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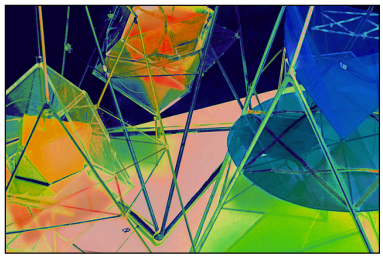

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Insights

Welcome to the August issue of the *Technology Innovation Management Review*. We welcome your comments on the articles in this issue as well as suggestions for future article topics and issue themes.

Carleton UNIVERSITY

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Chris McPhee

Overview

The *Technology Innovation Management Review* (TIM Review) provides insights about the issues and emerging trends relevant to launching and growing technology businesses. The TIM Review focuses on the theories, strategies, and tools that help small and large technology companies succeed.

Our readers are looking for practical ideas they can apply within their own organizations. The TIM Review brings together diverse viewpoints – from academics, entrepreneurs, companies of all sizes, the public sector, the community sector, and others – to bridge the gap between theory and practice. In particular, we focus on the topics of technology and global entrepreneurship in small and large companies.

We welcome input from readers into upcoming themes. Please visit timreview.ca to suggest themes and nominate authors and guest editors.

Contribute

Contribute to the TIM Review in the following ways:

- Read and comment on articles.
- Review the upcoming themes and tell us what topics you would like to see covered.
- Write an article for a future issue; see the author guidelines and editorial process for details.
- Recommend colleagues as authors or guest editors.
- Give feedback on the website or any other aspect of this publication.
- Sponsor or advertise in the TIM Review.
- Tell a friend or colleague about the TIM Review.

Please contact the Editor if you have any questions or comments: timreview.ca/contact

About TIM

The TIM Review has international contributors and readers, and it is published in association with the Technology Innovation Management program (TIM; timprogram.ca), an international graduate program at Carleton University in Ottawa, Canada.

Editorial: Insights

Chris McPhee, Editor-in-Chief

Welcome to the August 2017 issue of the *Technology Innovation Management Review* (TIM Review). The authors in this issue share insights on academic technology transfer, organizational culture, the sharing economy, social media for promoting research, and lessons from Machiavelli for today's technology leaders and managers.

In the first article, **Dimitri Schuurman**, **Stan De Vocht**, **Sven De Cleyn**, and **Aron-Levi Herregodts** from imec in Belgium share lessons from the development of their organization's academic technology transfer programme. The imec 101 programme highlights the importance of a structured technology transfer process in the early stages of opportunity discovery and entrepreneurial action, and it offers insights on team formation for academic spin-offs.

Next, **Ulla Santti**, **Tuomo Eskelinen**, **Mervi Rajahonka**, **Kaija Villman**, and **Ari Happonen** from three universities in Finland examine changes in organizational culture in response to business model development projects. Using the Competing Values Framework and CIMO logic, they present cases in which small shifts in types of organizational culture among SMEs can be observed even following a short-term intervention, highlighting the potential for development activities to "sow the seeds of change" in organizational culture.

Then, **Olga Novikova** from the Hanken School of Economics in Helsinki, Finland, uncovers new mobility-based models for the sharing economy based on interviews with 32 car-sharing service users, business owners, and mobility experts. Operating at the intersection of shared mobility, physical infrastructure, and integrated-mobility schemes, such models may provide innovative solutions to future transportation challenges.

The fourth article is by **Päivi Jaring** and **Asta Bäck** of VTT Technical Research Centre of Finland, who interviewed and surveyed both researchers from their own research institute and its potential customers to examine how effectively researchers use social media to promote their research and network with industry. Although they found social media to be a suitable and effective way to engage, promote research, and enhance personal reputations, their results also highlight how researchers can overcome challenges that often limit their use of social media.

Finally, **Clovia Hamilton** answers the question: "Does Machiavelli's *The Prince* have relevant lessons for modern high-tech managers and leaders?" Drawing on modern and high-profile examples of "flawed leaders" of technology businesses, she extracts lessons from Machiavelli's 16th-century work to show that they are indeed still relevant in today's cut-throat business environments.

In September, our editorial theme is Platforms and Ecosystems, and I am pleased to welcome guest editors **Ozgur Dedehayir** from QUT Business School in Australia and **Marko Seppänen** from Tampere University of Technology in Finland. The articles in this issue are based on papers presented at the 2017 ISPIM Innovation Conference in Vienna. ISPIM (ispim-innovation.com) – the International Society for Professional Innovation Management – is a network of researchers, industrialists, consultants, and public bodies who share an interest in innovation management.

For future issues, we are accepting general submissions of articles on technology entrepreneurship, innovation management, and other topics relevant to launching and growing technology companies and solving practical problems in emerging domains. Please contact us (timreview.ca/contact) with potential article topics and submissions.

Chris McPhee
Editor-in-Chief

Editorial: Insights

Chris McPhee

About the Editor

Chris McPhee is Editor-in-Chief of the *Technology Innovation Management Review*. He holds an MASc degree in Technology Innovation Management from Carleton University in Ottawa, Canada, and BScH and MSc degrees in Biology from Queen's University in Kingston, Canada. Chris has nearly 20 years of management, design, and content-development experience in Canada and Scotland, primarily in the science, health, and education sectors. As an advisor and editor, he helps entrepreneurs, executives, and researchers develop and express their ideas.

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Keywords: technology transfer, academic spin-offs, incubation, organizational culture, business model development, sharing economy, car sharing, social media, researchers, research institutes, Machiavelli, leadership, management

A Structured Approach to Academic Technology Transfer: Lessons Learned from imec's 101 Programme

Dimitri Schuurman, Stan De Vocht, Sven De Cleyn, and Aron-Levi Herregodts

> *"We now accept the fact that learning is a lifelong process of keeping abreast of change. And the most pressing task is to teach people how to learn."*
>
> Peter Drucker (1909–2005)
> Management consultant, author, and educator

In this article, we describe imec's 101 Programme for academic technology transfer and explain how it supports researchers by following a structured process in a limited amount of time and by carefully involving different stakeholders and people with relevant skills and expertise. The programme combines insights in terms of processes and of team composition from the entrepreneurship literature and puts them into practice in an internal incubation programme that is generated from the bottom-up. Based on hands-on experiences and interviews with key stakeholders in the process, we evaluate the programme and distill lessons learned. The article highlights the importance of a structured technology transfer process in the early stages of opportunity discovery and entrepreneurial action, and it offers insights on team formation for academic spin-offs.

Introduction

Opportunity discovery and entrepreneurial action are regarded as the core elements of entrepreneurship (McMullen & Shepherd, 2006). Research has shown that the nature of these two core elements depends on the entrepreneurial type. Regarding entrepreneurial action, Shah and Tripsas (2007) distinguish between user entrepreneurship and opportunity entrepreneurship. Whereas the "user entrepreneur" is driven by their own experienced needs and their initial experimentation with and adaptation of possible solutions, the "opportunity entrepreneur" starts from an entrepreneurial decision based on the spotting of an external opportunity and engages in experimentation and adaptation afterwards. Within this article, we focus on a third entrepreneurial type: academic researchers that engage in the process of technology transfer. Perez and Sanchez (2003) define technology transfer as the application of information into use, involving a source of technology that possesses specialized technical skills, and the transmission to receptors who do not possess them and who cannot or do not want to create the technology themselves.

A specific case of technology transfer is the academic spin-off. These spin-offs exploit technological inventions resulting from academic research that are otherwise likely to remain unexploited (Shane, 2004). The number and successes of these spin-offs vary between different universities and research institutes, as shown for example by a pan-European study by De Cleyn and colleagues (2008). Di Gregorio and Shane (2003) identified two factors that increase new firm formation activity: i) the intellectual eminence of the university (or other research institute) and ii) policies of making equity investments in startups and maintaining a low inventor share of royalties. We observe that the more "eminent" universities and research institutes dedicate a lot of effort to technology transfer offices (TTOs) and entrepreneurship programmes. Famous examples are Germany's Fraunhofer technology transfer activities (Rombach, 2000) and the MIT in the United States with Bill Aulet's "New Enterprises" course and its derivation, "Disciplined Entrepreneurship" (2013), which promote a rigid 24-step process to successful entrepreneurship. These institutions infuse entrepreneurship into most aspects of university activities and try to create an en-

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trepreneurial climate with a structured approach towards technology transfer and academic spin-offs.

Human capital also has a large impact on the outcomes of the technology transfer process. Research indicates that academic spin-offs face more difficulties in the beginning than company spin-outs. Business parent organizations are better able than universities to provide spin-off companies with assistance and benefits, such as different kinds of knowledge and physical assets (Smilor, 1987). De Cleyn and colleagues (2015) argued that, for academic spin-offs, the absence of a proven track record in the market increases the importance of the human capital of the organization. They discovered that team heterogeneity is crucial for the chances of success, particularly in high-tech environments. Likewise, they found that experienced entrepreneurs also improve the team, but their study does not support the "serial entrepreneur effect" (unlike other studies, such as Shane, 2004; Barney et al., 2001).

Besides the team itself, the communication between different participating actors is seen as crucial, because the efficiency of the technology transfer process depends on the efficacy of the information processes between various actors and stakeholders (Rothwell & Robertson, 1973). Moreover, the capability to build alliances with relevant stakeholders can significantly reduce barriers to successful transfer (Lambricht & Teich, 1976).

Based on these observations, an approach to technology transfer was developed within the Flemish technology research institute imec (imec-int.com), taking into account these aspects related to academic spin-offs and other forms of academic technology transfer such as licensing. Within the 101 programme, as the approach is labelled, the focus lies on a rigid and structured process with clear deadlines and milestones, with special attention to project-specific team composition for the duration of the programme and beyond.

This article seeks to contribute to our knowledge and understanding of the technology transfer process in academic institutions. More specifically, it aims to build further knowledge on the importance of a structured technology transfer process in the early stages of opportunity discovery and entrepreneurial action. And, it seeks to focus attention needed for team formation in cases where the academic spin-off might be the primary, but not single, outcome of the technology transfer process. It also illustrates that establishing a structured approach to technology transfer within an organization can be a bottom-up effort, starting from smaller experiments to allow the programme to fit within the existing organization.

In the remainder of this article, we first report on the status of Flanders as a region for technology transfer and innovation. Subsequently, we look into some "best practices" related to technology transfer in the context of universities and research institutes. We then describe the 101 process as it was implemented in imec during the period from 2015 until now. We conclude with findings and discussion based on the first batch of projects that have followed the 101 programme.

State of the Art: Technology Transfer in Flanders

Scientific and technical research, development, and innovation are key factors for economic growth and improved competitiveness. Also, innovation, understood as the productive application of this scientific development and technology, is therefore an important engine for regional development if the goal is improved productivity and a change in the production model, thus occupying a preferential place among the principles of the Europe 2020 Strategy (European Union, 2015). The following statistics from 2014 summarize Flanders in terms of science, technology, and innovation (STI) (Flemish Government, 2016):

- Total annual budget: €1.88 billion (of which, €1.23 billion is strictly for R&D)
- Total Flemish horizontal budget (across all policy domains) for the science policy: €2.19 billion (of which €1.31 billion is strictly for R&D)
- Total Federal STI budget for Flanders: €300 million
- Total European STI budget for Flanders: €183 million
- €5,738 million on R&D (GERD – Gross Expenditures on R&D), of which 2/3 paid by companies and 1/3 by public research institutes
- The R&D intensity of Flanders was 2.46% (measured as the percentage of GERD related to GDP)

Based on the average innovation performance, the European Union (EU) Member States fall into four different performance groups, as classified by the Innova-

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tion Union scoreboard (European Commission, 2017): i) "innovation leaders" with innovation performance well above that of the EU average; ii) "innovation followers" with innovation performance above or close to that of the EU average; iii) "moderate innovators" with performance below that of the EU average; and iv) "modest innovators" with innovation performance well below that of the EU average. In the latest Regional Innovation Scoreboard (Hollanders et al., 2014), Flanders ranks among the innovation followers; consequently, its ambition to be among the top innovative regions in Europe requires further effort.

