on literature around entrepreneurial ecosystems and venture capital in order to further investigate the role of individual actors and the role of capital.

Effects of Open Innovation on Value Creation and Value in Multi-Sided Market

Open Innovation - Mini-Talk

Margherita Pagani, Benassi Mario, Scheid François

Purpose of the paper – Multi-sided markets are emerging as composed of platform owners and two or more distinct user networks that either buy or sell applications for the platform. In the context of the video-game industry this paper explores how open innovation allows for different possible ways of creating and capturing value.

Design/methodology/approach – Using a framework based on the role of Multi-sided platforms in open innovation, this study analyses a profile of early open innovation platforms and the effect on value creation and value capture in the video game industry based on collected data from secondary sources.

Findings – Open innovation lowers entry barriers, increases access to funding, reduces control over developed products by publishers and console manufacturers. It also reduces time-to-market processes, while increasing ability to meet customers' needs thanks to co-creation processes.

Research limitations/implications – Future research should continue to examine newly launched open innovation initiatives comparing different multi sided markets to understand the trends of open innovation practices over time.

Practical implications – With an increasing importance of the role of customer, in the open innovation model, companies have to move from a content gatekeeper position towards a platform gatekeeper position and therefore a customer gatekeeper position.

Originality/value – Where the majority of work examining open innovation addresses property rights, economic rationales, governance, and processes, this work is the first to focus on the effects of open innovation on value creation and capture in multi-sided markets.

The 3D Printable: Private-Collective Innovation in Open Design

Open Innovation - Mini-Talk

George Kuk

Despite the depiction of the private -collective innovation model as combining the best--of--both--worlds (von Hippel and von Krogh 2003), the act of freely revealing intellectual property as a public good is seldom sufficient to sustain continuous contribution. This paper aims to reconceptualize private-collective innovation as the creation of common-pool resources, which are subject to the subtractability of resources, and that can lead to collective inaction. It puts private-collective innovation in the context of open design to explore the cyclical relationship between subtraction and contribution among different actors in an online design community. Specifically, the ways user entrepreneurs strategically balance between contribution and subtraction not only to mitigate the liabilities of newness and smallness but also to signal their ability as a lead user-designer to both their peers and buyers in the 3d markets.

Wisdom or Madness? Comparing Crowds with Expert Evaluation

Crowdfunding - Full Presentation

Ethan Mollick

In fields as diverse as technology entrepreneurship and the arts, crowds of interested stakeholders are increasingly responsible for deciding which innovations to fund, a privilege that was previously reserved for a few experts, such as venture capitalists and grant-making bodies. Little is known about the degree to which the crowd differs from experts in judging which ideas to fund, and, indeed, whether the crowd is even rational in making funding decisions. Drawing on a panel of national experts and comprehensive data from the largest crowdfunding site, we examine funding decisions for proposed theater projects, a category where expert and crowd preferences might be expected to differ greatly. We instead find substantial agreement between the funding decisions of crowds and experts. Where crowds and experts disagree, it is far more likely to be a case where the crowd is willing to fund projects that experts may not. Examining the outcomes of these projects, we find no quantitative or qualitative differences between projects funded by the crowd alone, and those that were selected by both the crowd and experts. Our findings suggest that the democratization of entry that is facilitated by the crowdfunding has the potential to lower the incidence of "false negatives," by allowing projects the option to receive multiple evaluations and reach out to receptive communities that may not otherwise be represented by experts.

Agent Heterogeneity in Two-Sided Platforms: Superstar Impact on Crowdfunding

Crowdfunding - Full Presentation

Anil Doshi

How do differences amongst agents on one side of a two-sided platform affect the transaction behavior of agents on the other side? In this paper, I focus on the arrival of high-performing superstar agents and their impact the other side of the platform. In the context of crowdfunding, I demonstrate that the arrival of superstars increases the overall transaction volume on the platform relative to other platforms (in what I call a halo effect), and that the relative increase is disproportionately experienced by agents that are similar to the superstar (crowding in effect). The results in this paper suggest in addition to pricing and platform structure, platforms may focus on attracting agents with high success potential to create competitive advantage.

The Due Diligence of Crowdinvestors: Thorough Evalution or Gut Feeling Only?

Crowdfunding - Full Presentation

Christina Guenther, Christoph Hienerth, Frederik Riar

This paper presents a first attempt to empirically examine the due diligence of crowdinvestors. We investigate different kinds of evaluation, crowdinvestors apply to make investment de-cisions and whether the investment amount reflects the thoroughness of the due diligence process of crowdinvestors. We find that crowdinvestors utilize important aspects of thorough evaluations (i.e. expertise, experience, and effort) and that these aspects are associated with the investment amount. This empirical examination is based on unique survey data gathered from a major European crowdinvesting platform.

Crowdfunding: a new driver of user innovation

Crowdfunding - Mini-Talk

Sara Jane Gonzalez, Jing Shao, Debora Bettiga

Crowdfunding has emerged as an innovating way of funding for individuals and companies, alternative to traditional fund-raising and centered on user innovation. It represents a new business model designed to support the entrepreneurial spirit from those who have innovative ideas, launch them in designed platforms and create new products and services with crowd's support. However, due to its multidimensional and multi actors' nature, past contributions on the topic are few and scattered across different fields, not giving a comprehensive view of the phenomenon. The aim of this research is to analyze the multifaceted crowdfunding concept in a holistic perspective, to investigate potential developments of the phenomenon and to propose future lines of research to increase the understanding of this complex yet attractive topic. We analyze the three main actors' perspectives: online platforms, entrepreneurs and the crowd, explaining how the meaning of funding and the role of users is changing through crowdfunding initiatives, presenting an example of a successful crowdfunding project as well as critics moved to it. Furthermore, directions for future research are presented.

Enterprise Crowdfunding: Supporting Openness in Innovation Management beyond Obtaining Ideas

Crowdfunding - Mini-Talk

Niels Feldmann, Henner Gimpel, Michael Muller, Werner Geyer

Enterprise crowdfunding is the application of the crowdfunding concept to idea management inside an enterprise. Employees are encouraged to submit ideas to an internal crowdfunding platform and they are endowed with corporate budget to spend on the ideas submitted by fellow employees. Ideas that reach their self-set funding limit receive the respective funds and are implemented without further management approval or veto. Enterprise crowdfunding provides an opportunity for employees to gain awareness for their ideas, and for companies to harness employees' collective intelligence for idea assessment and connect decision-making with direct funding of selected ideas.

We accompany the technology and consulting company IBM in conducting a series of successive trials of enterprise crowdfunding in different corporate departments and geographies. In a mixed method research program, we build a theory of enterprise crowdfunding grounded in qualitative interviews and analyze empirical data on user characteristics, behavior, and outcomes. The interviews focus on the objectives for and expectations in enterprise crowdfunding, behavior of participants, and outcomes, as well as various structural parameters affecting the acceptance, use, and effectiveness of enterprise crowdfunding. The analysis of empirical data gained from the IBM trials allows us to reflect on the findings of our qualitative study.

So far, enterprise crowdfunding has been implemented by providing employees opportunities to propose ideas and invest corporate money in them. Hence, it has been an approach of internal openness. Opening up the mechanism to external idea proposers, or external investors or even both would make it a true open innovation mechanism. Hence, while focusing on Enterprise Crowdfunding, we believe our research will also provide stimuli for analyzing other open innovation approaches, in particular those addressing phases beyond obtaining ideas.

During the poster session at the workshop we will present early findings from the first 20 interviews with IBM executives organizing the enterprise crowdfunding trial, employees participating in them, as well as researchers from related fields (e.g. prediction markets or open innovation). We will also provide insights into the analysis of data from enterprise crowdfunding trials conducted at IBM.

Patients and Caregivers as sources of innovative ideas and solutions: a multiple case study approach

Crowdfunding - Full Presentation

Rita Oliveira, Pedro Oliveira, Leid Zejnilovic

Recent academic literature shows that patients and caregivers are a significant source of innovative solutions related to their medical condition. To date, little is known about the process by which these innovations emerge, how they diffuse, and how they impact the lives of patients and caregivers. In this work we follow a multiple-case study approach to map a set of patient innovations and adoptions of patient innovation cases, and systematically explore how and how far patients and caregivers innovate in the health care field. In addition, we propose some explanations for why patients and caregivers stop at a certain stage of progression of the innovation process.

We conducted 15 extensive semi-structured interviews with patients and caregivers of the following group of diseases: spinal cord injuries, Angelman syndrome, epidermolysis bullosa, cerebral palsy, and hemiparesis. These individuals shared with us their experiences with their disease and their efforts, or the lack of them, to overcome specific problems related to their health condition. This includes 4 "holistic" case studies and 26 "embedded" case studies. With the information from these cases, we analyze patient innovation paths and present them in the fall-offs conceptual framework. Through a cross-case analysis, we find that duration of the experience with the disease, complexity and pressure of a certain situation, belonging to a group or a community, and perceived value of a solution are among the most important reasons that impact how far patients and caregivers take their innovations.

As a result of our multiple-case analysis we present a set of propositions from which future research in the field.

Exploring roles of crowdinvestors in start-ups

Crowdfunding - Mini-Talk

Nadine Moser

In the last years crowdfunding, i.e. the online pooling of money from private individuals in return for some kind of reward, has become a viable source for funding social, creative and entrepreneurial projects. Project owners, who have successfully funded their ideas via crowdfunding platforms, report that the crowd does not only provide capital, but also help with the distribution of the product or generally increase awareness for the project. Especially young ventures who suffer from liabilities of newness and smallness would benefit from such seemingly free marketing efforts of a crowd of investors.

Research in related areas such as customer participation in new product development, viral marketing or user communities shows that individuals can help and assist an innovator or venture in many ways. However, these individuals are customers or users with shared interests and not investors, hindering the transfer of findings one-to-one. As the literature on crowdfunding has not explicitly addressed the activities and role behavior of investors, this study tries to shed light on if, when and how crowdinvestors provide resources, know-how, networks or feedback to the start-up. Moreover, it also explores whether investors' activities are valuable to the young venture or rather generate opportunity costs, conflicts or a loss of control. On the basis of an explorative multiple case study design the following questions should be answered: 1) Which roles do crowdinvestors take that go beyond funding? (2) Why do investors engage in these roles? (3) How does the interconnectedness of the crowd impact the individual role behavior? (4) What is the impact of investors' roles for the focal start-up firm? Insights with regard to these questions are relevant both form a theoretical and managerial perspective. This study will improve our understanding of the power of the crowd and contribute to the establishment of crowdfunding as a new form of venture finance. It is supposed to create managerial implications for start-ups and platforms, both interested in successfully pooling the funds of private individuals who are willing and able to provide added value to the venture.

Communicating aeronautics innovations, 1900-1916

User Communities - Full Presentation

Peter B Meyer

Using bibliographies of aeronautics publications worldwide up to 1916, we find that the number of publications rose until 1913, then fell sharply in 1914 and during World War I, especially in French and German. Most of this literature represented user innovation until 1907, then a literature associated with a startup industry appeared. Both forms of sharing decline as we enter World War I, although investment into less-public R&D continued at a high level.

The User Organisation: A broader perspective on collective user innovation

User Communities - Full Presentation

Jose Christian, Steve Flowers

This study presents the user organisation as a method of collective user innovation. Past studies have highlighted the non-hierarchical community-like structure of user groups, where the free flow of information aids innovation through the cumulative knowledge, skills, and know-how of its members. The study of open source projects has been key to the understanding of how these user communities function, providing insights into their governance and social structure (von Hippel, 2015). From past studies we find that community governance can have a direct effect on participation (West & O'mahony, 2008), and that the interaction between the core and periphery is key to its innovation process (Cox, 1998; Mockus el al, 2005).

The assumption that all open source projects resemble communities, however, limits the scope of the studies to a single group of individuals participating in one activity. Prime examples of open source software development focuse on either the study of contributions through the repository, or on the interaction between individuals in its message boards. In addition, the basis of membership to these projects has focused predominantly on programming contributions or programming support. This narrow view therefore ignores other forms of contributions such as documentation and non technical support. In addition, it also limits the analysis to one area of interaction, therefore presenting a limited view of the social ties and working dynamics of more complex projects.

This study uses the metaphor of the Organisation to gain a different approach to the study of collective user innovation, where a larger number of activities and social groups are taken into account. This study looks at the CyanogenMod project, a user modified Android operating system for smartphones. The project, established in 2009, provides its users with supporting products and services that are complimentary to the main operating system, all of which are maintained by the user base. This includes supporting software, which allows users to install the modified operating system, a dedicated forum for discussion, a wiki that includes tutorials and basic programming training, and a dedicated chat channel for non-programming user-to-user assistance.

The empirical evidence taken from the CyanogenMod project shows that the core-periphery conceptualisation is applicable only within each area of interaction or production, rather than the entire project itself. The project's multiple products and services has resulted in the creation of various communities with their own core-periphery structure, all who report to or are directly managed by the official project members. Both the repository and the wiki, for instance, were managed directly by official project members. On the other hand, the forum and the IRC were managed by general contributors who then report to official project members.
The results therefore shows that the CyangenMod project has taken a structure which resembles more an organisation than a community, with different practice-based communities and vertical lines of authority. By looking at the open source projects as an organisation, it may then be possible to study key aspects such as strategy and the use of resources.

Information Flow and the Loci of Influence in Online User Networks: The Case of iOS Jailbreak

User Communities - Full Presentation

Nitin Mayande, Charles Weber

The influence that individuals wield within online user networks has yet to be quantified, even though understanding the nature of influence online is becoming increasingly important. For the first time in history, Americans are expected to spend more time online this year than watching television. In response, many companies are reallocating their marketing resources to specifically target social networking platforms such as Facebook and Twitter. They are not just doing this to push their marketing messages; they also want to entice the user communities within their user networks to participate in the innovation process.

Extant theory on social networks has not been particularly useful in characterizing the loci of influence in online networks. It is primarily based on connectivity, and it is derived from phenomena that are subject to real-world constraints. We cannot assume that it can explain the behavior of online networks, which are highly dynamic open systems to which traditional constraints such as physical distance and geography do not apply. Extant theory does not take possibility of preferential attachments into consideration, and it does not show how influence within a network depends upon control of information flow. A critical factor contributing to influence within a network may have been ignored. A manager's perceived influence may not reflect actual influence; managers may consequently choose incorrect channels to get things done.

The empirical study described in this paper investigates the nature of influence in an online user innovation network, Apple's Jailbreak community, whose members collaborate online to remove restrictions on iOS, Apple's operating system for mobile devices. The study characterizes how influence in this network depends upon information flow. It analyzes Twitter traffic concerning Jailbreak that transpired between the network's members over a period of a month in which critical events pertaining to iOS occurred.

The interaction between members of an online network represents a form of serial propagation. The number of paths within the network was chosen as a measure of the extent to which information can spread virally within the network, whereas the number of geodesics acts as a proxy for the speed at which information spreads within the network. Eigenvector centrality was chosen as a criterion for measuring influence because it measures the relative importance of particular nodes.

The study has yielded four important findings. First, user networks on open platforms like Twitter are activated by or in anticipation of specific events. Once the event passes, the network dissipates. Second, people within the user network interact even if they are not directly connected. Third, the extent to which information can spread virally, rather than the speed of information propagation, determines the loci of influence in online user networks. Fourth, eigenvector centrality may not a universal measure of influence in online user networks. Further research needs to be conducted for better measures of influence in online user networks to be found.
This study is a work in progress, which will hopefully lead to a behavioral theory of online user networks that encompasses influence, networks structure and information flow.

An Investigation into the Conditions that Influence Engagement in Virtual Communities

User Communities - Full Presentation

Matthew Terrell, George Kuk, Alexa Spence

The health and success of virtual communities have been attributed to the quantity and quality of the information and knowledge contributed to the community by its members. To inform contributions many platform hosts use incentive mechanisms, which can often lead to commitment by compliance. While we understand many of the reasons why users engage in a virtual community it is not fully understood as to when users engage. We conduct an empirical study in four communities hosted by Mobile Nations to understand the conditions that inform further user-engagement. We conduct an online survey to analyze the self-reported motives and conditions that inform active, responsive, and social engagement. We identify that while more knowledgeable, intrinsically motivated users actively engage and respond to other users and community requests, extrinsically motivated users maintain the internal relationships within the community.

The Best of Both Worlds: Conceptualizing Trade-offs between Openness and Closedness for Sharing Economy Models

User Communities - Full Presentation

Christopher Smolka*, *Christoph Hienerth

The sharing economy has gained researchers' and practitioners' attention over the past years. It centrally promotes the transformation from privately owned to publicly shared goods, services, and resources. The most significant elements of the sharing economy are access over ownership, digital disruption and information technology, peer-to-peer community and collaboration, social capital and trust among participants. Frequent links to open innovation can be established. Those links relate for instance to users sharing and diffusing resources to the community, to the actors' motives to participate, and to trust systems which encourage users' contributions for the public good. However, sharing economy models further expand these main features of open innovation approaches; they introduce elements of commercial organization and new types of business models that imply elements of closed manufacturing models. Thus, it seems that sharing economy models operate in between complete openness and closedness. But little is known about how such sharing economy models function and what characteristics from open or closed paradigms apply. Hence, the main research interest in this paper is to better understand the trade-offs between openness and closedness under which sharing economy models operate and to investigate the effects of such trade-offs for different types of sharing economy models. Therefore, the identified trade-offs are applied to five representative cases, namely Zipcar, Airbnb, Zilok, the Freecycle Network and Couchsurfing. Consequently, the Sharing Economy Spectrum is developed in order to depict and conceptually compare these cases. As a result, the findings reveal important aspects for further research and for companies in the sharing economy.

Online and Offline Social Entrepreneurship in the Light of Mega-Events

User Communities - Mini-Talk

Diego Mastroianni

This study investigates how online communities focused on social entrepreneurship coordinate online and offline activities to develop user innovation by navigating the tensions of countries and cities hosting mega-events. Venues that present themselves as candidates to host mega-events - such as the FIFA World Cup, the Olympics, the Universal Exhibition and others - are often lured by the promise of increased visibility that they will bring to the venue. One example often cited by candidate cities to host the Olympics is the case of Barcelona, in Spain, which saw its tourism related economy more than double from 1990 to 2000, in great part due to the city being the host to the 1992 Summer Olympic Games. While local citizens typically welcome the nomination to host such events, the increased visibility brings to the surface societal issues that are far detached from the sports event itself, as they not always benefit from the changes brought about by the games. Therefore, protests have become common in the years from the announcement of a successful host bid to the actual mega-event. The recent Winter Olympic Games in Torino, Vancouver, Sochi, to cite a few, have sparked their fair share of criticism and protests from the local populations. In the meantime, organizations are still learning how to build and engage with OCs in a way that provides value both to their members and the company. Given their reliance on a partly volunteer workforce and their fight for "the good cause", social entrepreneurs have a deep interest on engaging with OCs to achieve their goals. Social entrepreneurship refers to activities that identify a social need and aims at producing social value through non costly solutions that often involve some kind of innovation. We offer data from a case study of a country-wide online community in Brazil that was inspired by the country's nomination to become a host nation to the FIFA World Cup in 2014. We analyze one particular action of this OC that aimed at bringing innovations to the public transportation system by using the knowledge of the users. Dissatisfaction with the public transportation in Brazil was at the core of protests that occurred in the country in June 2013, during the Confederations Cup, a test event for the Football World Cup 2014. This community mobilized a crowd in dozens of Brazilian cities to place stickers in bus stops lacking information about bus lines and provided a means for the common user of the transportation system to share his or her knowledge with other users. Our data suggests that offline activities lead to more vibrant OCs in three major ways: first, by allowing community members to meet face-to-face, offline events promoted deeper socialization among members. Second, these events were in most part organized by the members themselves, allowing them to be more deeply involved in the community's activities. Third, offline interactions provided rewards that were translated back to the online environment. This study has implications to the literature on online communities and user-led innovation.

Communities in the Federal Armed Forces

User Communities - Mini-Talk

Koller Hans

In our research project we want to investigate user communities and communities of practice in the military service. We assume that the prerequisites for establishing communities in terms of common values and companionship are widely spread. Secondly, we assume that there are many experts in different organizational units facing similar tasks. Probably, they would be happy to practice a vivid exchange of information which could ease their job. If they are facing unexpected conditions during an assignment abroad this exchange of information might even be of vital importance. Thirdly, we assume that young soldiers who grew up as "Digital Natives" are going to network anyway via social media.

We are convinced that there is a huge potential for cultivating and using communities in military services, in particular since this organization has a pronounced tradition in building communities. Thereby, we want to focus on user communities and communities of practice.

We would like to address the following research questions:

- What is the current state of using communities in the military service?
- What are general conditions for establishing and using communities regarding infrastructure, confidentiality of information, available resources, preferences, and possibilities for face-to-face-meetings etc.?
- Can we substantiate the assumption that communities improve – or even enhance – the status of knowledge with respect to specific tasks among all members, in particular with reference to the fact that the incumbents are changing every second or third year?
- What about typical communication between the soldiers as lead users of technical devices and the manufacturers? Can we verify that there are communities of experts integrating users from the military side and developers from the manufacturer side? Can we demonstrate the expected benefits for both?
- How to deal with the tension between the official hierarchy in the army and the self-organized communities? To what extent is self-organization accepted within the community? To what extend and how can the community be influenced by the hierarchical system?
- Can we find evidence for the assumption that common values and companionship is a nutrient medium for communities in the army? How does the membership in such a community influence the self-perception of the army and the own role within the army? How does the existence of communities affect and modify the culture in the army?

Methodological we are going to apply a mixed method approach: Primarily, we are going to investigate selected communities as a series of in-depth case studies. Additionally, we are preparing a survey amongst samples of typical formations.

We hope to contribute to the research of the OUI community by

(1) casting light of lead user research on an empirical field which has nearly not been investigated yet,

(2) adding an interesting empirical field to the potential of user communities within organizations,

(3) deepening the discussion about community management in a specific area of tension between self-organized communities and a supremely hierarchical organization,
(4) deepening our understanding about the two-way relatedness between communities and culture within a strong corporate culture.

Measuring Innovation in Remix Communities

User Communities - Mini-Talk

Harris Kyriakou

Open development of physical objects and products provides an opportunity to trace the evolution of ideas, the contribution of individuals and the degree of novelty of a proposed solution in the design space. Using a computer graphics technique, the degree of novelty of a design is measured, as well as individual contribution of each design when they are merged. Understanding the interplay between novelty of a proposed design and the use of prior existing ideas may be used to guide inventors toward combinations of ideas that are more likely to become successful.