These numbers might seem rather impressive, but in Europe, Flanders is still labelled as an innovation follower (Flemish Government, 2016). Therefore, the new Flemish Government has confirmed in its governing agreement for the period 2014–2019 a focus on a growth path for the 3% target of R&D intensity, including the aim to achieve 1% R&D public outlays/GDP by 2020. To reach this goal, the government continues to stimulate various stakeholders from government, civil society, business organizations, and STI actors in Flanders to join forces to develop initiatives, set policy targets, or maintain important efforts for the long term in the field of R&D and innovation. Important actors in this ecosystem are the technology transfer offices (TTO). Each Flemish university has its own TTO, with each having a different number of spin-offs in its portfolio: TTO VUB (vubtechtransfer.be; 20 active spin off companies), TTO Ghent University (www.ugent.be/techtransfer/en; 32 active spin off companies and 9 pilot factories), TTO Leuven (lrd.kuleuven.be/en; 92 active spin off companies), and TTO Hasselt (www.uhasselt.be/techtransfer; 10 active spin off companies). Besides these university-related TTOs, Flanders also has four strategic research institutes – imec, VITO, VIB, and Flanders Make – that have fostered 33 spin-offs the past three years (Flemish Government, 2017). There is also a general technology transfer office, TTO Flanders, but this organization is merely dealing with information sharing and can be regarded more as a sector organization. The absence of a strong overarching organization has also fostered a climate of competition between the TTOs in Flanders. Moreover, the university TTOs focus mostly on specific services such as patenting, legal advice, help in starting-up a company, etc. Rarely do these organizations focus on the entrepreneurial process. Within this article, we describe the imec 101 programme as a way to overcome this gap by having a specific team composition and a structured process limited in time with clear deliverables.

The imec Approach to Technology Transfer

imec is the world-leading R&D and innovation hub in nano-electronics (since 1984) and digital technologies from Flanders and is a trusted partner for companies, startups, and academia. Since 2016, the new imec research institute is the result of the merger between the "old" imec strategic research centre and iMinds (Flanders' digital research and entrepreneurship hub). iMinds was a research institute founded by the Government of Flanders in 2004 focusing on applications of ICT and broadband technology. It was composed of 21 top-of-class research groups, divided over five research departments, and involved the entire Flemish media and ICT business community, with more than 1,000 researchers from the five largest Flemish universities (Ghent, Leuven, Brussels, Hasselt, and Antwerp) and a central staff of more than 100 people. With the merger, iMinds has become imec.Ghent, one of three business units of the new imec organization.

The problems imec faces during its continuous effort of bringing its technology to the market are similar to most research centres and universities around the globe: limited resources (time/money), different stakeholders, conflicts of interest, unclear decision criteria, involvement of different teams, and researchers that lack experience in business, among other challenges.

In the period from 2013 to 2015, before the merger, iMinds' technology transfer activities for researchers with promising technologies within the research institute were carried out by a single person. Responsibilities included patent portfolio management, legal & contracts, licensing, etc., and most importantly, this person was the liaison with the technology transfer offices of the universities. Although the university TTO colleagues and external consultants were involved in specific cases on an ad hoc basis, the limited amount of manpower available and the lack of a process resulted in very reactive and case-by-case technology transfer activities. Inspired by the approach applied by the Fraunhofer Institute (GE) and their so-called "FDays" (Fraunhofer, 2017), which are focused on entrepreneurial exploration and validation with potential customers in a limited amount of time, and informed by the technology transfer and entrepreneurship literature and knowledge within the organization, a first trial case was initiated by the single technology transfer responsible in iMinds in September 2015. Based on the experiences of this first trial, a first version of the 101 programme

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was designed and rolled out within the merged imec in early 2016, backed up by a few key decision makers in an attempt to strengthen the technology transfer process within the new research institute. This decision was informed by the promise that the programme could generate multiple benefits: a more efficient (faster) and more effective (higher quality outcomes) technology transfer process, as well as more robust and transparent decision making. The target population is imec researchers who are doing a PhD or hold a post-doctoral position involving a technology that might have market potential. For a duration of 12 weeks, with (at least) 1 day a week spent on the project by the participating core team, imec researchers have the chance to "get out of the building" to assess the market potential of their technology, as well as identify (and where possible already start to work on) some weaknesses and challenges (e.g., at the team level). The programme consists of three phases with clearly specified goals and deliverables.

The name "101" was chosen for several reasons:

- 101 means an introduction; here, it is an introduction to entrepreneurship
- imec is engaged in digital research (1s and 0s)
- 1 on 1 refers to the close contact between the researchers and the lead coach
- at the end of the programme, a binary go/no-go decision is taken (1 or 0)
- it refers to the time investment of the researcher (12 weeks at 1 day/week)

Programme structure

The structured 101 process is depicted in Figure 1: it starts with a kick-off meeting, lasts for 12 weeks, and guides the research team through three phases. Each phase lasts for 3 to 4 weeks, and ends with a final decision meeting. The goal is to come to a go/no-go decision for further investments by imec and the universities involved. Every phase ends with a meeting where all stakeholders are invited and where the valorization team needs to present its findings. These meetings give the team a fixed deadline with clear deliverables and objectives. At the kick-off meeting, the team discusses the technology and the different possible use cases. An obvious but important aspect within the kick-off meeting is that all participants engage in careful agenda planning for the coming weeks.

The first phase is all about structuring the assumptions underlying different aspects of the use cases identified by the team. The team needs to map the different customer segments, the problem addressed, the need aspiration, the current alternatives, the barriers to adoption, and the unique selling point of their solution. This mapping can be done for one or more use cases. After 3–4 weeks, the first phase meeting is organized to allow the team to present its assumptions and its different cases. During this meeting, a discussion and iteration are facilitated with involvement from all stakeholders (professors, university technology transfer office, business developers, program director, living lab experts, innovation managers, etc.). This discussion feeds the involvement and buy-in of all stakeholders, leading to a growing enthusiasm of all parties involved when progress is being made by the teams.

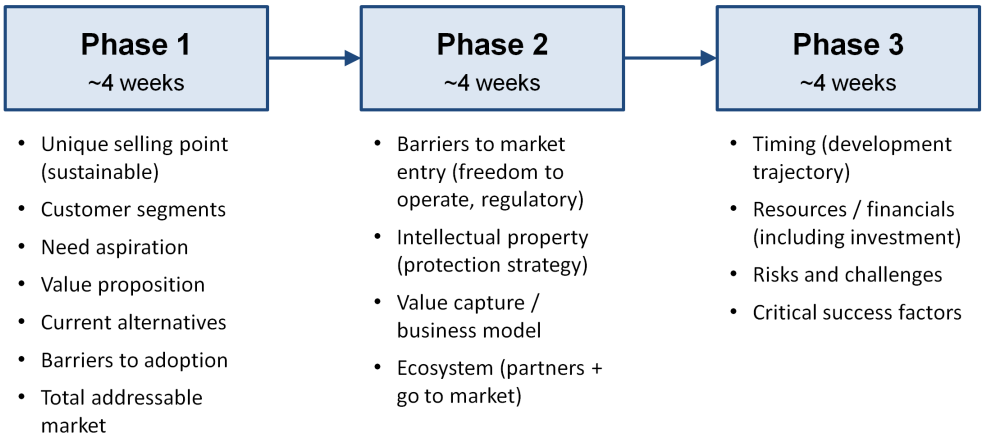

Figure 1. imec's structured 101 process and the areas of focus for each phase

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The second phase is crucial because it consists of the valorization team trying to validate the assumptions by conducting interviews with the different parties of the ecosystem addressed by the use case. In preparation for these interviews, a topic guide is drafted in close collaboration with the user specialists from the imec.livinglabs department. In parallel with the interviews to validate the Phase 1 assumptions, the team needs to come up with a clear view on intellectual property (including a protection strategy and freedom to operate), a business model, and an overview of the ecosystem (e.g., partners and go-to-market strategy).

During the second phase meeting, the team presents its findings from the interviews and its assessment of whether or not the assumptions have been validated. This presentation is a more precise version of the Phase 1 presentation, because it includes a first draft of their intellectual property assessment, business model, and ecosystem overview. After the discussion, one use case and an associated value-capture model and go-to-market strategy are chosen to be the most promising. At this stage, the project team and steering committee should have validated arguments on why certain valorization alternatives (e.g., spin-off, licensing to a third party) are better than others.

During Phase 3, the team needs to work out the timing, the resources, and the critical milestones needed to execute the business model and the go-to-market strategy. The result of Phase 3 is a final presentation and pitch that needs to be delivered to the different decision takers who will decide on further investment in the case.

Team composition

There is a threefold project team structure with a specific composition (Table 1). The core team consists of the imec researcher(s) that created the technology, together with the manager of the fund for industrial research, and one dedicated hands-on lead to coach the team. This core team executes all the research and reports to the extended project team at the end-of-phase meetings. The extended project team also includes the professor or supervisors from the researcher(s), a technology transfer representative from the university of the researcher(s), a business unit (BU) owner from imec, and experts with different backgrounds from the imec research institute (e.g., experts on user research and incubation). The different skills, network, and other assets of these team members can be used as required during the process. The decision team includes the imec C-level decision makers that eventually decide whether the project can continue after the 101 programme, what resources are dedicated to the team, and what direction should be taken (e.g., further research, spin-off, licensing). The steering committee gathers at the start, at the end of each phase, and at the finish of the 101 programme.

Throughout the process, there is regular reporting on findings and progress, and an evaluation is made at the end of each phase by the steering committee. After each phase, the team reports and presents its findings to the extended team. By also including the university technology transfer people, potential conflicts of interest are avoided, such as discussions over intellectual property or on the amount of time the researchers spend on the 101 programme. The in-kind funding consists of the support and coaching by the experts. There is also a limited imec budget of about €5,000 available to each team for travelling and other relevant expenses during the process.

Outcomes of the 101 Programme

The first pilot project that was carried out along the lines of the 101 process (or at least with the main principles)

Table 1. Composition of the 101 team

Core Team	Extended Team (Steering Committee)	Decision Team
• PhD/Post doctoral researcher(s) • imec coach • Industrial research fund manager	• Supervisors/professors • University technology transfer representatives • imec business unit owner • imec user research specialists • imec business experts	• imec management

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focused on Tengu, which is a platform to automate the setup of big data frameworks. Tengu was the result of research by an imec–UGhent PhD researcher. The technology surfaced during an iMinds' opportunity recognition workshop (ORW) in June 2015. The goal of these workshops is to help develop entrepreneurial and business skills by using and applying techniques and methodologies to real research results. After this three-day workshop, the PhD student wanted to undertake a more in-depth valorization of his research. At this point, the technology transfer office responsible for iMinds piloted a first version of the 101 process, which involved all stakeholders, a commitment of 1 day/week, a three-month timeframe, and clear deliverables. After these initial three months, the researcher applied for imec funding in February 2016. Although the first application was not successful, the jury was impressed by the quality of the file and encouraged the researcher to clarify some points of his business plan. A second application for funding in May 2016 was successful. The spin-off company Tengu was incorporated in July 2016, only 12 months after the researcher's first contact with imec's technology transfer office. Today, the Tengu team consists of 7 people and has made its first sales.

Having seen the need for and the effect of a follow-up program after a first introduction workshop, the imec TTO responsible further developed the programme and started four simultaneous 101 projects in January 2016, all of them having attended the November edition of the opportunity recognition workshop (ORW). This was done with the help of external consultants taking up the role as lead coaches. The closing meetings were attended by the senior management of iMinds who were impressed by the quality of the files. The only remark was that imec had all the necessary competences in house and it was not necessary to hire external consultants.