The focal point of this research is Thingiverse, an open and dynamic community of designers where participants can freely download, modify or combine designs (Figure 1). Thingiverse creations are intended for 3D printing and vary in levels of complexity and applicability, ranging from toys and mugs to robots and quadcopters. This design inheritance network is the subject of analysis: design similarity can be measured using a shape comparison method from the computer graphics literature (Kazhdan, Funkhouser, & Rusinkiewicz, 2003) modified to function with 3D printing files and the multiple components nature of some designs (Kyriakou & Nickerson, 2013).

The effectiveness and downside risk of employing firm-controlled agents to calm down online firestorms

User Communities - Mini-Talk

Nik Franke, Peter Keinz

Because of the latest developments in ICT, online firestorms are increasingly becoming a potential threat to companies (Pfeffer 2014; Watts and Dodds 2007). Recent research points to masked online reputation management as a means to fight online firestorms: Infiltrating an online community with firm-controlled agents, who constantly spread a positive word-of-mouth and thereby influence their peer community members' opinions, has been shown to reduce the magnitude of the negative consequences of such conflicts (Stich, Golla, and Nanopoulos 2014).

However, little is known about the factors determining the effectiveness of this strategy. Which individual and/or community characteristics affect the capability of firm-controlled agents to calm down emerging online firestorms? Not each and every individual will be similarly capable of influencing peer community members (Miller, Fabian, and Lin 2009; Watts and Dodds 2007). And what about the potential negative consequences in the case of an uncovering of the firm-controlled agent(s) during the conflict? Complaint management literature suggests that in such a case, community members will feel betrayed and engage in particularly intensive negative word-of-mouth activities to punish the company (Finkel et al. 2002; Ward and Ostrom 2006).

In this paper, we aim at contributing to the understanding of masked online reputation management strategies by answering the questions raised above. We apply a case-based, agent-based modeling approach (Delre et al. 2007). In a first step, we collected detailed data on a real-life online firestorm (e.g., network structure, individual decision functions, and roles of all community members, etc). In a second step, we modeled the firestorm and used the empirical data to validate our model. In a third step, we conducted experiments in which we manipulated relevant characteristics of the firm-controlled agents as well as the online community.
Preliminary analyses show that employing firm-controlled agents (irrespective of their number and roles) indeed significantly reduces an online firestorm's magnitude, speed, and duration. Furthermore, we find that the number of firm-controlled agents being active throughout the conflict as well as their degree of opinion leadership positively affects their capability to calm down an online firestorm. These insights hold true for all simulated online communities. However, our simulations also show that even single agents located at the community's periphery seem capable of substantially reducing the negative consequences of online firestorms. This effect is stronger in online communities with a high initial average attitude towards the company. These insights deliver an interesting implication: Obviously, the optimal design of a masked online reputation management strategy varies depending on the type of community. In some settings, it might be sufficient to recruit only few, non-central agents, which is a relatively cost-efficient strategy. In other settings, it will be necessary to employ a more expensive strategy and to recruit a higher number of opinion leaders to calm down the firestorm. In the next steps of this project, we will also simulate the potential negative consequences of different masked online reputation management strategies in the case of their uncovering and contrast their downside risks with their positive effects.

Intellectual Property: Tension on Open Innovation?

Law, Policy, and IP - Full Presentation

Peter M. Bican, Carsten C. Guderian, Anne Ringbeck

As firms turn their innovation activities towards collaborating with external partners, they face challenges in controlling their property. Whilst different modes of intellectual property (IP) regimes are applied in closed innovation systems, there seems to be tension between the concepts of open innovation and IP. Analyzing the existing literature, we find IP to case-specifically en- or disable open innovation or to exert ambivalent effects. Further, as prior research concentrated on relations between IP and open innovation on aggregate levels, we introduce the Open Innovation Life Cycle as a precise management tool to integrate success factors of IP management over and beyond the collaboration process. Specifically, including considerations of collaboration terminations and deferred obligations early contributes to successful integrations. Additionally, the time disjunction of the Open Innovation Life Cycle and different IP regimes is discovered as the hinge factor in integrating IP and open innovation.

Degree of Openness in Public Policies – a Conceptual Proposal

Law, Policy, and IP - Full Presentation

Antonio Santos

This paper aims to analyze how public policies provide an environment favorable to the adoption of open innovation. From a conceptual framework of the most relevant policy areas that can influence the adoption of open innovation by firms, I analyse the main public policies developed in Portugal between 2007-2013, in an open innovation approach. I also propose a classification of the Degree of Openness of public policies.

This article brings up the topic of open innovation to the area of public policy, based in the conceptual framework developed, analyzing the conditions for the development of open innovation, applied to the case of the Portuguese public policies.

The Seven IP Commandments of a Crowdsourcing Community: How Self-Organized Norms-Based IP Systems Overcome Imitation Problems

Law, Policy, and IP - Full Presentation

Julia Bauer, Nik Franke, Philipp Tuertscher

In crowdsourcing communities, thousands of users reveal their ideas in order to get feedback, obtain assistance and suggestions for further refinement, and eventually win the endorsement of their fellow voters in the course of the tournament. All this is in done conditions that maximize the risk of theft and imitation. The intangible online setting with anonymous users from heterogeneous cultural backgrounds, and the absence of effective law-based IP protection encourage opportunistic behavior. Thus we should observe frequent violations of intellectual property, and in anticipation of this, only limited participation. However, in stark contrast to this, we observe that crowdsourcing communities flourish. We study this puzzle in the large and particularly successful Threadless community. Our core finding is that the viability of this crowdsourcing community is facilitated by a self-organized informal system of norms that governs the behavior of participants. We describe the system's elements, namely seven core norms, their interplay and functioning, and test its impressive effectiveness in a field experiment in which we intentionally violated norms by copying 62 designs. It appears that not only creative tasks, but also IP protection can effectively be crowdsourced to communities.

Innovation Policy within Private Collectives: Evidence on 3GPP's Regulation Mechanisms to Facilitate Collective Innovation

Law, Policy, and IP - Full Presentation

David Lopez, Annabelle Gawer

This article provides insights on how to manage collective innovation in the digital economy, an innovation regime which is riddled with complex regulatory challenges and increasing litigation over intellectual property rights. Private collective organisations face two main challenges: (1) to promote collective innovation while preserving the private interests of the firms within the collective, and (2) to ensure that collective innovation does not weaken healthy competition. Through a case study of the Third Generation Partnership Project (3GPP), an exemplary private collective federation of organisations composed of standardization bodies, industry consortia and technology producers, we identify organisational solutions to these challenges. We find that a combination of specific IP rights instruments is key to manage these trade-offs. We also find that the combined policies of essential patenting, FRAND, and maximum royalty rate help overcome the specific challenges associated with collective innovation within competitive contexts. Finally we discuss the implications of our findings for managers and for policy.

Exposed: Venture Capital, Competitor Ties, and Entrepreneurial Innovation

Law, Policy, and IP - Full Presentation

Emily Cox Pahnke, Rory McDonald, Dan Wang, Benjamin Hallen

This paper investigates the impact of early relationships on innovation at entrepreneurial firms. Prior research has largely focused on the benefits of network ties, documenting the many advantages that accrue to firms embedded in a rich network of inter-organizational relationships. In contrast, we build on research emphasizing potential drawbacks to examine how competitive exposure, enabled by powerful intermediaries, can inhibit innovation. We develop the concept of competitive information leakage, which occurs when firms are indirectly tied to their competitors via shared intermediary organizations. To test our theory, we examine every relationship between entrepreneurial firms and their venture capital investors in the minimally-invasive surgical segment of the medical device industry over a 22-year period. We find that indirect ties to competitors impede innovation, and that this effect is moderated by several factors related to the intermediary's opportunities and motivation to leak important information.

Antecedents to free revealing valuable knowledge in intellectual property appropriation regimes: An empirical study

Law, Policy, and IP - Mini-Talk

Martin Finkenzeller

Field of Research

Knowledge and the way it is shared via various channels among different people can be an important competitive advantage (Bartlett, 2013), but once this valuable knowledge is shared with others the information gets a public good and might therefore get disvalued (von Hippel, 2008). This is especially the case in online communities, in which the flow of information is difficult to control.

Today there exist a number of these communities focusing on the development of business ideas, potentially bringing them to the market. The concept behind it is that you get the chance to share your business idea with the online community and collaboratively work on it supported by a number of experts from different fields. That way entrepreneurs can get feedback on their ideas, establish important contacts for further business and gain reputation in the start-up community.

Yet these platforms, like many other platforms that rely on the free revealing of valuable knowledge, face one major problem: Users are holding back ideas and knowledge to prevent them from being stolen. In fact there mostly are neither law-based nor norms-based systems that protect intellectual property and could hinder users stealing ideas.

Research Question

Derived from that problem, I decided to investigate the following research question: "Under which conditions are individuals more likely to reveal personally valuable knowledge in appropriation regimes?"
To underline the relevance of our project some related papers are listed in the following:

- Norms-Based Intellectual Property Systems: The Case of French Chefs (Fauchart & von Hippel, 2008)
- Profiting from voluntary information spillovers: how users benefit by freely revealing their innovations (Harhoff, Henkel, von Hippel, 2003)
- The Seven IP Commandments of a Crowdsourcing Community: How Self-Organized Norms-Based IP Systems Overcome Imitation Problems (Bauer, Franke, Tuertscher, 2014)

Methodology

To investigate the antecedents to free revealing activities in appropriation regimes, first an explorative study is going to be conducted. The findings of this study should contain the most important attributes for free revealing in our context. With these results various scenarios are developed, which then are being tested in an experimental setting.

The aim of this research project is to further explore the field of Norms-Based Intellectual Property Systems in order to understand the underlying working mechanisms and add to the growing literature (Bauer, Franke, Tuertscher, 2014). The results should enable us to design an online platform in which users are most likely to share their ideas freely among each other, possibly creating a Norms-Based Intellectual Property System themselves.

This project is currently in an early stage and work in progress. Therefore feedback on the research question itself, the theoretical basis and the research design is highly welcome.

Less Reputation for Innovation?

Law, Policy, and IP - Mini-Talk

Patrick Höflinger, Christian Nagel, Philipp Sandner, Isabell Welpe

For a set of European, US and Asian firms, this study investigates how innovation activities contribute to the development of a reputation for innovative performance. Although it is known that companies develop a reputation for innovation, current state of research fails to provide evidence of its roots. Consumers' perception of the firm's innovative performance is traced back to its resource-based antecedents. Results indicate that reputation for innovation is caused by companies' inventive and technological performance. By taking a resource-based perspective, this study contributes to a contemporary discussion in reputation research regarding the relevance of intangible assets. Insights of this study improve the understanding of how the management of intangible assets influences its formation.

Patient Innovation under Rare Diseases and Chronic Needs

User Health - Full Presentation

Leid Zejnilovic, Pedro Oliveira, Helena Canhão, Eric Von Hippel

Rare diseases patients are in "orphan" markets. They can expect limited help from producers in the form of specialized products, so they have strong incentives to develop or adopt solutions developed by peers, to help them cope with the diseases. We conducted a survey among rare diseases patients and their caregivers in Portugal, with the objective to measure frequency of patient innovation, efforts by patients to share their solutions with others, and to explore which factors drive patients to come-up with solutions, and share them.
We applied the questionnaire over phone to a consecutive sample of 500 rare disease patients/caregivers. Subjects were selected from the list of individuals who contacted the helpline of an association of rare diseases patients from 2009 to 2012. The solutions reported by patients who agreed to participate were validated for their novelty by two medical professionals. Additional data about 251 diseases in our sample were collected from external databases. Logistic regression models were used to test the relationships between our key variables and patient innovation and solution sharing.

263 (52.6%) of the respondents reported to have a solution they came-up with on their own. 40 (8%) individuals reported solutions that they personally find valuable, and that are also evaluated as novel by expert medical evaluators. The likelihood of patient innovation increased as education level increased (OR 2.1), and as perception of limitations imposed by the disease increased (OR 1.33). 84 individuals shared their solutions, mostly in a patient-to-patient form (74). We found a positive relationship between the impact of a solution on the respondents' overall quality of life and likelihood of them sharing their solutions, and an inverted U relationship between age and the solution sharing.

If anything like this fraction of innovators holds for the overall population of hundreds of millions of people world-wide estimated to be afflicted by rare diseases, patient and their caregivers who innovate to solve their own needs and improve their personal conditions may be a tremendous potential resource of information to improve management and care for many who are similarly afflicted.

Patients as user innovators – The case of medical smartphone applications

User Health - Full Presentation

Moritz Goeldner, Alexander Kaufmann, Vivienne Paton, Cornelius Herstatt

Prior research has shown that User Innovation is a valuable resource for identifying new product or service concepts that have been developed by innovative users. However, only few scholars have contributed in analyzing how different users are interacting along the value chain of a product.

In some cases so called intermediate users and end users were identified. They use similar products differently and possess different kinds of knowledge. In our study, we want to analyze the contributions of intermediate and end user within the innovation process.

Several studies in the healthcare sector have shown that healthcare professionals are a valuable source of innovation. However, both companies and scholars have so far paid only little attention to the end user of medical devices: Patients. In this paper, we want to focus on the innovative behavior of patients and relatives, their motivation and their contribution to improving the quality of their own and ultimately of other patients' therapy. We analyzed innovations of producers, healthcare professionals (intermediate user) and patients/relatives (end user) in the German, UK- and US-based market for medical smartphone applications (Apple App Store) and subsequently conducted eleven semi-structured interviews. Our findings indicate that end user develop applications that are rated better, are downloaded more frequently and are significantly cheaper than applications developed by intermediate user. The interview data displays the high medical knowledge of patients, particularly of those with chronic diseases.

The overall findings are in line with a current stream of literature indicating that patients are getting more influence on their treatment, are better informed and are taking more actions in order to increase their quality of life. Commercial healthcare companies should take advantage of this and consider including patients in their R&D process.

Knowledge Creation Practices in a Healthcare Collaborative Work Community

User Health - Full Presentation

Diego Mastroianni, Samer Faraj, Hani Safadi

Collaborative Work Communities (CWCs) are redefining collaboration beyond geographical and organizational boundaries. In such settings, participants unknown to each other united by a common interest may join forces to promote collective welfare (Sproull & Arriaga, 2007). CWCs have existed even prior to the existence of the web and proliferated in a multitude of contexts with the introduction of Web 2.0 tools in the early 2000s. Typically a vibrant CWC is behind major collaborative projects in the realms of open source software and user innovation (von Hippel & von Krogh, 2003).

Such is the case of OSCAR, an open source EMR (Electronic Medical Record) system that has been in existence for over a decade and is currently used by over 2,000 Canadian doctors to follow up over one million patients. What is particular about OSCAR is that its large community of developers and users is largely embedded in a population of medical doctors and not "techies", as it is the case with most typical open source projects. This novel form of organization, which can compete with traditional commercial structures and still gain market share competing with similar products with licenses costing $25,000 per year per user in average, is an important subject of inquiry that still hasn't received the attention it deserves from academia.

While research has informed us about why people share their knowledge in these communities (Olivera, Goodman, & Tan, 2008; Wasko & Faraj, 2005) and how participation patterns emerge over time (Faraj & Johnson, 2011; Johnson, Faraj, & Kudaravalli, 2014), most of these studies focused only on the online interactions between community members. In other words, very few studies were conducted by analyzing a Collaborative Work Community in their full extent of interactions - both online and offline. The current work is an attempt to bridge this gap and provide us with a deeper understanding of how a Collaborative Work Community interacts around the conception, development, and implementation of an information system. In particular, this paper pays particular attention to core members of the community, what we call the "1%", as they engage in more complex collaboration practices with their peers than peripheral members of the community.

Diffusion as a Validation Process: Learning from Patient Innovators

User Health - Full Presentation

Tomas Fidelis, Leid Zejnilovic, Pedro Oliveira

There is growing evidence that patients and their family members innovate in therapies, and medical devices. These patient innovators are increasingly recognized as an important source of innovation. However, little is known about the paths they take to validate their solutions before involving health regulators.

We attempt to understand these patterns of informal validation and how their comparison with current validation methods of medical innovations can improve such processes. To address this, we study cases of patient innovators who attempted to share their innovations with other patients. More specifically, we structure the observed processes of patient innovation diffusion as a process model for an iterative observational trial process in which incremental validation of the innovation is performed by diffusing it to other patients.

We argue that learning from patient innovators' practices is important for discussing viable frameworks and structures for improving these processes, and discuss related implications to innovation research, management and policy.

User entrepreneurial management: Findings from a survey research of Japanese fishing tackle industry

User Health - Mini-Talk

Xin Yu, Susumu Ogawa

User entrepreneurs are innovative end-users who originally create new products for personal use and later launch new business ventures to diffuse their innovations. To date, a great deal of attention has been paid to these users, but little is known about how user entrepreneurs manage their ventures. Using data from a questionnaire-based survey of Japanese fishing tackle industry, this paper compares user entrepreneurs and non-user entrepreneurs in terms of their business objectives and production activities. Also, this paper finds that even as the industry approaches maturity, the market entry of user entrepreneurs is not decreasing, and many are able to survive and generate sound profits in the face of market competition.

Users (Patients) willingness to open personal health data for an innovative APP to receive a more efficient health care service

User Health - Mini-Talk

Philipp Plugmann, Julia Plugmann

It has been researched that a close relationship is probable between periodontal diseases and widespread diseases like diabetes or cardiovascular disease. This interdisciplinary situation for the user (patient) needs an individual health care data management to prevent further threats. The DMD (Doctor of Dental Medicine) can measure relevant parameters in the oral region to define the status of the periodont in the timeline. The MD (Medical Doctor) has all the informations about the general diseases of the user (patient).

It would be more efficient for the patient, MD and DMD to exchange datas, mixed with information that the patient add to the app, which is visuable for all 3 parties (DMD,MD and patient). This interdisciplinary approach could help users (patients) and reduce costs in the health care systems through prevention and early warning indicators. The technology is around, but is the patients willingness open to give data information in such an APP ?

In this paper, we interviewed from January – December 2013 in a multicentre study (4 dental clinics) 528 patients with periodontal disease history in two groups. In the first group (n= 244) no user had a general disease before and in the second group (n=284) they had minimum 1 general disease or more. We find that, 93% of the second group, would open their individual health care data to such an innovative App, allow the MD and DMD to write in certain medical parameters and would also input informations daily/weekly in, f.e. how they feel, what they eat and if they still smoke. In the first group 32% would open their individual health care data to such an innovative App.

Our empirical results showed significantly that there is a high users (patients) willingness to open personal health data for an innovative APP to receive a more efficient health care service, in the group of users with periodontal disease history and one general widespread disease or more. This user willingness should be used to develope appropriate IT solutions, implement them into the health care market and reduce costs for the health care system. The users benefit is the prevention of further medical threats. We discuss the implications of our results for the future of health care services and the innovator role of the user (patient). A transformation model of future health care services delivery is also a scenario that we speculate about.

Perceived firm attributes and intrinsic motivation in sponsored open source software projects

Open Source - Full Presentation

Vivianna Fang He, Georg Von Krogh, Sebastian Spaeth

Voluntary contributions are crucial to the success of open source software (OSS) projects. Firms sponsoring OSS projects may face substantial challenges in soliciting such contributions, since volunteer participants are neither regulated by an employment contract nor offered financial incentives. While prior work has shown the positive impact of motivation on the effort expended by volunteer participants, there is limited understanding of how specific firm attributes shape volunteers' intrinsic motivation. We offer a theoretical model of how the perceived community-based credibility and openness of the sponsoring firm have a positive impact on the intrinsic motivation of volunteer participants. The model is explored using survey data on volunteer participants from two sponsored OSS projects. Results show that the perceived community-based credibility and openness of a sponsoring firm strengthen the volunteer participants' social identification with a firm-sponsored community, which in turn reinforces their intrinsic motivation to participate. Moreover, the perceived community-based credibility of a sponsoring firm directly enhances volunteer participants' intrinsic motivation, whereas perceived openness fails to affect motivation without the mediating mechanism of social identification. Implications for firms seeking voluntary contributions for their sponsored OSS projects are discussed.

Organizing Firm-Community Collaboration for Growth: How to Benefit from Open Source Projects without Hurting Them

Open Source - Full Presentation

Dilan Aksoy-Yurdagul, Francesco Rullani, Cristina Rossi-Lamastra

This paper focuses on collaborations among firms and communities for obtaining better outcomes from open source projects. In specific, we aim to disentangle how organizational design may affect the performance of an OSS project. Project's management model and employee involvement in the project are treated as potential mediators that may have an effect on the aforementioned relationship. The empirical analysis is undertaken on a sample of OSS projects hosted on the platform SourceForge.net from December 2006 to December 2008. The findings of this study are three fold. First, being directly involved in a project with a specific policy on OSS has a positive effect on project's performance. Second, coordination by firm has a negative effect on performance. Third, admin as an employee on main duty does not have a direct positive effect on performance. However, it positively moderates the aforementioned relationship. The findings contribute to knowledge on benefits of collaborations between firms and OSS communities. Firm's role in the complex coordination mechanism of the project on project's success has been investigated. Managing the boundaries of collaborations is essential. Written rules and guidelines lead to fruitful joint development of software.

Does it Pay to be Open? Corporate Knowledge Development, Community-Based Innovation & Value Creation

Open Source - Full Presentation

Dilan Aksoy-Yurdagul, Sonali Shah

Firms are increasingly contributing knowledge to the open and collaborative product development organizations known as user innovation communities. This behavior is perplexing in light of traditional theory in strategy and innovation management, which emphasizes protecting knowledge in order to sustain competitive advantage. As a result, explanations for why firms contribute knowledge to innovation communities have focused on indirect sources of value generation, such as the introduction of complementary products and services, displacing competitors in the value chain, and standard setting. However, another powerful source of value generation exists: the ability to co-develop knowledge that will subsequently be used in commercial products. We build a theoretical basis for this possibility: by drawing on recent work in the area of user and community-based innovation, we explain why insights from innovative users can generate value for firms. We test our hypotheses on a novel data set that captures the stock market response to open source code contributions made by public, U.S.-based, software firms over a thirteen-year period. We find that knowledge contributions generate pecuniary value for firms. We also find that contributions of more novel knowledge generate greater value for firms than contributions of updated or existing knowledge. Finally, we find that contributions of novel knowledge intended for products aimed at generalist consumers rather than experts generate even greater returns.