In light of the recent merger between iMinds and imec, and the installment of a product lifecycle process, the new imec organization wanted to test the 101 process in a more elaborate form. The main goal was to help prepare the teams for an investment decision. Figure 2 depicts the 101 programme within the broader imec technology transfer context.

A difference with the first 101 projects was that they did not come from the ORW, but were selected from a long list of 35 candidates, identified within the research institute, of which we eventually selected 10 projects to prepare an opportunity review (Gate 1). For the first execution of the 101 programme in the new imec organization, 4 teams participated in this programme alongside 6 other teams that also pitched at Gate 1 but did not follow the 101 programme. The jury was unanimous in thinking that the 101 teams pitched significantly better than the others. Their value propositions were much more concrete and their validation examples were more convincing.

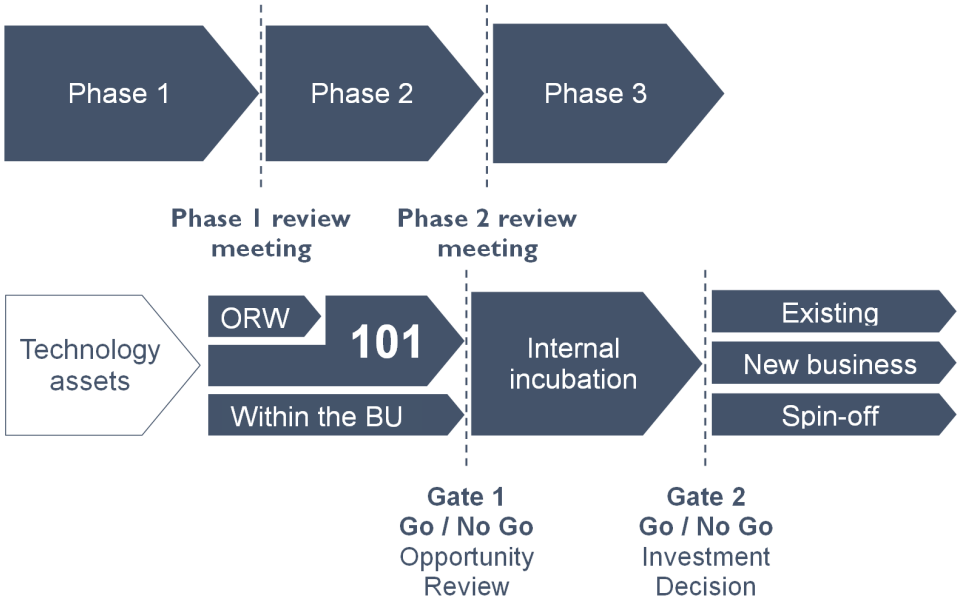

Figure 2. Technology transfer at imec, including the phases and positioning of the 101 programme

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One of these projects was called Quasar, which refers to technology that allows for all programmers to write code that can run on a graphics processing unit (GPU). GPUs are extremely fast for certain algorithms but are notoriously hard to program. Quasar makes it easier for researchers and developers to program and GPUs. Since 2013, the Quasar team had been looking for good ways to position its technology and to find a go-to-market strategy but had not been successful due to a combination of factors. It was decided to give the project a last chance to come with a strategy. Thanks to the revived enthusiasm, the heterogeneous extended team, and many structured interactions with potential users and customers, the project found a good niche market (in the automotive sector) and a first paying customer. The team shifted from the objective of starting a spin-off to an in-house research program within the industry.

Overall, the outcomes of the first 101 programmes are very positive. All four are continuing the entrepreneurial process: besides Quasar, a second project regarding an Internet of Things (IoT) solution is close to starting a spin-off, a third project is closing new licensing deals and has developed a strategic research programme to enable future technology transfer activities, and the fourth project is doing further investigations.

Evaluating outcomes

We conducted a survey of the four teams on the process and the 101 programme during the iteration that ran from December 2016 to February 2017. Twelve out of 26 respondents filled out the questionnaire. The support was given a score of 4 out of 5 by 72.7% of respondents, 18.2% gave the maximum 5/5, and 9.1% rated it at 3/5. On the question "Would you recommend your fellow researchers to take part in the imec 101 programme?", 100% (12) of the respondents said yes. Based on open questions, we discovered that the participating researchers believe they learned new skills and adopted a more entrepreneurial way of thinking. In particular, conducting interviews with potential customers took most of the researchers way out of their comfort zones. Therefore, the help of the coach and the user experts was needed in order to conduct these interviews effectively and translate the findings in terms of their value proposition and potential business model. This need was confirmed in an interview with an individual involved in technology transfer:

> *"The strongest part of the 101 process is the interviewing. This has to happen at an early stage. For academic researchers, some kind of a 'push' is needed in order for them to do this, as they are so busy with other work as well. Without this 'push', the majority will not engage in this market validation or potential customer exploration. The 101 process offers this kind of 'push', with concrete time pressure and deadlines. It is very intensive and difficult to combine with the other work, but it can offer a lot of value."*

Despite the short amount of time (12 weeks), a thoughtful investment decision can be made based on data gathered through the process. This timeframe allows for the organization engaging in technology transfer activities to "kill it faster"(if needed) and provide more focused investment in promising technologies and research. The time is short but the attention is focused, allowing the organization to quickly gauge potential. This approach yields more spin-offs, spin-outs, and flipped technology transfer, because the technology transfer budget and resources can be spent more efficiently.

Discussion: Lessons Learned

The 101 programme is designed to stimulate entrepreneurial action among academic researchers within the ecosystem of the imec research institute. The initial goal is the academic spin-off, but other options such as licensing are explored as well during the process. The programme does so by focusing on two specific aspects: a structured process and team composition.

The structured process, which is in line with the first five steps of Aulet (2013), allows the organization to identify the most promising markets and chose a primary "beachhead" market. To keep focus and structure, a business model brainstorm is held at the start of the programme, and the results from the consecutive research activities are reported within the frame of this initial workshop (see Rits et al., 2015). The research aims at need identification and market validation, combining the problem/solution fit and product/market fit stages, and is done through desk research and user interviews. It was exactly this structured approach that enabled Tengu to quickly accelerate the technology transfer activities where the foundation of generating a spin-off was laid in only three months. Related to the extended team composition, we also find support for the work of De Cleyn and colleagues (2015) given that the multi-disciplinary and multi-stakeholder teams had a positive impact on the project outcomes. By involving the universities, they felt more committed to the project and were more inclined to allow their researchers to dedicate time to it. The limited timespan of 12 weeks also fostered a positive attitude from, for example, the

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promoters of the researchers, because it did not distract them too much from their publishing duties. For the researchers themselves, the process allowed them to make a more deliberate choice between an entrepreneurial or an academic career. Also, the presence of the university technology transfer officers is mutually positive: the process helps them in their work, but they can also provide tailored assistance during the process given that they also tend to have a history with the participating researchers. Finally, the research institute itself also benefits because, in a limited amount of time, a data-based decision can be made regarding further investment. In this regard, the disadvantages of academic spin-offs, as identified by Smilor (1987), are overcome in the 101 programme. In the example of Quasar, it was clear that, by involving other experts and all stakeholders in the steering committee, the quality of the project increased significantly and the team could finally find a feasible go-to-market strategy. The interviews, which were facilitated by the different participating stakeholders, offered them the necessary data to choose a beachhead market for their technology. Without this help, the team was unable to focus for more than three years.

The 101 programme seemed to offer added value over a standard approach. The clear deadlines and deliverables, the involvement of all (internal) stakeholders in the process and the focus on (potential) customer exploration and validation were regarded as the strong points. By limiting the length of the process to only 12 weeks, a sense of urgency is created which forces the entrepreneurial teams into a constant battle between deep investigation and "quick and dirty" validation. This observation is in line with the principles of the lean startup by Ries (2011), focusing on quick experimentation and iteration of the value proposition. A very recent study by Frederiksen and Brem (2017) validated the majority of these principles and statements, and concludes that there is empirical and academic support for repeated, validated experimentation. The 101 projects only reach the exploration stage, but in theory, they should be ready to engage in an experimental mode at the end of the programme. An important element is the gate review meetings with C-level people to follow-up on the progress of the files. The involvement of these people generates commitment from their side and allows the projects to tap into their knowledge and resources. Through the clear tasks and deliverables for the different projects, these decision makers can more easily follow-up on the projects and decide to stop a project if not enough progress has been made or not enough commitment is present in the entrepreneurial team.

However, there are still several areas for improvement. One was an uneven knowledge of the process by the participating team members and stakeholders. In long-standing successful technology transfer activities such as at MIT (Aulet, 2013) or Fraunhofer (Rombach, 2000), the specific entrepreneurial process and approach are infused with most activities of the institution. At this moment, the 101 process is not well enough documented and is not known by most the researchers at imec, because it was a bottom-up approach taken by the initiative of those responsible for technology transfer. Also, in the current process, there is no "cohort effect" between the different teams, because they do not interact with each other. There was interaction between the internal imec support people, but for the researchers themselves, there were no formal interaction opportunities. Also, in terms of researchers, there seemed to be a lack of "leaders", or people who could actually take the lead in an eventual startup. The majority saw themselves in a supportive role, but not as the lead entrepreneur. Finally, related to this point, follow-up after the programme is also difficult. Given that the researchers have been less involved in their academic activities, immediately after the programme, they are expected by the university to re-engage with their previous activities. This expectation hinders the process of continuing towards the next stage of becoming a spin-off. However, by its open and bottom-up character, these issues will be dealt with in the next batch of projects entering the 101 programme.

Conclusion

Within this article, we have described the 101 programme, a structured technology transfer process in the early stages of opportunity discovery and entrepreneurial action, which is primarily aimed at academic spin-offs within the context of a research institute. Key elements in the programme are: i) a limited amount of time to complete the process, ii) a clearly structured process that is based on step-by-step exploration, and iii) validation of assumptions regarding primary markets, their needs, and the fit with the technological solution. Alongside the process, team composition is considered in a specific manner. By having a threefold team composition, relevant stakeholders and decision makers within the research institute and within the universities are involved, as well as business and user experts, to assist during the process. Involving key decision makers from the start increases the visibility and opens certain opportunities within the organization. The team structure also allows for the participants to source relevant knowledge and assets when necessary – without the

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need to have all these capabilities already in the core team. It also offers some freedom to the participants as to how they reach the deliverables linked to the three phases. However, future research and future work are still necessary. The follow-up after the programme needs improvement given that the risk remains high that researchers will fall back to their old routines after the programme, The programme also needs a stronger basis within the organization and should be implemented across the entire organization, as famous foreign examples such as Fraunhofer and MIT prove is important. Nonetheless, the 101 programme has shown a lot of potential with the first participating teams and confirms the literature that a process-based approach combined with focused team composition facilitate academic technology transfer.

The major contribution of the 101 programme lies in the combination of the three elements: the process, the team composition, and the coupling of a limited timeframe with regular follow-up meetings. By piloting and iterating the programme from a bottom-up perspective, the programme is able to create a fit with the overall goals of the organization and it also enables learning effects for the participants, who re-use the skills and knowledge obtained by their participation, as well as for the organization, where different people and profiles interact and get to know each other and the various assets and resources within the organization. Therefore, we see great potential in a structured technology transfer process and the possibility of experimenting with a technology-transfer initiative on even a very small scale.

About the Authors

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Sven De Cleyn graduated with a Master in Commercial Engineering and started his professional career at the University of Antwerp, where he conducted research on high-tech spin-offs from European universities. He joined iMinds (merged with imec since October 2016) in 2011 as Technology Transfer Manager. He is in charge of the imec.istart business acceleration program in which he supports new spin-offs and startups. The program is recognized by UBI Global as one of the leading accelerators worldwide. Today, Sven is also a part-time professor in (high-tech) entrepreneurship at the University of Antwerp.

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Effects of Business Model Development Projects on Organizational Culture: A Multiple Case Study of SMEs

Ulla Santti, Tuomo Eskelinen, Mervi Rajahonka,
Kaija Villman, and Ari Happonen

> *"Change is the law of life. And those who look only to the past or present are certain to miss the future."*
>
> John F. Kennedy (1917–1963)
> 35th President of the United States

Previous research has shown that links between organizational culture and innovativeness/performance may act as a "social glue" that helps a company develop organizational culture as a competitive advantage. In this study of three case companies, the organizational culture change due business model development projects is studied using the Competing Values Framework (CVF) tool and interviews with respondents about discovered changes. To reveal intervention and implied effects between business model development project and organizational culture changes, we used CIMO logic (context, intervention, mechanism, and outcome) to bridge practice and theory by explanatory, backward-looking research. Our case studies of companies in relatively short-duration business model development projects indicate that organizational culture may have some dynamic characteristics, for example, an increase of the adhocracy organizational type in all case companies or an increase in the hierarchical leadership type in one case company. Thus, the development of an organizational culture type can be partly controlled. Our results also indicated business model development projects do have a minor effect on organizational culture, even when development activities have not been put fully into practice. However, the more comprehensively business model development project activities have been put into practice, the larger the effect on organizational culture.

Introduction

Entrepreneurs tend to say it is more important for new employees to fit in with the group and the company culture than to have the best grades at university., For example, according to Macdonald, Assimakopoulos, and Anderson (2006), managers of small and medium-sized enterprises (SMEs) value an employee's natural ability and job experience more than their formal training . When a new employee starts to work in a firm, the first thing to learn is "how they do things" in terms of the firm's unspoken values, norms, and beliefs. In other words, the first thing to learn in a new job is organizational culture. However, researchers have faced complexity in defining organizational culture. In this work, organizational culture means organizational values, predictions, and beliefs in doing business (Barney, 1986; Schein, 1990) and shared perceptions of daily practices (Hofstede et al., 1990). In today's business world, employees are expected to have adaptability, skills and knowledge, and ability to solve complex problems with multiple methods. In general, anyone who has ever travelled knows the potential of our world's existing cultures in terms of understanding, communication, and the effects of culture on group work (Schein, 1985). Therefore, organizational culture and skillful employees are valuable resources in building a competitive advantage that is unique and difficult to copy by other companies because it is rare and imperfectly imitable (Barney, 1986; Chatman & Chen, 1994).

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Schein (1985) thought over 30 years ago that it is possibly the most important task of all to create and manage organizational culture and that the ability to work with culture makes the most talented leaders. Schein (1984) also had underlined the importance of understanding the dynamic evolutionary forces effecting cultural changes. "Corporate leadership and corporate culture have to be aligned to market realities to ensure the long-term success of a firm"(Koplyay et al., 2013). Researchers have highlighted the positive impact of organizational culture on the performance of organization (Deshpandé & Farley, 2004; Deshpandé et al., 2000), and identify those organizations having a culture favouring innovativeness and creativity as the most innovative in the market (Ahmed, 1998). The ability to adopt new knowledge is a precedent factor in improving an organization's innovativeness (Hult et al.,2004). Homburg and Pflesser (2000) found that market-orientated culture influences performance indirectly through market performance. Still, few organizations take advantage of internal marketing opportunities in predicting changes in their business environments, because they do not have this type of organizational culture (Gounaris, 2006). Today, renewing organizational culture is essential for businesses and especially it is a key aspect to innovativeness (Matinaro & Yang, 2017; Valencia, 2010).

Competitive and innovative cultural traits have a direct link with company performance, but the cultural traits of bureaucracy and leadership style do not directly relate to organizational performance (Ogbonna & Harris, 2000). Strong organizational culture and ability for transformation are connected to better performance, and, based on that, it is possible to predict short-term performance (Gordon & DiTomaso, 1992). The organizational culture may fuel the development of institutional processes (Tsui et al., 2006). Organizational culture develops over the years and stabilizes uncertainty, but once it has been created, it is hard to change within a short timetable without replacing the people in the group (Demers, 2007; Frost et al., 1991). Unfortunately, there are no convincing conceptual models that clearly demonstrate how the change happens at a deeper level and how behavioural change can ultimately lead to cultural change (Ogbonna, 1992).

The organizational culture consists of shared values, predictions, and beliefs concerning how to make the business successful and stabilize working life – and strong organizational culture affects both the innovativeness and performance of the company (Barney, 1986; Hofstede et al., 1990; Schein, 1990). Also, Schein's well-known model of building an organizational culture harnesses the effects of values in innovative behaviour (Hogan & Coote, 2014). And, recently, Guimaraes and colleagues (2017) listed 14 culture traits under four headings (organizational awareness, seeking improvement, goal achievement, and trust and cooperation) to measure cultures conductive to innovation. Also, Lakiza, Deschamps, and Brodeur (2017) found a complex relationship between organizational culture, performance measurement systems, and innovation capabilities, which would be important to investigate in organizational contexts. If we look at this the other way around and develop innovativeness and performance in the company by business model development project, new working methods and training for employees, we can consider the possibility that these development activities also have an effect on organizational culture. According to Ragan (2013), innovative thinking is possible to strategically "program" into organizational culture with clarity and discipline and by developing a culture that rewards experimentation and learning through doing. Thus, we can argue that organizational culture is likely to impact an SME's business model development project activities, which can then lead to changes in its organizational culture.

Any kind of change in relationships and connections between people and interpretations is a change in organizational culture, and the change is considered as uncontrollable evolutionary change from unlocked processes (Denison, 2007). To study what organizational culture means for SMEs when developing their business models, this study synthesizes research analyses based on data from the Pake Savo and Akseli projects. Our research hypothesis was that the specific underlying organizational culture changes due to influences of a business model development project. Based on case studies and a review of relevant literature, we argue that the relationship between organizational culture and putting business model development project activities into practice exists in changes in values and beliefs to make new things happen in organizations, and we argue that changes to organizational culture can be partly controlled.

In this study, we collected data using four questions based on the four value types (Figure 1) described by the Competing Values Framework (CVF) (Cameron & Quinn, 2006). The CVF has previously been used, for example, to examine the organizational concept (Dasmalchian et al., 2000), to diagnose organizational culture (Igo & Skitmore, 2005), to explore paradoxical leadership (Lavine, 2014), to study value perceptions and efficiency expectations in relation to organizational

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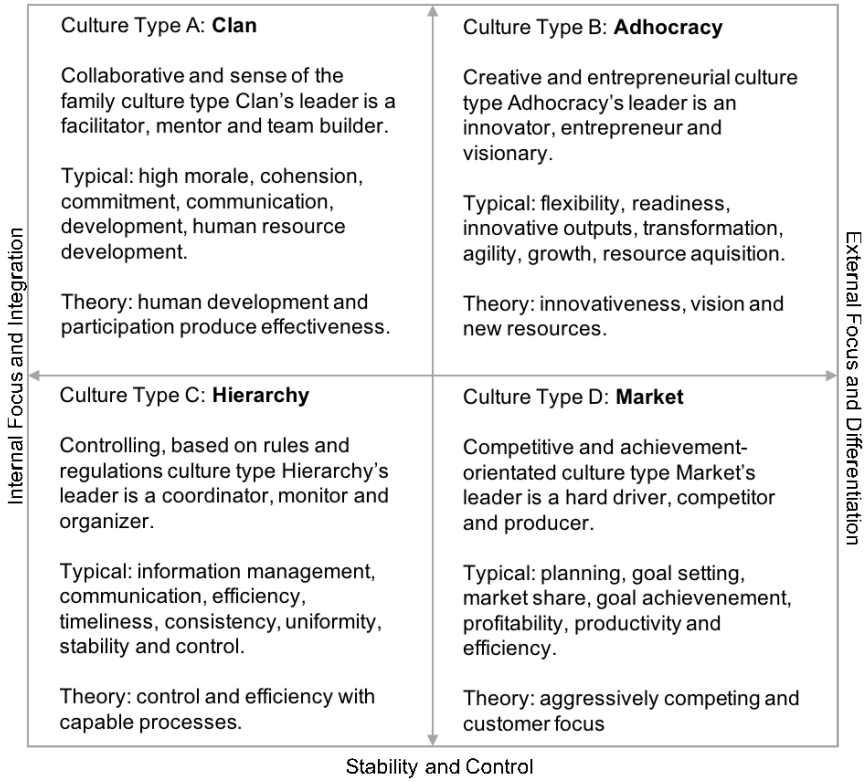

Figure 1. The competing values framework (CVF): values in leadership, effectiveness and organizational theory. (Adapted from Cameron & Quinn, 2006; Deshpande et al., 1993; and Yu & Wu, 2009)

commitment (Van Vuuren et al., 2007), and to examine how organizations can improve global strategic performance (Lincoln, 2010). In this study, the CVF is used to identify changes in organizational culture.

Organizational culture can act as a "social glue" – a force that holds an organization together (Smircich, 1983). This force of organizational culture can either advance or diminish creativeness and innovativeness in a company (Martins & Terblanche, 2003). Despite various definitions (e.g., Barney, 1986; Hofstede et al., 1990; Schein, 1990; Smircich, 1983), researchers tend to study cultural change based on as relatively superficial aspects, such as logos, ceremonies, and mission statements (Demers, 2007). This research purely concentrated on changes in organizational culture types based on the CVF (Figure 1).

The competing values framework (CVF) was originally developed by Quinn and Rohrbaugh (1981) to explain differences in competing values research (Denison & Spreitzer, 1991), and it has undergone further development by various researchers (Cameron & Freeman, 1991; Cameron & Quinn, 2006; Deshpandé et al., 1993; Quinn et al. (1991), and). The underlying idea in the CVF is that organizational culture is not homogenous but is instead a combination of competing values. There are four types: 1) a clan: a collaborative organization, with open team spirit; 2) an adhocracy: an entrepreneurial and creative organization with risk-taking and fast-moving ability; 3) a hierarchy: with coordinated processes and efficient operations; and 4) a market: with active focus on customers and competing aggressively in the market. A company's organizational culture is typically a combination, having features from all of these four culture types. As criticism, Hartnell, Ou, and Kinicki (2011) found varying relationships between three culture types and efficiency, together with how different strategies fit with certain culture types to attain competitive advantage. However, a factor analysis of 300 hospital managers has given convincing evidence of the CVF's reliability and validity (Kalliath et al., 1999). And it has been used in a variety of settings, including studies of organizational culture in European companies (Van Muijen, 1999) and managerial perceptions among Australian managers (Lamond, 2001).

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Using this framework, the respondent evaluates the situation before and after an intervention and determines whether changes in culture type have taken place. A questionnaire is filled in by the respondent during an interview focused on explaining the reasons behind any changes in culture type. Finally, we used CIMO logic (context, intervention, mechanism, outcome) (Denyer et al., 2008) to explore intervention effects and synthesize information from the practical project work. CIMO logic has been used in other studies to draw causal relationships between an intervention and the outcome within a particular context (Bougharas et al., 2010; Brouwer et al., 2012; Rajwani et al., 2015; Pries-Heje & Baskerville, 2010).

Research Questions and Methods

Our three research questions are as follows:

1. *Which organizational culture types prevail among the SMEs participating in the Pake Savo and Akseli business model development projects?*

2. *In which direction has the organizational culture of SMEs changed due to a business model development project?*

3. *Which business model development project activities have affected organizational culture, as evidenced by CIMO logic?*

We interviewed the management and employees of SMEs participating in two business development projects: Pake Savo and Akseli. There were six respondents altogether: two from case company 1 (Ergo-Kalusteet), one from case company 2 (Autorobot), and three from case company 3 (Chasswheel). We asked each respondent four questions (see Table 1) based on the CVF to assess their organizational culture before and after the project. If the respondent noticed some changes occurred in their organizational culture, we discussed these changes with them during the interviews to discover possible reasons why they might have occurred. For each question, respondents were asked to distribute 100 points across the four organization culture types by giving more points to the type that best described their organization, and fewer points to other types (Table 1).