Public Digital Goods and Firm Productivity

Open Source - Full Presentation

Frank Nagle

As free digital goods become more widely available and more frequently used as key inputs by firms, understanding the impact they have on productivity becomes of critical importance. In this paper, I measure the impact of one such good, open source software (OSS), on firm productivity. I find a positive and significant return to the usage of OSS. I address the endogeneity issues inherent in productivity studies by using an instrumental variable approach combined with panel data and firm fixed effects. Further, I use a matching estimation to provide additional support for my primary finding. I estimate that a 1% increase in the amount of non-pecuniary OSS used by a firm leads to a .18% increase in productivity across firms, and a .09% increase in productivity within firms. Further, I find that larger firms gain a larger return to the usage of OSS. My findings fill an important gap in the existing literature on the returns to IT investment, which currently does not properly account for non-pecuniary digital inputs.

Value capture in hierarchically organized industries: The role of open source inputs

Open Source - Full Presentation

Joachim Henkel, Alexander Hoffmann

Most goods today are designed and produced by value chains of firms, and open source or other freely available inputs may enter the value chain at various points. The value that a value chain as a whole captures is distributed among its members through bargaining. For complex products, such bargaining will consist of several individual negotiations, typically structured according to the hierarchical organization of the respective industry. We introduce the notion of "bargaining structure" to describe the sequence and participants of these individual negotiations. Using cooperative game theory, in particular the Shapley value and extensions of it, we show how bargaining structure affects the distribution of value among the constituent firms of the value chain, and in particular the appropriation of the value that open source modules contribute to the value chain. Positions in the bargaining structure most conducive to value capture are those where large complementarity gains are realized, and split among an ideally small number of negotiators. Since the bargaining structure of a value chain is to some extent malleable, firms have an incentive to shape it in such a way as to optimize their own value capture. We suggest that product architecture is a key lever to influence the architecture of the value chain, and as a consequence bargaining structure and value capture.

Diversity of participants in open source projects: Revealing differences within and between software, content, fun and business communities

Open Source - Mini-Talk

Daniel Ehls

Open Source Innovation gained its momentum with software development but nowadays spread well beyond this project type and has attracted numerous participants. So far, literature ignores widely these further project examples and assumes that project types are equal in terms of their participants. We challenge this assumption and postulate member diversity between project types. We stretch beyond repeatedly analyzed cases of iconic software initiatives by including content communities as well as we introduce fun and business project types to have a appropriate resemblance of digital production communities. Our analysis reveals significant differences within and between projects in both, participants' demographic and contribution rationales. Thus the contributions of this study are multifold and target (1) phenomenon enrichment, e.g. a detailed comparison of the open source landscape with as yet unconsidered community types, (2) research validation, e.g. replication of earlier studies aligned to latest developments and with yet lacking samples, and (3) theoretical advancement as we respond to the call to contextualize research and spark off the discussion of diversity in open source innovation.

Free- and Open Source Software (FOSS) in Emerging Countries - A Qualitative Case Study on the Role of Users in Policy Development in Southern India

Open Source - Mini-Talk

Schirg Florian

Ghosh (2003) suggests that its potential to fight poverty may be significant since FOSS offers sustainable economic viability, an open platform to gain professional knowledge, adaptability and cost advantages. We conducted an exploratory qualitative study and interviewed 18 experts across Southern India. Our main research question was: Does FOSS influence the Indian economy, its development and its social environment? Software licenses are unaffordable to the average Indian citizen. Moreover, we found the notion of software as an independent part of a computer is widely unknown. Consequently, piracy is not only common (68 % according to BSA 2008), but users do neither have consciousness of piracy, nor of the illegal nature of such. In many parts of India, FOSS is not promoted, with a few exceptions decision makers are neutral and chose mainstream products. A exception is the State of Kerala, where a notable case study was revealed. Due to certain promoters, FOSS is not only widespread but through unusual paths it influenced educational and economic policy in an unexpected way.

We conclude that FOSS creates innovation also in a political area and positively contributes to reduce the digital divide through lowering barreers of access: Proper governmental intervention in the ICT sector may lead to gains in efficiency and wealth. The example of the implementation of Malayalam script and language demonstrates that promotion of FOSS in low income economies does advance the structural change in the economy in a beneficial way.

Evolution of Coupled Engagement between SMEs and an Open Source Community

Open Source - Mini-Talk

Jonathan Sims

To better understand the coupled process of open innovation (e.g. Enkel et al., 2009), I have conducted a multi-year qualitative study of exchange relationships between entrepreneurial small and medium enterprises (SMEs) and a prominent open source software community. Qualitative analysis of over 30 interview transcripts provides insight on two research questions. First, this research illustrates how SMEs manage the coupled process. Findings suggest that this process can be codified by the degree by which a firm both "takes from" and "contributes to" the community. The combination of these two activities leads to norms of enthusiasm and concern for the community, and cooperation among competitors. These consequences are different from the direct effects of either "contributing" or "taking" alone. Secondly, the multi-year design of this research provides insight on the evolution of the coupled process. Findings suggest that specific community and SME actions can either disrupt or enhance the degree to which managers perceive the community as a resource for firm growth.

When young firms change – the case of decreasing openness

Open Source - Mini-Talk

Joachim Henkel, Dominik Hepp

Young firms, being quite "open" and revealing proprietary knowledge during their early years, often become more "closed" over time. Such development raises two questions: How does a young firm's level of openness evolve over time, and why do young firms perform such a shift? We perceive a firm as being "open" when deliberately revealing proprietary knowledge a firm could have kept secret, and granting the recipient extensive rights regarding use, replication and appropriation.

This research follows a longitudinal, embedded multiple-case study design with 12 technology-based ventures within the industries of virtualization/network management software and embedded/operating systems using an extensive data set from interviews and secondary sources.

We suggest to interpret a firm's move toward a lower degree of openness as a search process, and distinguish between three different types:

Problemistic search/optimization: The initially chosen "open" approach did not work satisfactorily. The firm reduces openness, e.g., to exploit new revenue segments, or to reduce leakage of knowledge to competitors.
Adaptation to changing conditions: The firm and its environment have changed and require a firm to revise its "open" approach due to, e.g., growth of internal resources, raise of capital, decreasing benefit from revealed knowledge, or increased competition based on the firm's revealed knowledge.

Adjustment to changing values: The management's values and goals may have changed from, e.g., community-oriented to more business- and profit-oriented. Such change may also come about through turnover in the management team.

A high degree of competition should strengthen both the positive effects of resource scarcity, capital scarcity, and reputation need on the degree of openness, as well as the negative effects of knowledge leakage and imitability.

Our framework advances the understanding of the phenomenon of young firms' move toward lower degrees of openness. This research has three important implications for the organization and management literature.
When studying search processes, distinguishing between local and distant search (March, 1991) might not be sufficient. One should additionally differentiate according to the trigger of the search: the realization of a misfit with its environment, changes in external and firm-internal conditions, or changed goals and values of the firm's decision makers.

Firms learn by observing other organizations (Denrell, 2003). Their interpretations of the environment shape organizational responses (Eggers & Kaplan, 2013). However, when interpreting actions of a firm (e.g., a competitor), managers need to consider and understand the mechanisms driving them. Our study lays out the mechanisms behind a firm's shift toward less openness, thus allowing for a better interpretation of observations.

While the literature highlights the benefits of openness (e.g., Alexy, George, & Salter, 2013; Chesbrough, 2006; Dahlander & Magnusson, 2008; Harhoff, Henkel, & von Hippel, 2003; Henkel, 2006; von Hippel, 1988; West, 2003), openness as a strategic measure has received only limited attention (Alexy et al., 2013). Explaining a shift toward less openness as a response to realized misfit, changes in conditions, or changes in values, our framework conceives openness as a strategic measure to address specific challenges which is subject to change.

Contextual Information, Innovation Capabilities and Incentives – The Core and the Periphery of User Innovation

Problem Solving - Full Presentation

Dietmar Harhoff

The user innovation perspective provides an elegant, yet simple solution to the "sticky information" problem described by Eric von Hippel. Need information may be well known to the user, but is costly to transfer to manufacturers. The solution to the problem is that the user himself becomes an innovator and then transfers a working prototype to a manufacturing entity. I suggest that other forms of user contributions to innovation may be economically important, too, even if users do not account for a first prototype. The paper presents some data supporting this view. Using data from the most recent PatVal inventor survey I show first that users and customers provide highly important information for invention processes. Moreover, users and customers are the preferred partners for formal and informal collaboration in invention. A descriptive multivariate analysis suggests that high importance of user-origin information and collaboration between inventors and users are associated with above-average patent value and with particularly high rates of commercialization. Hence, even in a context which most classical user innovation studies have avoided – invention processes with subsequent patenting, mostly in manufacturing firms– external users make a strong contribution to innovation.

Identifying viable "need-solution pairs": Problem solving without problem formulation

Problem Solving - Full Presentation

Eric Von Hippel

Problem-solving research, and formal problem-solving practice as well, begins with the assumption that a problem has been identified or formulated for solving. The problem-solving process then involves a search for a satisfactory or optimal solution to that problem. In contrast, we propose that, in informal problem solving, a need and a solution are often discovered together, and tested for viability as a need-solution pair. For example, one may serendipitously discover a new solution, and assess it to be worth adopting even though the "problem" it would address had not previously been in mind as an object of search -- or even interest. In such a case, problem identification and formulation if done at all, comes only after the discovery of the need-solution pair.

In this essay, we propose the identification of need-solution pairs as an approach to problem solving in which problem formulation is not required. We argue that discovery of viable need-solution pairs without problem formulation may have advantages over problem-initiated problem-solving methods under some conditions. First, it removes the often considerable costs associated with problem formulation. Second, it eliminates the constraints on possible solutions that any problem formulation will inevitably apply. We suggest that this approach merits further investigation.

Do people encounter new need-solution pairs? Evidence from Living&Interieur fair suggests: YES

Problem Solving - Full Presentation

Beate Edl, Nik Franke, Eric Von Hippel

Literature in the area of problem-solving traditionally assumes that the problem solving process is initiated by an identification and formulation of a problem. After the problem is formulated an optimal solution to that problem is sought. However, currently von Hippel and von Krogh (2013) proposed that often the need and the solution are discovered simultaneously - without an explicit prior formulation of the problem. In such a case a problem is formulated after a viable need-solution pair is identified – if the problem is formulated at all. The simultaneous identification of need-solution pairs provides several advantages: First, no resources are invested in the problem formulation. Second, as no solution space is defined, all possible alternatives are considered for the solution and no feasible/viable alternatives are excluded ex-ante. While in practice the discovery of need-solution pairs may be frequently used, scientific literature by now deals with this issue only on an anecdotal basis.

Consequently, our current research project investigates the question whether traditional problem solving or simultaneous need-and-solution finding is the dominant strategy. Therefore in this project we measured the relative frequency of both problem solving strategies. To investigate the research question on an empirical basis, we conducted 127 interviews with visitors at the fair "Living&Interieur" at the Reed Exhibitions in Vienna at the beginning and the end of their visit.

Preliminary results show that indeed the majority of need-solution pairs are identified (45%) when solutions for prior undiscovered needs are spotted. In contrast, only 21% of all identified need-solution pairs are characterized by the traditional sequence in problem solving and the prior specification of particular needs. 22% of all identified need-solution pairs are based on needs "ex post reconstructed" or already forgotten and rediscovered when seeing the solution. The smallest group is characterized by solutions to initial problems, which have additional features that are solutions to newly discovered needs.