The last phase is to draw cases together using CIMO logic to increase the practical relevance of solution-orientated prescriptive knowledge by problematic Context (C), Intervention type (I), generative Mechanism (M) and the Intended outcome(s) (O) (Denyer et al., 2008), to reveal interventions, implied effects, and effects on the case company's organizational culture. Organizational culture changes are not necessarily intended outcomes, but rather the needed side effect of business model development. CIMO logic is developed for structuring new and interesting means-ends propositions that help bridge practice and theory through explanatory backward-looking research (Holmström et al., 2010). In this study, the method is used to formulate explanations for how interventions produce outcomes in the Pake Savo and Akseli business model development projects.

Business Model Development in the Case Companies

The objectives of the Akseli and Pake Savo projects were to increase effectiveness of work processes, modernize the SMEs' business models, and encourage customer orientation by involving customer into development processes, for example product development. The Service Logic Business Model Canvas works particularly well as a discussion tool in creating a more customer-centered business culture because it places the customer at the centre of all elements in the business model canvas (BMC) (Miettinen, 2017). Both projects included an innovation process based on the InTo business model analysis tool (into.savonia.fi) (see Kajanus et al., 2014), which has six phases (Eskelinen et al., 2017; Kajanus et al., 2014):

1. Context and goal design

2. Idea generation and collection

3. Idea collection into the InTo web-based innovation tool

4. Idea evaluation according to evaluation criteria with InTo

5. A core index decision-making analysis to prioritize ideas

6. Selection of the best ideas to progress toward the goal defined in phase 1

Pake Savo was a joint project of the South-Eastern Finland University of Applied Sciences XAMK and the Savonia University of Applied Sciences, which included 25 participating companies. The project aimed at helping SMEs located in the Northern Savo (Eastern Finland) region to start or develop their service business. The Pake Savo project arranged two training packages on service business design for the SMEs. In addition to

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Table 1. Questions used for the classification of organization culture before and after the project (based on Deshpandé et al., 1993). For each question, respondents were asked to distribute 100 points across the four types.

1.	***Type of organization*** *(Please distribute 100 points)*	
A)	My organization is a very **personal** place. It is like extended family. People share a lot of themselves.	C) My organization is a very **formalized and structured** place. Established procedures generally govern what people do.
B)	My organization is a very **dynamic** and entrepreneurial place. People are willing to stick their necks out and take risks.	D) My organization is very **production orientated**. A major concern is with getting the job done, without much personal involvement.
2.	***Leadership*** *(Please distribute 100 points)*	
A)	The head of my organization is generally considered to be a **mentor, sage or father/mother figure.**	C) The head of my organization is generally considered to be **coordinator, an organizer, or an administrator.**
B)	The head of my organization is generally considered to be **entrepreneur, an innovator, or risk taker.**	D) The head of my organization is generally considered to be **a producer, a technician, or a hard-driver.**
3.	***What holds the organization together?*** *(Please distribute 100 points)*	
A)	The glue that keeps my organization together is **loyalty and tradition.** Commitment to this firm is high.	C) The glue that holds my organization together is **formal rules and policies.** Maintaining a smooth-running institution is important here.
B)	The glue that holds my organization together is **commitment to innovation and development**. The goal is to be the first.	D) The glue that holds my organization together is **accomplishment at tasks and goals**. Production orientation is commonly shared.
4.	***What is important?*** *(Please distribute 100 points)*	
A)	My organization emphasizes **human resources**. High cohesion and morale are important.	C) My organization emphasizes **permanence and stability**. Efficient, smooth operations are important.
B)	My organization emphasizes **growth** and **acquisition of new resources**. Readiness to meet new challenges is important.	D) My organization emphasizes **competitive actions** and **achievement**. Measurable goals are important.

participating in the training sessions, the companies carried out individual development projects on each company's service business. In these development projects, the participants learned to apply the service design methods and the business model approach to their companies. Several of the participating SMEs applied a service design approach in their company to develop new innovative products and services. Many of the companies used the InTo business model analysis tool (Kajanus et al., 2014) to select the development project or to prioritize key development targets. The development projects implied that the shift from a product-oriented company to a customer-or service-oriented company cannot succeed without a significant change in the organization's culture (Eskelinen et al., 2017). Two of the case companies in this research project were participants in the Pake Savo project.

The Akseli project was to help SMEs develop their business models in the Northern Savo area based on their business needs. Therefore, the results from company 1, Ergo-Kalusteet, reflect the needs and visions of the participating growth/development-orientated SMEs. Seven SMEs participated in Akseli project development activities with two main tools: extended business model canvas presented in Kajanus and colleagues (2014), which

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has company solution and competitive solutions added to the business model canvas and the InTo business model analysis tool (Kajanus et al., 2014) to discover and evaluate development ideas together with employees, management, and customers. Internet marketing and social media development activities were discovered in many participating SMEs. Based on that finding, they were provided with consulting and Internet marketing training sessions, which included social media training.

Results and Discussion

Case company 1: Ergo-Kalusteet

Case company 1, Ergo-Kalusteet (www.ergo-kalusteet.fi) has operated a furniture business since 1988 and has gained extensive expertise in design, production, and materials (e.g., wood, plastic, and especially corian, a hygienic surface material). Constant training and modern equipment keeps the company competitive in their field. "Our objective was to develop our internal communication to make our manufacturing and marketing departments more co-operative and efficient", stated the Chairman of the Board. Our results for this case company clearly show there was major influence made by the intervention, and the development activities have mostly been successfully put into practice in the organization (Figure 2). Ergo-Kalusteet has ambitious intentions to grow, and their expansion has already started, with new investments raising the risk level, which explains some of the growth of the adhocracy organizational culture type. Job descriptions became clearer and operations became better organized after the intervention, therefore the hierarchy culture type increased, becoming the second major culture type in the company (Figure 2). Respondents also commented that employees' commitment had increased because of clearer work tasks with better and timely instructions. The development of a communication culture changed many, even unexpected things for better direction. For example, they found they were better able to organize production, communicate openly, and share personal issues, while also communicating more formally. "Cultural change may have been bigger for senior employees, although it was also a big change for the younger generation, because we were not used to using these communication tools at work even though we use them constantly in our free time," stated the production manager from the case company.

Case company 2: Autorobot

Product development has been the foundation of Autorobot (www.autorobot.com), which manufactures and markets collision repair equipment and measuring systems. This 48-year-old family-owned business has around 100 patents and exports to 70 countries worldwide. The company participated in the Pake Savo project to learn more about service design thinking to progress customer orientation in its processes, improve internal communication, and support other development projects to modernize its production and machinery. The Pake Savo project provided training and coaching, business model and service design with Savonia Innovation Tool (InTo), and consultancy for opening a webstore.

"Pake Savo training and small group coaching gave us a different view to modernize operations and also new ideas we would never thought of, and especially InTo brought new excitement for us," stated the marketing designer of the company, who also credited the employees' long work history (20–30 years) for bringing them together as a team. Autorobot has a need to become more of an adhocracy type of organization and less of the hierarchy type, which has clearly, with small impact, happened due its participation in the business model development project (Figure 3).

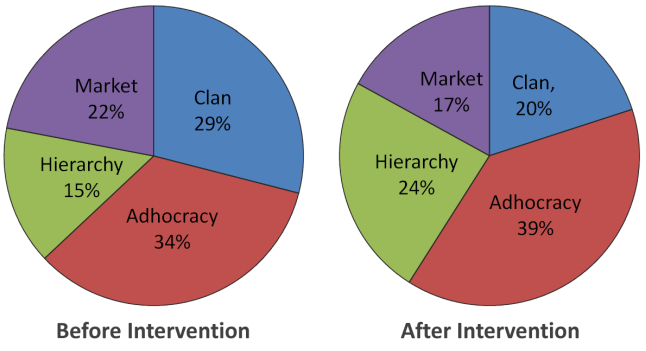

Figure 2. Ergo-Kalusteet culture types before and after intervention

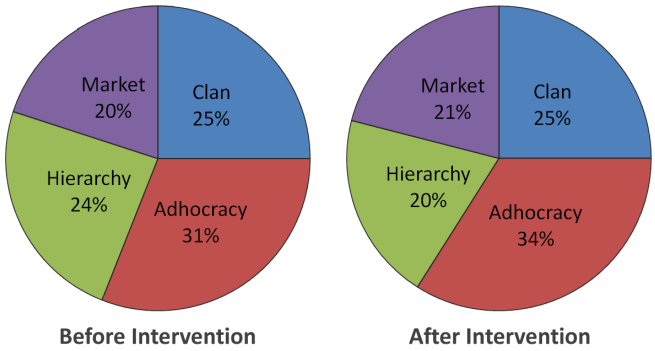

Figure 3. Autorobot culture types before and after intervention

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Case company 3: Chasswheel

Since 1995, Chasswheel (chasswheel.com) has made electric wheelchairs that are now sold in 10 countries. Its products feature a durable and flexible "Four X" chassis solution that allows the end user to stand, drive, and even cross over small obstacles at the same time (Figure 4).

Figure 4. A Chasswheel multifunctional electric Four X wheelchair

Chasswheel participated in the Akseli project to find innovative ideas to develop its business model and generate ideas for sales and marketing. "We have a lot of enthusiasm and ideas for business model development project activities. Social media appeared as the most important marketing channel to reach our end users and spread our word forward," said the company's CEO. In the Akseli project, SMEs received consultation for business model development from Lappeenranta University of Technology and Savonia University of Applied Sciences, and a training session to develop skills and knowledge for Internet and social media visibility based on the results from the idea-screening process. With business model development activities, Chasswheel started to pursue a transformation from manufacturing towards sales and marketing and learned about the opportunities provided by social media in terms of getting closer to their products' end users. They also gained improved employee commitment and belief in the company's future success. All respondents from this case company mentioned that even more changes could have been finally put into practice because of the potential of a good plan, but crucial everyday operations took attention away from final the business model development. Organizational culture was wished to be improved in goal orientation, self-direction, internal communication, customer orientation, and innovativeness. Clan culture is considered as a strong and leading force that holds the organization together, and it did increase due to the Akseli project. The market culture type decreased, which can be explained by challenges in production, and which reflected the company's ability to meet the customer needs in delivery schedules at that time (Figure 5).

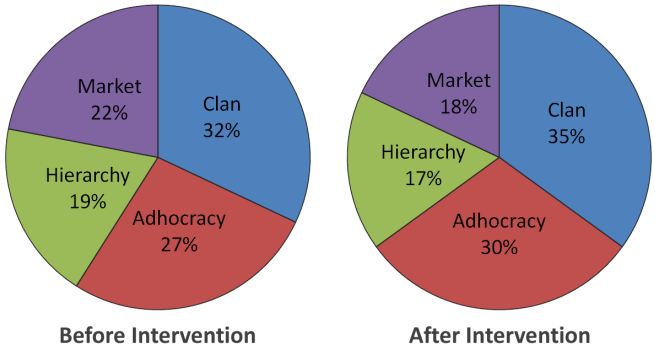

Figure 5. Chasswheel culture types before and after intervention

Chasswheel continued development activities after the Akseli project by reorganizing production and increasing connections with end users through social media channels, which may affect the market organizational culture type in the future.

Business model development activities affected organizational culture

The activities of the Pake-Savo and Akseli projects were evaluated together according to CIMO logic, as summarized in Table 3, which shows how each company sought to find new ideas and solutions. Ergo-Kalusteet clearly focused more on developing internal communication by making communication processes more structured with mobile applications, which shifted their organization toward the hierarchical culture type. Autorobot also prioritized internal communication and the outcome was a list of future actions related to internal communications. New ideas and support from an external team seemed to influence the shift toward the adhocracy culture type, making the organization more entrepreneurial with increased risk-taking, responsiveness toward new ideas, and increased readiness for innovation. In Chasswheel, the identification of new ideas led to an increase in the adhocracy culture type. A new tool was put into the development process and social media marketing campaigns and actions were put into practice. In all these case companies, the leading organizational culture type was increased by the business model development project.

Conclusion

The case studies revealed the non-statistical nature of organizational culture even in a short time frame (measured in months, not years). This means that the culture has dynamic characteristics that are affected by

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Table 3. CIMO logic (cf. Denyer et al., 2008) applied to the participative business model development processes of the three case companies: Ergo-Kalusteet, Chasswheel, and Autorobot (Eskelinen et al., 2017)

	1. Ergo-Kalusteet	2. Autorobot	3. Chasswheel
Context	Company offering tailored wood and composite-based products, e.g. acoustical elements for loudspeakers. Challenges in developing internal communication between production, marketing, and delivery of products.	Company designs, manufactures. and markets repair equipment and measuring systems for repairing collision-damaged vehicles. Challenges between internal communication production, marketing and sales departments.	Company designs and manufacturers all-terrain electric wheelchairs. Challenges in sales and marketing. Has a regular customer basis and sales channels in Europe.
Interventions	Business model development process to find new ideas and solutions.	Development process to find ideas and solutions to develop internal communication.	Business model development process to find new ideas and solutions.
Mechanisms	A business model development process: context definition, idea creation with interviews and web link, multi-criteria idea evaluation with a web based tool, portfolio analysis of results and workshop	A development process with six questions on challenges in internal communication, idea creation in a workshop, external expert visit to accelerate creation of new ideas, idea evaluation with a web tool, multi-criteria evaluation of ideas, portfolio analysis and a results workshop.	A business model development process: context definition, idea creation with interviews and web link, multi-criteria idea evaluation with a web based tool, portfolio analysis of results, workshop and internet marketing training.
Outcome	Two solutions were identified and put into practice. A WhatsApp application was tested and found useful.	Prioritized list of actions. A decision was made to improve, test and pilot an internal communication system.	New ideas identified with social media marketing actions. A wheelchair planning tool is in development.
Organizational Culture Effects	Changes in all culture types. Leading culture type adhocracy increased 5 percentage points, in line with their growth intentions. Hierarchy type was minor type before intervention and increased 9 percentage points becoming second major culture type (larger than expected change). Communication development increased formality. Clan decreased 9 percentage points and market 5 percentage points.	Minor changes. Leading culture type adhocracy increased and minor culture type hierarchy decreased. Changes were welcomed by the company.	Minor changes in all culture types. Leading culture type of clan increased 3 percentage points, as well as adhocracy, which was a desired change. Hierarchy decreased 2 percentage points and market decreased also 4 percentage points.

new participants and enthusiasm due to project work. The organizational culture type effects may occur even due to short-term project work, the aim of which was to develop business models or business model service design. Effects on organizational culture were identified even though development plans were not entirely put into practice, so the effects do not represent the full development results. However, the results do indicate that change to an organization can occur early based on experience gains when the company is undergoing efforts in pursuit of change. We must consider also the positive effects of coaching (Fillery-Travis & Lane, 2006) and increased motivation and knowledge due to teamwork (Mudambi et al., 2007), which causes the effect in

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our case studies results coming from working together as a team. The effects are results of working together and getting inside (tacit) knowledge of co-workers' values, ideas, and visions, which is also supported by Chen and Huang (2007), who showed that social interaction is positively related to knowledge management, and a study by Mathieu and colleagues (2000), who showed a fully mediating relationship between mental model and team effectiveness. Thus positive results generate new and improved atmosphere into the organizational culture or vice versa. However, the business model development project's effects on organizational culture were larger, once development activities were farther along.

In all the cases, the development of organizational culture took the direction towards the company management's preferred culture types. Therefore, organizational culture development may be partly controllable according to respondents with collaborative business model development project activities as idea development, training sessions, and team meetings for putting development activities into practice. Based on this result, we recommend restricting development activities more towards the most wanted culture type and to prioritize putting business model development project activities into practice to have the best possible impact. However, this study would benefit from a larger set of quantitative employee interviews. After all, if the management wishes for a certain type of change, they may see the change in the way they prefer (and respond accordingly during interviews). However, employees might have a different view, particularly if many are interviewed to overcome any management bias.

Business model development projects will not immediately change the organizational culture type, but those development activities can sow the seeds of change. For further research, we recommend studying whether these organizational culture changes are short-term changes or will develop further in the direction desired by company management. Another future research theme could identify which support actions are needed to lead a company towards certain organizational culture types.

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Keywords: organizational culture, competing values framework, development project, SME, business model, business model canvas, service design

The Sharing Economy and the Future of Personal Mobility: New Models Based on Car Sharing

Olga Novikova

> *"You cannot separate the buildings out from the infrastructure of cities and the mobility of transit."*
>
> Norman Foster
> The Rt Hon. The Lord Foster of Thames Bank, OM
> Architect

The sharing economy is an emerging phenomenon that shapes the cultural, economic, and social landscape of our modern world. With variations of the concept of the sharing economy emerging in so many fields, the area of shared mobility – the shared use of a motor vehicle, bicycle, or other mode that enables travellers to gain short-term access to transportation modes on an on-demand basis – has developed as the forerunner of the transformation to be expected in other areas. This article examines how the sphere of personal mobility has been affected by the growth of sharing economy. It contributes to the growing body of shared mobility literature by uncovering innovative mobility-based models that represent solutions on the intersection of shared mobility, physical infrastructure, and integrated-mobility schemes.

Introduction

During the last decade, the concept of the sharing economy has entered various industries and has altered numerous aspects of daily life. The general notion of sharing within the society is not new (Belk, 2007, 2010, 2014), however, the evolution of the Internet has enabled sharing to spread beyond the local interaction and facilitated connection between vast amounts of individuals (Belk, 2014; Botsman & Rogers, 2010; Hamari et al., 2016).

Various definitions of the sharing economy have been put forward in recent years, however, no single description has been widely accepted by research and practitioner communities (Botsman, 2013). For example, Botsman and Rogers (2010) broadly define the sharing economy or collaborative consumption as "traditional sharing, bartering, lending, trading, renting, gifting, and swapping, redefined through technology and peer communities".

Applications of the sharing economy concept have found their way into various areas. In the area of production, the sharing economy is manifested in the design, production, and distribution of goods through collaborative networks, with examples including the TechShop (techshop.ws) workshop and fabrication studio and the Quirky (quirky.com) invention platform (Bauwens et al., 2012; Botsman, 2013). In consumption, it means maximizing the utilization of assets through efficient models of redistribution and shared access, as seen with the Zipcar (zipcar.com) car-sharing service, Airbnb's (airbnb.com) accommodation marketplace, and the Lyft (lyft.com) transportation network (Botsman, 2013). In finance, the collaborative economy means person-to-person banking and crowd-driven investment models that decentralize finance, with examples including the Zopa (zopa.com) peer-to-peer lending platform and the Kickstarter (kickstarter.com) funding platform for creative projects (Botsman, 2013; Owyang & Samuel, 2015). In education, the collaborative economy implies open education and person-to-person learning models that democratize education, with examples including the Coursera (coursera.org) online course platform and the Skillshare (skillshare.com) online learning community (Bauwens et al., 2012; Botsman, 2014).

With variations of the concept of the sharing economy emerging in so many fields, the area of shared mobility – the shared use of a motor vehicle, bicycle, or other mode that enables travellers to gain short-term access

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to transportation modes on an on-demand basis – has developed as the forerunner of the transformation to be expected in other areas (Le Vine & Pollak, 2015; Shaheen & Chan, 2016). Thus, there has been a growing interest in the topic among researchers of mobility in recent years. Researchers have focused their attention on the evolution of car sharing (Shaheen et al., 2015), the technological aspects of the car-sharing market (Zoepf & Keith, 2016), the behaviours and motivations of carpooling service users (Shaheen et al., 2016), mobility business models for the sharing economy (Cohen & Kietzman, 2014), and the concept of mobility as a service (Expósito-Izquierdo et al., 2017), among other topics.

Whereas research to date has focused on the existing characteristics of shared mobility, there is lack of understanding of what kind of new mobility models emerge with the advance of the sharing economy. It is also unclear what solutions appear on the intersection of shared mobility, physical infrastructure, and integrated-mobility schemes. This study attempts to uncover the emerging innovative mobility models, based on the interviews collected with mobility experts, business owners of car-sharing companies, and users of shared mobility solutions.

This article is structured as follows. First, it gives an account of research on car-sharing, ride-sharing, and other shared mobility modes. Then, based on the data collected for this study, it showcases new models emerging on the intersection of the sharing economy and the traditional economy. Finally, it offers a model illustrating an integrated mobility solution.

Mobility in the Sharing Economy

One of the perhaps most recognized and widespread applications of the sharing economy has emerged in the area of personal mobility through car sharing (Botsman & Rogers, 2010; Cohen & Kietzman, 2014). As with sharing itself, car sharing is not a new phenomenon. Car sharing emerged in the 1950s when membership was primarily motivated by economics (Shaheen et al., 1998), and it has since continued its worldwide growth (Shaheen & Cohen, 2007). With car sharing, individuals gain the benefits of using private cars without the costs and responsibilities of car ownership (Shaheen et al., 1998). Thus, instead of owning one or more vehicles, a household accesses a fleet of vehicles on an as-needed basis. Car sharing may be thought of as organized recurring short-term car rental. Individuals gain access to a car-sharing service by joining organizations that maintain a fleet of cars in a network of vehicle locations. Generally, participants pay a modest fixed charge plus a usage fee each time they use a vehicle (Shaheen et al, 1998; Shaheen & Cohen, 2013). The impacts of car sharing can be categorized as environmental, land use, social effects, and transportation (Shaheen & Cohen, 2013).

Several possible typologies of car sharing have been identified (Bauwens et al., 2012; Cohen & Kietzman, 2014; Shaheen et al., 1998). For example, Bauwens (2012) differentiates between peer-to-peer car sharing, business-to-consumer car sharing, and non-profit cooperatives. Peer-to-peer (or consumer-to-consumer) car sharing implies that the fleet of cars is owned by a community. The marketplace then matches cars that are available by the owners with the prospective drivers willing to rent them. Companies such as Turo (formerly RelayRides), Getaround, and JustShareIt offer examples of peer-to-peer car sharing. Business-to-consumer car sharing means that a company owns a fleet of cars and facilitates the sharing among members. Auto manufacturers (e.g., BMW, Peugeot, Daimler), rental brands (e.g., Hertz, WeCar), and car-sharing brands (e.g., Zipcar, StattAuto, GoGet) offer examples of business-to-consumer car sharing. Nonprofit cooperatives (or public initiatives) involve a local organization or community that facilitates car sharing with the goal of changing driving habits over making a profit. Organizations such as City Car Share, PhillyCarShare, and Autolib are examples of such initiatives.

Another case of sharing economy that shapes the personal mobility space is ride sharing (or ride hailing – vehicle owners allowing other passengers to ride in the same vehicle to and from the same or similar destinations), with Uber being the most prominent example of a platform enabling peer-to-peer transactions (Cohen & Kietzmann, 2014). Similarly, various dynamic ride-share systems aim to bring together travellers with similar schedules and itineraries on short notice. As Agatz and colleagues (2012) note, new dynamic ride-sharing systems have the potential to provide significant societal and environmental benefits by reducing the number of cars used for personal travel and improving the utilization of available seat capacity.

Overall, three factors seem to contribute to the ongoing worldwide growth in shared-use vehicle membership: i) cost savings; ii) convenience of locations, use, and access; and iii) environmental awareness (Shaheen & Cohen (2013).

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Method

The author studied sharing mobility solutions as part of a larger project examining an emerging electric vehicle ecosystem in Finland. In the first stage, the author collected documents and media material to identify the actors involved in shared mobility and to understand their roles.