Furthermore a clear majority of people found at least one new need-solution pair (68%) and one-fifth of the interviewees found only new need-solution pairs. The traditional problem-solving strategy, where at first a need is specified, was used by about 10% of visitors exclusively. Most visitors used more traditional forms of problem solving as well as the simultaneous identification of needs and solutions.

In the next steps, we aim to answer the following questions: What influences the way people discover need-solution pairs, e.g., time spent at the fair, problem solving abilities, level of focus during the search process? Does the approach of problem solving without problem formulation leads to the identification of more important underlying needs than the traditional approach? To validate our findings, we replicated the study at a B2B fair. Additionally we will investigate if people use stimuli offered at the fair to create new needs-solution pairs that are not intended by the producer and if the way need-solution pairs are discovered is influenced by the freedom of the individual to change the need.

Joining an Ecosystem: Organizational & Strategic Implications

Problem Solving - Full Presentation

Elizabeth J. Altman

With the increasing worldwide popularity of products that include open interfaces such as smartphones, tablets, and personal computers, individuals are becoming increasingly comfortable with complementary products where a product becomes more useful when it is combined with applications and accessories. Organizational theory and strategy research on platforms and ecosystems address these dynamics, but tend to center on organizations competing at the core of ecosystems. This paper focuses on organizations at the edges of these systems that join ecosystems and must follow rules determined by others. Based on a three year qualitative longitudinal inductive field-based study, this research investigates organizational and strategic changes experienced by a firm as it joins an ecosystem and strives to balance maintaining its independence and growth aspirations with its need to operate within an ecosystem. I find organizational identity implications associated with asymmetries in power, communication, and interest and accompanied by a loss of control. This paper contributes to research on organizational identity, resource dependence, and asymmetric inter-organizational relationships, and also complements burgeoning strategy and organizational research on ecosystems and multi-sided platforms.

How do barriers influence the user innovation outcome? - A qualitative study on the home energy management sector

Problem Solving - Full Presentation

Thorsten Pieper

Users face user innovation barriers during their user innovation process. This leads firstly to changes in the user innovation process itself and secondly, if barriers are too severe, to changes in product properties. In worst case the user will give up the innovation project completely. In our qualitative study we thus examine the research question "How do barriers influence the user innovation outcome?" We examine this question with the help of variables including information about user innovation drivers, objects and processes as well as questions about user innovation barriers and their specific impact. We conducted a study in the home energy sector and interviewed users who developed own solutions in their home energy management. This study presents first qualitative results which contribute to user innovation research and provide answers to the question which innovative activity is more likely to be expected when certain barriers influence the realization of user innovations? Further, the study reveals implications how users can be enabled to succeed in their innovation activities and how firms may support those activities more effectively.

The role of the user in innovation - Results from the Finnish Community Innovation Survey (CIS 2010) and Survey of Finnish consumers

Problem Solving - Mini-Talk

***Jari Kuusisto** , Mervi Niemi*

Until recently, statistical analysis of user innovation has remained almost unknown territory as indicators and measuring have focused on more traditional forms of innovation. Theis paper brings together analysis of user innovation among Finnish businesses and consumers.

Promoting innovation is a policy objective in many countries and, in Europe, the activity of innovation is measured directly by the Community Innovation Survey (CIS) which has been conducted during the last twenty years. The purpose of the CIS is to inform the public policy debate around innovation and its outcomes.

New questions on user roles in innovation were added to the Finnish 2010 CIS probing the importance of users as sources of information and as active collaborators. It also examines the importance of products made by users to the activity of innovation in the producing enterprise. A robust finding of the survey is the importance of users of the goods or services produced by enterprises and brought to market. Users are principal sources of information for the business innovation activity and they are also leading collaborators or co-innovators for the innovative enterprise. There is no question that users are key players in the activity of innovation. However, their role as innovators in their own right has been less well explored. A significant new finding is that products originating with users are most commonly reported by the enterprises with innovations new to the market. This may indicate that user orientation creates foundation for products new to the market, but this needs to be surveyed in detail and exactly proved. The new question on users in the activity of innovation in Finland was experiment for the first time and the findings suggest that more work needs to be done. Based on the Finnish work follow-up CIS surveys have been carried out in Switzerland and in Portugal.

The Finnish survey on consumer innovation supports the Ministry's policy programme and it builds on recent work by Hippel et al., in the UK, Japan and Netherlands. Besides measuring the frequency of innovation by Finnish consumers, it explored the diffusion of the innovations for the benefit of the society. This is critical from the social welfare perspective because it is the diffusion that enables wider society to gain benefit from consumer innovations.

The survey results show that 5.4 percent has of Finnish consumers between 18 to 65 years old had engaged in innovation for personal need during the past three years time 2009-2012. These citizens had created at least one new item for their personal use to fix an everyday problem, or to improve an existing good or service. With population of 3,197,037 citizens aged 18 to 65, the estimated total number of consumer innovators in the Finnish population is around 172,640 individuals. Such a number of active consumer innovators represents a significant innovation activity which is not represented in official surveys so far. 19 per cent of the validated innovation cases did spread to other economic actors, whereas 81 percent did not diffuse at all.

User innovation and user innvators in Colombia

Problem Solving - Mini-Talk

Sandra Sanchez

It has been demonstrated that users not only consume products manufactured and marketed by companies, they are also a source of ideas and creators of new products. In Colombia, for instance, the Development and Technological Innovation Survey 2011-2012 revealed customer users were the main external source of ideas for innovation used by industrial firms. However, to the best of my knowledge, there is no formal research addressing neither user innovation activities nor user innovator characteristics in Colombia.

Ogawa & Pongtanalert (2011) and Mujika-Alberdi et al., (2013) pointed out the importance to apply large-scale surveys in both developed and developing countries to comprehend better consumer user innovation activities. Gault (2012) identified the need for collecting and document-ing systematic data that measures user innovation activities at the consumer level, contributing to a better understanding of the nature of the innovation. In Colombia this phenomenon has not been studied yet, therefore, to fill this gap, this research pretends to contribute to a deeper understanding of user innovation activities and user innovator's characteristics at the consumer level in Colombia. The purpose of this research is to identify the characteristics that distinguish user innovators from user non-innovators in Colombia. To do so, it is necessary to apply a large-scale survey to identify the characteristics of each group of users in Colombia.

On the other hand, Ogawa & Pongtanalert (2011) provided a comparison about the percentage of user innovators at the consumer level in the United States (US), Japan and UK. The results show that a significant percentage of the population in those countries has engaged in user innovation activities by creating or modifying a wide range of products. Ogawa & Pongtanalert (2011) pointed out that 5.2% of the population in the US and 3.7% of the population in Japan can be considered user innovators. Those results correspond to the percentages of user innovation, particularly activities such as creation and modification of goods done by the consumers. Specifically, the exploratory study made in Colombia in 2013 was performed to explore the percentage of user innovation activities in a sample of 547 adults in Bogotá. The exploratory study showed 5.5% of the sample created or modified consumer products. Participants also reported their level of education; the highest percentage was university level; the tendency to innovate was more pronounced among people aged 25-30 years.

The results of the exploratory study carried out in Colombia cannot be dismissed, they show evidence of user innovation activities performed in Colombia and constitute a starting point to collect and document data at the national level to contribute to a better understanding of user innovators and user innovation activities.

The UPS Scale: An Instrument for Measuring Users' Perception of Simplicity

Problem Solving - Mini-Talk

Sara F. Jahanmir, Luis Filipe Lages

The vast range of literature exploring the topic of user-led innovations (e.g. Baldwin & von Hippel, 2011; Bogers, Afuah & Bastian, 2010) and the variety of industries interested confirm the key role of users in new product development (Alam, 2002; Hoyer et al., 2010). Through user-led innovations, manufacturers and researchers can find out more about user preferences. As such, we conducted 7 studies, in which users went through a new product development process to come up with new ideas. Results from these studies showed that one of the major preferences of users is simplicity.

Research on acceptance and diffusion, such as Technology Acceptance Model (Davis, 1980), Rogers' diffusion of innovation curve (Rogers, 2003) and Technology Adoption Propensity (Ratchford & Barnhart, 2012), has pointed out ease of use as a critical determinant of adoption. Rogers (2003) defends that there is a negative correlation between complexity and rate of adoption. This means that products that are less complex and easier to use diffuse faster. Simple products help consumers make decisions faster and save time. Simplicity also contributes to powerful relationship with customers, leading to higher brand loyalty (Belk et al., 2012). Moreover, consumers pay significantly more for products that are easier to use (Burke, 2013). Thus simplicity should be a core value for any business or organization.

Simplicity is about subtracting the obvious and adding the meaningful (Maeda, 2006). Simplicity is also defined as "clarity of function and operation" (Hannah, 2012) or "the state of being simple, uncomplicated or uncompounded" (Merriam Webster Online Dictionary). Thus simplicity serves a purpose: to help us make decisions faster, save time and money and minimize the debate over choices that we make (Belk at al, 2012)
In this study, through a measurement scale, we aim to create a common ground for assessing consumers' overall attribute toward simplicity.

Based on insights from an empirical study, we propose to assess consumers' perception of simplicity through three dimensions; 1) preference for simple solutions (PSS), 2) complexity refusal (CR), and 3) preference for few attributes (PFA). All dimensions emerge from items inspired by our qualitative study and Maeda (2006).
Our findings reveal that simple solutions are associated with firm's performance as well as brand loyalty and global brand knowledge Moreover, consumers perceive simple products to have higher value for money and higher fulfilment of their expectations. We expect our scale to be an ideal tool for practitioners who wish to apply this scale to their own consumers and consequently, redefine strategies and actions to implement more elements of simplicity in their new products and services and consequently increase the rate of adoption as well as brand loyalty and global knowledge about their brand.

To sum up, in today's competitive markets, it is important to understand users' perception of simplicity, in order to find out which features should a product have or not in order to diffuse faster.

Involve customers in problem-solving process: how to catch the right customer?

Problem Solving - Mini-Talk

Belbaly Nassim, Clémence Cheruy

While much researches has emphasized including customers in New Product Development process, it has been proved that companies and customers are now working together. Additional studies worked on improving this co-creation movement and focused on specific customers labeled as Lead users and showed that product-related need engage Lead user to develop innovative output. However, little work has focused on using innovative customers in problem-solving process. Build on the idea that need or solution can emerge without problem formulation (Von Hippel and Krogh, 2013); the authors draw on research on Lead users theory combines with creativity and motivation theories to support their conceptual model. The authors developed a structured survey instrument that they have administered to 353 managers from different industries in France who interacted within their online crowdsourcing ideation platform named "Minder platform" and they validate scale to measure creative performance of common users (idea quality) to find problem-solving solutions. The authors showed a positive relation between Lead users characteristics and creativity personality traits of common user and built a comprehensive model combining lead user characteristics, common user creativity and intrinsic motivation as precursor to innovative problem-solving solutions.