In the second stage (March 2012 – August 2013), the author conducted 32 open-ended interviews with a car-sharing organization and actors that were the most relevant with regard to the shared mobility solutions, including car-sharing service users, business owners, and mobility experts. In the third stage (March 2012 – May 2014), the author assessed additional documents and media reports to ensure continuous support for ideas development.

The qualitative nature of the study implies its limitations in scope, scale, and replicability. However, it helps shed light on the emerging and previously not captured phenomena in the fast developing field of the sharing economy. Despite its relative maturity, the collected data is still relevant as it projects the anticipated future mobility models.

As typical in qualitative research, the data analysis consisted of multiple iterative and overlapping phases (Yin, 1994). In the first phase, open coding of the interviews was carried out in order to identify important issues relating to mobility solutions in the sharing economy. This helped to identify the new emerging models and a version of an integrated mobility solution after coding more systematically in phase two.

Findings and Discussion

The present study has identified several innovative models in the space of shared mobility. They combine existing actors in the sharing mobility space and the traditional economy in a novel manner and present an attractive opportunity for future service providers. The findings are summarized in Table 1.

For existing car manufacturers, the sharing economy space offers interesting solutions, such as "lease-to-share" model, whereby a system is created for a leased vehicle to be seamlessly integrated into a shared mobility mechanism. Also, the car-sharing business model for car-manufacturers offers an attractive intermediate solution to address a growing trend of not owning a car. Another noteworthy model emphasizes collaboration between mobility providers with actors in a non-mobility space, such as real-estate developers, whereby the shared mobility solutions are taken into consideration before constructing commercial or residential properties. New technological advances, such as self-driving cars will bring about flexibility, or, as one of the interviewees put it "fluidity" in the mobility system, whereby the new system will be private in terms of user experience and public in terms of system access. Finally, the industry will see a change toward offering integrated mobility schemes and systems versus current individual mobility solutions.

Based on the interviews, three factors appeared to be crucial in affecting the choice of mobility solution:

1. *Time:* defined as total time taken to accomplish a trip
2. *Cost:* defined as total cost of a trip
3. *Convenience:* defined as a perceived convenience of a trip

An integrated mobility solution provides an on-demand single-point-of-purchase tool that will enable a user to reach a desired destination by using any combination of transportation modes, such as public, private, and shared vehicles. The architecture will take into account a user's preferences in terms of time, cost, and perceived convenience of the trip. Furthermore, the variety of payment systems (for example, pre-paid or pay-as-you-go) can be integrated to serve the needs of individual users.

New technological mobility systems may provide significant societal and environmental benefits by reducing the number of cars used for personal travel and improving the utilization of available seat capacity. Technology will play a major role in matching needs and requirements of drivers and riders in real time (Agatz et al., 2012). It will also play a major role in providing a seamless solution for a traveller who would be able to choose a trip based on their preferences regarding time, cost, and convenience while integrating public, private, and shared modes of transportation.

Conclusion

The sharing economy has been affecting various spheres of our daily lives, and it has made notable progress in the field of mobility services. This article contributes to the growing body of shared mobility literature by uncovering innovative mobility-based

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models that represent solutions on the intersection of shared mobility, physical infrastructure, and integrated-mobility schemes. Furthermore, an outline of an integrated mobility solution where three factors influencing a user's choice of mobility mode – time, cost, and perceived convenience of the trip – are incorporated into a scheme with public, private, and shared modes of transportation, is presented as a technological answer to the future transportation challenges.

Table 1. New models based on sharing

Type	Description	Source
Lease-to-share model	"'Lease to share' as a car-sharing model is based on leasing. It is you and me leasing the car and subletting unused capacity. We are driving new cars, but we are getting them at a much more attractive rate. You are not responsible to carry the full depreciation load yourself, but you are sharing it with the group of people who are sharing cars. It makes a lot of sense, because we are getting out of an ownership model that has implications for leasing as you can be more flexible with a leasing contract than with owning car."	Expert
Car-sharing business model for car manufacturers	"The dynamics are different – big players such as Mercedes-Benz, BMW... Fiat is planning their own car, VW launched their own car – it is an industry for car manufacturers, and will be through electric cars. The key word is 'car sharing' – they will provide car sharing in different cities and different countries, car sharing with electric cars. And car sharing will be the first point for the consumer to get to know the product, and later buy one if needed."	Business owner
Collaboration of car-sharing companies and real-estate developers	"For the premise owners, big office buildings, there is a constraint of parking space, so with a sharing scheme, they can offer mobility to the tenants and it adds more value to the premise itself."	Business owner
	"It is a new model. When you buy or rent in a house, there is a service fee, which you have anyway, but in this service fee it is included that there is an electric car in the basement that can be used via shared calendar with other inhabitants. So you know that you don't necessarily need your own car, or you at least don't need a second car."	Business owner
Self-driving car – an end to classic car sharing or peer-to-peer sharing	"Starting with a long-term vision: the self-driving car, to some extent it is an end to classic car sharing and the modern way of peer-to-peer car sharing that has come up now. Self-driving car means that you can just hire a car, with your cellphone, just like you hire a taxi. It will come, and it will be electrically powered. It will come, pick you up, drop you off somewhere. If you need to go somewhere else, another car will come, pick you up, drop you off. So it is a very fluent public transport system, that is individual enough so that you can sit there only with your friends, only by yourself, but it is also public enough so that you can access it from everywhere."	Expert
New mobility schemes	"In the medium term, car manufacturers will benefit from the emerging markets, but there will be a change in the car industry. The car is losing its status symbol in some parts of the world, and it is becoming means of transportation. Now the industry is turning into selling mobility schemes instead of cars, and the impact of e-mobility is one of the components of the whole industry-wide change."	Expert
Future integrated mobility model	"In the future, car ownership and public transportation are maybe not so separated. The talk is about the travel chain, which means: range of cars, different sizes, maybe also big trains where one can drive small cars. So transportation is becoming flexible."	Expert

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Olga Novikova is a researcher and PhD candidate at Hanken School of Economics in Helsinki, Finland. Previously, she has worked on a variety of research projects from electric mobility to business model innovation. Her current research interests are the emergence and implications of the sharing economy. She has also co-founded Experience Living, a hospitality company in the sharing-economy space. Most recently, she has co-founded Good TV, a global mobile channel with a focus on inspiring, educational, and entertaining content.

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How Researchers Use Social Media to Promote their Research and Network with Industry

Päivi Jaring and Asta Bäck

> *"We don't have a choice on whether we do social media, the question is how well we do it."*
>
> Erik Qualman
> Author and speaker

Social media is now an essential information and interaction channel. Companies advertise and sell their products and services through social media, but this channel has not been so commonly applied to the task of selling knowledge and research work. This article studies the use of social media by researchers to promote their research and network with product developers in industry, and it presents a model of the use of social media by researchers. The data for this research was obtained by interviewing individual researchers of a research organization and surveying product developers from industry. The findings show that social media is seen as a good source of new information and contacts, and it is suitable for promoting awareness of research services and results. The results show that the speed and intensity of social media present challenges for researchers, but by being active in posting content and participating in discussions, researchers can derive benefits and enhance their personal reputations.

Introduction

Social media has become a popular and easy-to-access way for customers to find information before committing to a specific buying decision (Tenhunen, 2017). Social media employs "mobile and web-based technologies to create highly interactive platforms via which individuals and communities share, co-create, discuss, and modify user-generated content" (Kietzmann et al., 2011). Categories of social media services include social networking (e.g., Facebook, LinkedIn), microblogging (e.g., Twitter), blogging, photo sharing (e.g., Instagram, Pinterest), video sharing (e.g., YouTube), and crowdsourcing. Successful adoption of social media can increase companies' turnover (Tsimonis & Dimitriadis, 2014) and have an impact on their reputation or even survival (Kietzman et al., 2011). An organization can be present in social media at different levels: as individuals, teams, projects/topics, and as the whole organization. However, given that social media is person-centric, it gives users the opportunity of "personal branding" – the distinctive presentation of a person's character and capacity (Lair et al., 2005).

The use of social media in business has been intensively studied, but the focus has been much more on the business-to-consumer (B2C) sector than the business-to-business (B2B) sector (Michaelidou et al., 2011). The key differences between B2B and B2C marketing are that B2B markets often deal with high-value and complex products that are marketed to knowledgeable decision makers and that B2B marketing requires more intense, long-term personal relationships between the buyer and seller than what is typical in the consumer market (Table 1).

A special case of B2B is selling research to industry, because often there is no concrete product or service, only existing competences. The role and opportunities for using social media in enhancing research-to-business communication and transferring research results to industry have been researched only in few studies (e.g., Mauroner & Fauck, 2014). Most universities and research institutes use social media to some extent, but its true potential is unclear. Close collaboration between a research institute, its researchers, and industry is important also for the society, because the

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Table 1. Differences between B2B and B2C marketing (Habibi et al., 2015; Jussila et al., 2014; Urban et al., 1993)

Features of B2B vs. B2C Marketing	Impact
Larger number of decision makers and purchase influences	B2B marketers must consider a greater number of communication channels and messages. Finding the key decision maker is a challenge.
Slower decision-making cycle	The length of the purchase funnel must be recorded in B2B for each decision maker to match resources with potential purchases.
High-value exchange; more complex products	B2B purchasers rely more on direct and intense personal relationships and sales contacts than on advertising. Different messages are needed for different decision makers.
Higher level of risk due to high-value purchases and product complexity	B2B buyers are more rational and knowledgeable in decision making.
More functional, rational, or utilitarian decision-making criteria	The message and media of B2B sales should rely on factual information.

quicker the research results are commercialized, the bigger the benefits are to the companies and the society (Komssi et al., 2016). Therefore increasing understanding of how social media can be used efficiently is worth researching.

Research Problem, Method, and Case Organization

In this article, we study the use of social media by researchers from research institutes to promote their research and network with industry from the perspectives of researchers and potential customers.

Our overall research question is:

> *What is the role of social media in connecting researchers, research institutes, and companies?*

However, this research question consists of two sub-questions:

> *How do researchers use social media, and do they use it to promote their research and co-operate with companies?*

> *How and to what extent do potential customers and business partners use social media to find information on research to support their innovation activities?*

The main research method is a case study of researchers from VTT (vttresearch.com), the leading research and technology development company in the Nordic area. VTT has been increasingly using social media at an organizational level to support and complement other communications activities. VTT management encourages individuals at VTT to be active in social media as experts to promote their research and raise general awareness of the research institute nationally and internationally. VTT's social media policy is that an individual professional profile can be created without notifying any manager or communications department, but if a profile is created for an organizational entity such as a team, the communications department should be notified about it. Brief training sessions are organized occasionally to help people get started and to share good practices.

The research data was gathered through interviews and an online survey. Twelve VTT researchers were interviewed related to their social media use and experiences, and an online survey was created and targeted at potential customers (i.e., people working with the development of new products and services). The details of the data collection are explained in more detail in connection with the results.

Background Research

Mauroner and Fauck (2014) researched the use of social media at the German research institute Fraunhofer

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Society in 2010 and 2014. Their research shows that many research institutes behave conservatively with regard to social media and, although social media use had increased a lot at Fraunhofer between 2010 and 2014, neither the central office nor the institutes monitored it. Their research found that social media strategies are needed to address decision makers in companies and research organizations, politicians, and research sponsors. Social media offers many possibilities for research institutes to spread information and obtain knowledge about the needs of the target group and to adjust its own service portfolio.

Lacoste (2016) interviewed account managers to develop a key customer engagement model. Her major finding was that, for key account managers, virtual social networking typically is the first step toward more personal and face-to-face relationships. It was a type of entrance gate toward customer engagement. The openness and the presence of competitors were experienced as inhibitors to social media use among the interviewed key account managers.

Keinänen and Kuivalainen (2015) explored the behaviour of B2B customers regarding their social media use for business purposes. Their study showed that private social media usage has the most significant relationship with the social media business use; however, social media was not always experienced as useful.