Involving users in evaluation of innovation commercialization readiness

Problem Solving - Mini-Talk

Irina Fiegenbaum

Our research focuses on the involvement of users in the innovation process, and in particular in the user-driven evaluation of ready-to-commercialize innovations. We base our research on the typology of users by Geoffrey Moore (1991) and von Hippel (1986) and conduct a structured literature review to discover the roles of users at different stages of innovation process. We follow the Stage-Gate innovation process for classification of stages. We distinguish what roles different types of users play at different stages of innovation process, and focus in particular to the under-researched stages of innovation development and commercialization. At the current stage, the literature review is finished and the case study is planned. The case study will involve different innovation projects of big Finnish IT company as well as is considering to conduct multiple case study afterwards. We plan to present the up-to-date status of research, first findings and are hoping to receive some feedback regarding the methodology and the potential benchmarks if known, as the user-involvement at the later stages of innovation process are rarely described.

Understanding the role of users in radical innovation of meanings

Problem Solving - Mini-Talk

Sara Jane Gonzalez

The research project is focus on understanding the contribution provided by users in radical innovations of meanings. The research scope includes the analysis of the innovation process conducted by companies to generate ideas and develop new products and services and how users get involve at different stages of the process. I would like to understand what methods enable collaboration between users and organization to solve problems and develop innovative solutions. Main expected results are the development of a design management proposal (i.e. method, toolkit, theory), which enable communication between the different stakeholders –managers, designers, users- and facilitate the process of collaboration (and co-creation).

User Innovation as Problem Solving: Perspectives from the Global South

Problem Solving - Mini-Talk

Gillian Marcelle

This paper extends the user and consumer innovation paradigm by using it in an exploration of innovation dynamics in emerging and developing countries. The critique of the producer focus of innovation management and policy has become well established (Baldwin and von Hippel 2010, von Hippel et al 2011, Hiernerth et al 2013, Raasch and von Hippel 2013). As in other parts of the world, in developing countries, producers and consumers are both important performers of innovation, but often have different motivations and experience varying conditions for practising innovation. In the developing world, problem solving to deal with resource constraints plays a central role in innovation. Development challenges provide a different set of incentives for innovation and this is particularly true for non-market based innovation activity.

The paper is part of an ongoing research programme that explores innovation dynamics in the global South. This research has argued that at present a lot of innovation policy is either silent or deeply flawed in terms of providing an understanding of enterprise level perspectives on and dynamics of innovation and therefore needs to be reformulated so that it pays greater attention to the perspectives of innovation performers (Marcelle 2014, 2012, 2011). The author is also involved in a number of empirical studies of the practice of innovation in a variety of settings in the developing world and uses insights gained from these studies (Marcelle et al 2013). to support the conceptual position that is advanced here.

The paper provides a working definition of innovation as a departure point; this is followed by a section which provides an analytical and interpretative review of the literature on user-consumer innovation, which we term the von Hippel School, as well as, treatments of innovation management by enterprises in the global South, from both a macro and micro perspective. For comprehensiveness, we also review scholarship emanating from business schools such as the studies that have been labeled "reverse innovation"; "jugaad innovation" and "frugal innovation". The main contribution of the paper is to contrasts these insights with those of von Hippel school making suggestions for integration and extension. Von Hippel and colleagues have argued that the field of innovation is in the throes of a Kuhnian revolution in which paradigms are shifting and being replaced by fundamentally different understanding and interpretations of the nature of the innovation practice and efforts to facilitate its improvement (Baldwin and von Hippel 2010). This paper is in line with that argument and strengthens it by shedding light on conditions under which users and consumers in the developing world undertake the process of innovation. Producer-centric innovation schemas and frameworks do not serve developing countries well and by focusing on the user-consumer behavior, it is hoped that this work will generate insights that contribute to improving innovation performance. This appears to be already on the agenda of this community (von Hippel and Chen Jin 2009) and therefore we welcome the opportunity to make a contribution.

Keywords: developing world, global South, user innovation, consumer innovation, innovation dynamics

Self-regulated learning with new media: How user-designed learning environments affect performance

Problem Solving - Mini-Talk

Albrecht Karlusch

People in modern economies face enormous challenges nowadays to keep their knowledge up with the continuously changing job requirements. Due to the rapid increase of available and accessible information lifelong learning rather became a necessity than an advantage. Traditional courses, even when combined with new internet technologies, e-learning and blended-learning concepts, aren't any longer able to address people's needs of increased flexibility. Simultaneously recent research results (Archee, 2012) reveal a fundamental shift from centrally organized Learning Management Systems to individual Personal Learning Environments (PLE). These concepts are based on an individual set of tools to support people with different learning styles more efficiently. In future, PLE-toolkits will enable people to customize their individual learning environment on their own (Wilson et al., 2007). Some researchers argue that PLEs are already effectively applied as many online learners have already designed their own learning environment.

However, evaluation of the coherences between user-designed environments and learning-performance indicates the existence of additional relevant effects. It seems that people need remarkably different abilities and strategies to work in such environments efficiently. The present study is conducted to provide answers, why the implementation of PLEs without considering other parameters doesn't improve learning-performance. From a practical point of view, the results can be used to identify what kinds of support actions are necessary to enhance learning-performance.

To explain the additional effects we decided to consider different theories. Recent research results have shown that PLE concepts follow more constructivist- and connectivist- instead of instructivist- paradigms (Archee, 2012). We think that this epistemological change implies the consideration of cognitive, behavioral and self-regulating effects. To cover the cognitive and behavioral dimension we refer to the social cognitive theory (Bandura, 1976). We apply the triadic concept, integrating the three categories environment, cognition and behavioral capabilities to explain the concrete learning strategy. There is strong evidence that learning strategies are highly correlated with learning performance (Zimmermann, 1986). Previous studies show the influences of cognitive factors to environmental behavior (Compeau, 1999) but don't consider self-regulating effects. Hence we refer to research results about self-regulated learning strategies (Zimmermann, 1989). To cover the environmental user-design decisions we finally include variables from PLE-reference models. In sum our model considers cognitive variables such as outcome expectation or self-efficacy, behavioral variables such as technical- or self-regulation-skills and environmental variables such as network-, workflow- or social-patterns. The model will be applied to an explanatory survey to support the assumed importance of our identified parameters and correlations in the different triadic categories. In the course of a series of surveys we will adapt our model to improve the prediction efficiency. The results will be statistically validated by applying a regression model and factor analyses. Potential feedback loops within the model will be analyzed to reveal possible side effects. All significant results will be verified by additional data analysis to finally perform quantitative validation of the model. Finally, we want to present a theoretical model that is supported by experimental data and explains the reasons for improved learning performances in user-designed environments.

Directly or Closely Connected: Network Antecedents of the Technological Impact of Inventions

Diffusion - Full Presentation

Steffen Keijl

Whereas existing literature focuses on inbound open innovation, e.g. acquiring and sharing knowledge for the creation of inventions, in this paper we focus on outbound open innovation by looking at how the impact of a firm's inventions is influenced by a firm's inter-organizational network position. Especially when it comes to the creation of new markets, standard setting, and licensing out, an understanding of why inventions of some firms are more impactfull than inventions of other firms is lacking. Then, studying the impact of inventions is important as firms will somehow try to appropriate the value of their inventions. The general conception of technological impact concentrates on the extent to which inventions are adopted and reused in subsequent inventions. Our study differentiates between impact on partners versus impact on non-partners. Impact on partners focuses on the extent to which alliance partners make use of each others inventions. Impact on non-partners resembles the reuse of inventions by firms with whom a focal firm does not collaborate. Furthermore, we differentiate between the number of direct ties and the overall network position as antecedents in the process of impact generation. The empirical setting for this study is the bio-pharmaceutical industry with a sample of 179 patenting firms. Results indicate that both the number of alliance partners as well as the overall network position of a firm affects the technological impact of inventions.

* Additional remark: In my study the focus is on inter-organizational networks and the impact of inventions on the firm level. Besides presenting my study, I would like to discuss opportunities for future research that may combine these topics of "user innovation & diffusion" and "network characteristics".

The role of inventing users in the diffusion of surgical techniques

Diffusion - Full Presentation

Mareike Hinsch, Christoph Stockstrom, Christian Lüthje

Users innovate to solve their needs and benefit from use, however, they may have nothing or "too little" to gain from diffusing their solutions to others who might benefit from them. Even if user innovators decide to engage in diffusing their solutions, diffusion may be hindered by the fact that use-related knowledge is often very sticky and therefore difficult to acquire. This is especially true for user innovations in techniques such as new surgical procedures for example. Moreover, potential adopters may perceive adoption as very risky because they are often unable to properly assess the benefits of a new technique, as these are often contingent on the specific circumstances in which it is carried out and may consequently vary considerably. A resulting under-diffusion of user innovations in techniques may incur considerable losses of welfare, as techniques not only provide benefits themselves but are often closely linked to physical objects such as tools, instruments, and equipment.

Drawing on actor network theory, we propose that user innovators may benefit from their personal relations when trying to overcome the aforementioned obstacles to the diffusion of techniques developed by them.
Analyzing data from a survey of German surgeons, we find personal relations with the inventor to have a significant impact on the timing of adoption of a new surgical technique as well as on the decision to engage in effective dissemination (i.e. teaching). We find that the diffusion of techniques differs significantly from the diffusion of physical products and requires much more personal effort and social connections on the part of the inventor as compared to products. Classical instruments of product diffusion, such as speeches at congresses, publications, demonstration videos, theoretical courses, and other material only have a limited impact on the diffusion of a technique. To achieve wide-spread diffusion, additional diffusion agents are crucial as the inventor's available time and professional network would otherwise likely prove a bottleneck, hindering further diffusion.

Our results suggest that the inventor of a technique has a two-fold impact on diffusion. First, as having a relationship with the inventor increases adoption propensity – particularly in the first stage of diffusion and early dissemination happens mainly through direct training offered by the inventor, she has a strong direct impact on diffusion. Second, as early adopters help to disseminate the technique in later stages of diffusion by training even later adopters and being closer to the inventor increases the likelihood of adopters becoming diffusion agents, she also has a strong indirect impact on diffusion. Consequently, future research should focus on the personal network of the inventors. Given the importance of winning additional diffusion agents, the incentives and costs of early adopters becoming diffusion agents could be investigated in greater detail.
Manufacturers are well-advised to even intensify their support of surgeons offering training workshops and accepting visiting physicians as they can hardly stimulate the diffusion of the technique themselves. Additionally, workshops and trainings may serve as a cost-efficient market test for equipment designed for the new technique.

Impacts of Personality Traits on User Innovation Success

Diffusion - Full Presentation

Ruth M. Stock, Eric Von Hippel, Lennart Schnarr

Via a questionnaire survey of 537 German consumers, we conduct a first-of-type study to explore links between the "Big Five" personality variables and successful accomplishment of three basic innovation process stages: (1) having an idea for a new product or product improvement; (2) developing a prototype that implements that idea; and (3) engaging in diffusing the innovation to others. We find that personality traits significantly associated with success differ for each of those three phases. The personalities of those who have new product ideas, relative to those who do not, are significantly higher on openness to experience. Consumers who actually go on to successfully realize their ideas in the form of a prototype are significantly more introverted than those who stop at the idea phase. Finally, those who attempt to commercially diffuse their innovations are significantly higher on conscientiousness and neuroticism than those who do not. After controlling for variables found important to innovation success in other research on user innovation and innovation-related tasks as predictors of stage completion, the Big Five personality variables accounted for 4% of the variation in likelihood of successful ideation, 3.2% in the likelihood of successful prototyping, and 7% with respect to the likelihood of attempted diffusion.

Since the personality traits associated with successful completion of each stage differ, we find the combination of traits an individual must possess to successfully traverse all three stages in sequence to be relatively rare in our sample. We suggest solutions to this practical problem, and also offer suggestions for further research.

Does rivalry preclude free revealing? An agent-based model of private-collective innovation systems

Diffusion - Full Presentation

Christina Raasch

The private-collective model has been advanced as a new model specifying the incentives that give rise to innovation in an economy: It involves the selective free revealing of design information created at private expense, in exchange for a mix of private and collectively provided benefits. This paper seeks to contribute to our understanding of the environmental conditions in which free revealing of selected design information is likely to emerge and thrive. We use an agent-based simulation to explore the impact of design rivalry on the emergence and performance of a system based on free revealing. We find that rivalry makes it less likely that such a system will emerge from self-regarding individual decision-making; this is in accordance with observations in the literature. However, whenever such a system does emerge, rivalry increases the prevalence of free revealing and also innovation performance. The reason is that rivalry induces greater design heterogeneity. Thus, rivalrous environments tend to produce either one of two outcomes: a canonical, non-cooperative private-investment innovation system or a cooperative private-collective innovations system that is characterized by intense cooperation and high innovativeness. The paper contributes to our understanding of the emergence and system-level performance implications of private-collective innovation.

Lead or Grow? Providing Tools for Innovation

Toolkits - Full Presentation

Coorevits Lynn

Companies are investing significant resources (time and money) in finding new products and services that can create value. Researchers and practitioners believe that involving users in the early phases of the creation process will enhance customer acceptance and as such the likelihood of success. Therefore, users have become a standard and active ingredient in the innovation process. Two streams of research have focused on the involvement of users in the innovation process by either developing tools for innovation or finding the right users. Various methods and techniques have been developed to improve the interaction between users, products and companies. Furthermore researchers have been searching for the 'right' users to involve in the innovation process, often suggesting the Lead Users as the only truly innovative ones. Yet, little research has focused on the combination of both. Therefore this paper will fill a gap in the literature by exploring whether providing the right tools for innovation can make regular users accomplish the same level of innovativeness compared to lead users. Additionally this paper will show whether lead users can suggest solutions that will fulfill the needs of regular users.

Enhancing Customization with 3D Printing: Value Creation Potential of Additive Manufacturing from a Consumer's Perspective

Toolkits - Full Presentation

Christian Weller, Robin Kleer, Frank T. Piller

Additive manufacturing (AM) technology (or colloquially "3D printing") has recently been hyped as paving the path towards a new industrial revolution. As one major benefit, AM enables new opportunities in offering highly customized products because customization does not cause cost penalties in manufacturing. Trying to bring the current hype surrounding AM down to an analytical level, we asked ourselves if the technological benefit of costless customization is a source of value creation for firms. This is why we have empirically assessed AM's value creation potential by evaluating perceived product value for highly customized products from a consumer's perspective in three online studies.

In Study 1, we assessed an online buying process of an espresso cup. We find that a higher degree of product co-design freedom leads to significantly greater perceived product value, in turn, resulting in higher willingness to pay (WTP). Thus, AM has the potential to create value with highly customized product offerings. Interestingly, the order of the scenarios matters: Once the product configuration or the stepless product co-design treatments are shown first, WTP for the standard product significantly increases. This implies a major managerial implication for customization offerings: Marketers should carefully separate customization offerings from standard product assortments in order to maximize WTP.

In Studies 2 and 3, we focused on the drivers behind the perceived product value for highly customized products by studying an online buying process of a customizable ceramic knife. We assessed the value of customizing aesthetic (e.g., color, shape) product design parameters in Study 2; while functional (e.g., handle fit to hand, weight) parameters were in focus of Study 3. Here, we find that higher degree of customization does not automatically induce higher product value. In fact, perceived product value highly depends on individual product involvement and preferences. In the specific case of the kitchen knife, a higher customizability was slightly positively valued in the case of a higher customizability of functional product parameters, but not for the aesthetic ones. Thus from a consumer's perspective, the value creation potential of AM is mixed—it highly depends on the products and the target groups. Therefore, marketers need to carefully choose the right (highly) customizable products and parameters. However, AM technology enables an enhanced segmentation strategy in which single niche markets can be served where higher customizability is adequately valued because AM's production costs are not subject to economies of scale.

Dynamic Interfaces for User Innovation

Toolkits - Full Presentation

Hari Suman Naik, Kathrin Möslein

Toolkits for user innovation enable users to develop innovative products and services based on their needs. They are systems specific to a field, for example integrated circuit design, or software game design and are restricted to the solution space of the underlying production system. As user innovators increasingly work with large design flexibility due to new technologies, we describe other systems that enable user innovators with large solution spaces and explain how they are used. We use multiple case studies on user innovated products in open source communities that were developed out of large solution spaces such as 3D printing and low cost modular electronics.

Six case studies were written on user innovations with a focus on two main case studies. The first case is on Robohand, a purely mechanical user innovation with 3D printed plastic parts but no electronics. It is a low cost prosthetic hand that allows people with missing or partial fingers to grasp objects. Its open design allows it to be built by using freely downloadable designs and standard components from a hardware store. The second case is on Koruza, an innovative low cost ultra-fast wireless network solution that works based on peer-to-peer contact using laser. It used 3D printed parts, standard components from a hardware store as well as standard electronics that communicate using a microcontroller.

The case studies show that hardware design is turning digital with shorter design cycles. Furthermore user innovators aren't restricted to modifying one product or confining themselves to one area but instead innovate by combining different products that may not have been designed to be combined in the first place. They use systems that give them the most flexibility to develop "dynamic interfaces" between existing products when needed, either as mechanical interfaces in the form of digital designs or as informational interfaces with the help of low-cost computing. This concept extends the notion of modularity within a system to modularity outside the system. It has implications on product development as end products can eliminate redundancies and become specialized, to connect to other products.

Essential toolkit for sustaining innovation based on new product design techniques

Toolkits - Mini-Talk

Salvador Gonzalez Garcia Chavaprof*, *Sandra Eugenia Garcia Hernandez Sandy*, *Octavio Diaz Barriga Octavio

This paper proposes a lean procedure for innovation based on the main techniques used in new product design and development. The suggested procedure consider the essential deliverables of those tools, accelerating the innovation process and establishing a framework to organize the whole innovation process or some parts of it. The tools considered in this proposal are: The house of quality, the morphological matrix, the Pugh's matrices and the FMEA. An example of sustaining innovation is also included.

Disentangling users' preferences for uniqueness in product customization

Toolkits - Mini-Talk

Markus Hagenmaier, Michael Zaggl, Christina Raasch

There is evidence in the literature that perceptions of uniqueness play an important role in mass customization. Mass-customized products allow customers to differentiate themselves from buyers of off-the-shelf products. Consistent with this hypothesis, past research identified feelings of uniqueness as a distinct factor in customer utility. Despite its relevance, so far research on uniqueness in mass customization has mainly focused on measuring the influence of perceived uniqueness on customers' willingness-to-pay, but neglected to investigate customers' preferences in the configuration process. For example, do they explicitly strive for uniqueness when configuring their product? And if so, in which decisions do customers want to differentiate themselves from others? We contribute to closing this gap by exploring how customers choose when given the choice between unique and common product options.

Theories from social psychology promulgate the existence of two opposite human needs: the need for uniqueness and the need for conformity. Individuals do not want to be perceived as simply following the crowd, at least to some extent they want to be dissimilar to others. At the same time, people are dissatisfied when they are too different to others resulting in a necessary internal tradeoff between these two needs. As mass customization requires customers to choose among multiple product attributes, their choice behavior is likely to depend on the different characteristics of the product attributes in addition to their personal needs. Feelings, such as uniqueness, are triggered by affective stimuli. Customers particularly satisfy those by attributes with a highly hedonic characteristic. We therefore propose that a customer's need for uniqueness will be mainly expressed by choosing unique options of hedonic attributes. Applying the same logic, we hypothesize that customers may orient themselves towards decisions of others when making their choices about highly utilitarian product attributes.

We test our hypotheses in experiments by means of a self-developed configurator that allows participants to customize an automobile. Our study consists of an online experiment and an ongoing laboratory experiment. We induce uniqueness and conformity at the attribute level by providing information on the uniqueness of a specific attribute level to the treatment group.

The results from the online experiment support our hypotheses: users choose differently when given information on the choices of others. They tend towards the popular options for utilitarian attributes (e.g., engine), but tend to prefer unique options of hedonic product attributes (e.g., color). We find a significant difference between the choices of the treatment and the control group in all utilitarian attributes. As hypothesized, a reversed effect was observed in the hedonic category "exterior color".

Our study contributes to the understanding of the two conflicting human needs for uniqueness and conformity, and their expression in purchasing decisions. We also contribute to the discussion of value drivers in mass customization by disentangling the customer preferences on the attribute level of the product – something that has not been done in prior research. Our findings also have practical implications related to information provision in mass customization toolkits, specifically information on the popularity of different options.

Value Generation in the Process of Self-Designing – A Longitudinal Study of Toolkits for User Innovation and Design

Toolkits - Mini-Talk

Nik Franke, Franziska Metz

Companies in various industries introduced toolkits for user innovation and design (von Hippel, 2001, Thomke, von Hippel, 2002) as a means to provide users with the opportunity to create self-designed products in a web-based setting. The underlying notion of this approach is that users are capable of self-designing products of higher subjective value (von Hippel, 1988, Franke, Piller, 2004, Franke, von Hippel, 2003, Levin et al., 2002). This mass customization approach provides the possibility to individualize products and integrate the consumer directly into new product development. But the design process still represents a "black box" since it is not known what actually happens during the process of self-designing a product, which role emotions, motivation, or attention play as well as how and when the value increases during the design process.

Current research shows, that self-designed products influence willingness to pay (WTP) (Franke, Piller, 2004, Franke, von Hippel, 2003, Park et al., 2000, Levin et al., 2002), satisfaction (Franke, von Hippel, 2003, Kamali, Loker, 2002) and the attitude towards the brand (Schreier, 2006, Schreier, Kaiser, 2008, Schreier, Fuchs, 2008) in a very positive way. Reasons for this value increase are (1) functional benefits, i.e. a closer fit of product attributes and customer preferences (Franke, Schreier, 2004, Franke, von Hippel, 2003, Kamali, Loker, 2002, Franke, Keinz, Steger, 2009), (2) the uniqueness of the products (Franke, Klanner, 2013), and (3) process-related psychological benefits that emphasize the pride and self-enhancement of being the originator of the product (Franke, Schreier, 2010, Franke, Klanner, 2013). All extant studies have in common that they measure the value effects after the individual self-design process has been finished. This point in time is of course important as the purchase decision is made here. However, we do not know when this subjective value emerges during the process. This is extremely important as a negative value (expectation) during or prior to the process might prevent customers from finishing it.

The objective of this research project is to open this black box and analyze subjective value generation and psychological effects during the process of self-designing a product with a toolkit. Regarding the method we plan a mix of several approaches:

- Experiments with a number of sample groups that will be questioned regarding WTP, satisfaction, motivation, and purchase intention etc. in different stages of the design process.
- Analyses of facial expressions using a face reader (e.g. by Noldus).
- Log files of self-design activities tracked during the process.
- Methods of neuraleconomic such as EEG or fMRI.
- All these methods are currently being evaluated. We expect that a combination of them will be most promising.