Swani, Brown, and Milne (2014) analyzed more than 7000 tweets by Fortune 500 companies and concluded that marketers in B2B and B2C settings exhibit significant differences in their branding and selling strategies. In an earlier study, Swani and co-authors (2013) investigated the key factors that contribute to Facebook brand content popularity metrics for Fortune 500 companies' brand posts in B2B versus B2C markets. The results of their study indicate that the inclusion of corporate brand names, functional and emotional appeals, and information search cues increase the effectiveness of B2B messages.

Järvinen and colleagues (2012) researched the social media use of 145 B2B firms from different industries. They concluded that, despite the interest in social media, companies tend to focus on one-directional communications with established digital tools. Additionally, their research indicated that the advances in digital data analysis tools remain largely unexploited. The firms also lacked human resources and expertise to exploit the opportunities provided by the developing digital environment.

In a later study, Järvinen and Taiminen (2016) studied organizational processes of B2B content marketing in terms of creating and delivering timely and valuable content, the use of content marketing automation, and marketing and sales alignment. Their key finding was that content in social media needs to be created by taking into consideration the information needs of the customers. The content must give value to the customers, for example by providing advice and helping to solve practical problems. They also emphasize that learning takes time and that the management needs to support this learning process.

Experiences of VTT Researchers in Social Media

Twelve VTT researchers were interviewed about their practices and experiences of professional social media use. The subjects of this study were researchers because their professional competences are central to the topic. Although researchers do not have direct sales responsibility in the organization, in effect, it is their skills and knowledge that is being sold; therefore, researchers play an important role in promoting the organization's research services. The selected interviewees were researchers who had at least 150 followers in Twitter and used social media at least once a week on average. Three of the researchers were female and nine were male; three of them were under 35 years, five were between 35–45 years, and four were over 45 years old. The interview questions were sent to them in advance. Each interview took from 1 to 1.5 hours and was recorded and transcribed.

The themes of the interview were the interviewee's history of social media use, their goals of professional social media use, their ways of using social media, and their experiences of using social media. The questionnaire also included some statements regarding making connections to companies and other researchers, and the benefits of social media use. Each interviewee was asked to indicate how much they agreed or disagreed with the statements from "strongly agree" to "strongly disagree".

The following subsections summarize the results focusing on three main aspects: why and how researchers were using social media; how beneficial they regarded their use of social media; and what kind of challenges they experienced.

Why and how

Many of the interviewees had used social media privately for several years. Twitter was currently the

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most actively used channel for the interviewees, and it had typically been in use from one to four years.

> *"I have used LinkedIn more than 10 years, but it is more like a rolodex as it does not offer as effective a news feed as Twitter."*

Some of the researchers had started to use social media out of social pressure from peers, some out of curiosity, and some because they were involved in projects that required being present in social media.

> *"I was on a business trip and met social media people who made me notice that I was 'out' and I decided to become active in social media."*

All interviewees used social media to find information and stay up-to-date with the latest developments. Some used special tools and services to keep track of developments relating to their professional topics. Several interviewees mentioned learning to use social media and learning new things in general as their motivations.

The interviewees provided content to social media mainly by sharing links to content available in publications and websites; reposting other people's entries; and writing a blog and sharing links to it:

> *"More than half of a project report was based on my blog posts."*

The goal of reposting was to raise awareness of a topic the interviewee found important, and also getting connected to other users as reposting makes other people aware of one's existence and encourages following. Most interviewees wanted to add a comment to reposts and shared links to explain why they found them interesting or important. The frequency of posting depended highly on the person: some interviewees were very critical and ambitious about posting and wanted to post only when they had something important to say, whereas others thought that, it is better to post frequently than to keep silent for too long.

Several people mentioned the intention of building their own brand and increasing their professional visibility.

> *"I see myself as a 'person-brand' – being researcher is an identity."*

Others emphasized promoting VTT's brand and research. This difference could be seen in the type of posted content: brand-builders created and shared their own content whereas the others used VTT-provided content:

> *"I would like to tweet, but give me the content."*

Benefits

The interviewees had benefitted from using social media in different ways:

- Gaining professional visibility and credibility.
- Networking: it is easier to go to talk to people or call them when you are following them on social media.
- Event information: finding out about interesting events and following events if participating was not possible.
- Finding information about project calls, projects, new trends, and ideas.
- Following professionally relevant news anywhere and anytime through mobile.
- Gaining an idea of someone's personality by following their social media activities.

Conferences and seminars were mentioned from several points of view. Events can be followed through Twitter without requiring the user to be present. When participating in seminars, live tweeting provides a good opportunity to connect and gain new followers. Including one's Twitter handle in presentation slides encourages others to follow and keep in contact. Contacting people in seminars is easier after following them on Twitter.

In general, the threshold for sharing information, commenting, and contacting people in social media was considered low. All except one had successfully networked with other researchers in their field. Half of the interviewees felt that social media had helped them become better known within Finland, however, only one quarter felt that they had become better known internationally. The least success had been achieved in the area of company co-operation. Eight out of the twelve interviewees had found out about companies' research needs through social media, but only four had found companies that were interested in participating in research projects and only three had found companies that might be interested in commercializing research results. Overall, nine out of the twelve interviewees had the opinion that social media provided concrete benefits for their work.

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Challenges

The amount of information in social media and the task of following it was considered a challenge, and there is a need to be disciplined in order not to "get sucked in".

> *"You would become crazy if you tried to follow everything."*

The speed and culture of social media pose challenges to researchers. Things evolve very quickly, and if one does not have the chance to comment immediately, the opportunity to participate in the discussion may be lost forever. Writing concise, smart, and interesting posts takes time, at least at the beginning. If using social media is part of the researcher's current project, being regularly active in social media is not a challenge, but without such a project, finding the time can be difficult and may require using one's free time for social media activities. Getting one's messages to spread and having relevant people notice them is not easy; colleagues sharing the message and, in particular, getting the traditional media to run a story help in getting visibility.

The culture of social media allows posting and reposting without knowing much about a topic and allows users to even express opinions quite harshly. As one interviewee put it, there can be "Stupid people, who shout." This is very much the opposite of the research culture. Researchers want to check their facts, and this takes time, which is in conflict with the dynamic nature of social media. The interviewees were also aware about the fact that nothing disappears from Internet, which made them careful. However, some of the interviewees emphasized proactiveness and encouraged action:

> *"It is better to do something and get criticized than do nothing."*

> *"You have to be present to be credible."*

Social Media in Companies

This section summarizes the results of the online survey targeted at people working in the development of new products and services. The survey asked about respondents' professional social media use in general and specifically how they use it in connection to innovation development. There were also some questions about VTT's social media channels for those who followed them. The questions were formulated as statements and the respondents were asked to indicate how much they agreed or disagreed with the statements from "strongly agree" to "strongly disagree".

The survey was advertised in several social media posts and with paid social media advertisements as well as in a VTT newsletter. The survey attracted 14 responses from five countries: Belgium, Finland, Italy, New Zealand, and Romania. Respondents worked in five domains, out of which "professional, scientific, and technical activities" and "information and communication" were the most common ones, with 5 respondents from each of these two domains. The small number of replies precludes statistical analysis, but the survey results do give an indication of the company perspective.

Among the respondents, LinkedIn and Twitter were the most often used social media channels. The reactions to the statements that describe the respondents' social media use habits are summarized in Figure 1. As can be expected, liking is much more common than commenting or discussing professionally relevant content on social media.

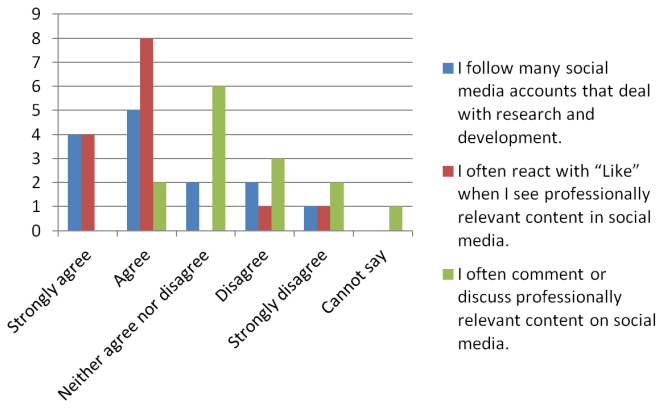

Figure 1. Statements describing the company respondents' habits regarding their social media use

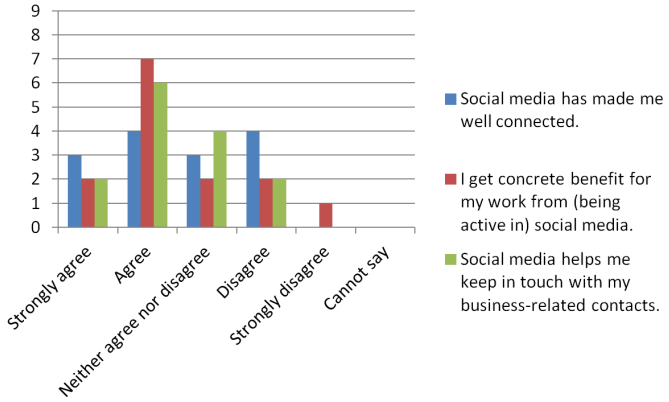

Figure 2. Statements describing benefits received by companies from their social media use

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Figure 2 shows the reactions to the statements about the benefits of the social media use by the surveyed companies. The respondents agreed to large extent with the statements about receiving concrete benefit to their work and about the use of social media as a channel to keep in touch with business contacts. The respondents were a bit more cautious in their reactions to the claim that social media had made them more connected.

The respondents predominantly agreed with the two statements shown in Figure 3 regarding the topic of "social media for innovation development". Social media is a source of information about new technologies and new people and companies for future collaborations. The respondents agreed the least with statements that social media helped them to find new potential customers or to define the timing for introducing new products or services.

Figure 4 shows the respondents' reactions to the statements relating to VTT's presence in social media. Many respondents found social media a good channel for a research institute to make itself more known, and also the presence of individual researchers was found to be important. These findings speak to the importance of being active in social media both at the researcher and research institute levels.

Model of Social Media Use by Researchers

Figure 5 summarizes the findings of social media use by researchers based on the interviews and social media survey. *Finding information* through social media is considered as the most important benefit and it also requires the least effort from the user. *Sharing information* in current social media services is easy as the information can be spread with a couple of clicks. Researchers need to communicate with many types of organizations and people, and social media supports this, even though the contacts to other researchers seemed to be the most common ones. *Lightweight connecting* with interesting people in social media supports establishing real personal contacts, which is another concrete benefit from social media use and can even lead to business cooperation. Building one's *professional reputation* seems to require active content creation and sharing both through social media and traditional media channels. Given that the amount of content in social media is huge and there is lot of competition for getting attention, gaining visibility and strengthening one's reputation requires active participation.

Conclusion

This article summarized research into the role of social media in creating collaborations between researchers of a research institute and product or service developers in companies, and it presented a model of researcher's social media use. The results of this study are based on interviewing individual researchers and conducting an online survey targeted at product or service developers in companies.

From the researchers' point of view, the biggest challenge in social media use is the cultural "conflict" between the research world and social media. Researchers want to be accurate in what they publish and publish only when they have something new and important

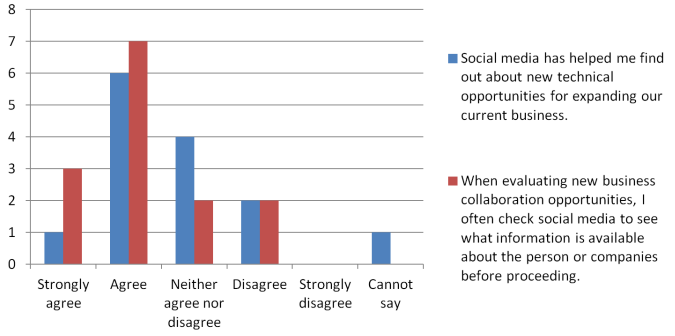

Figure 3. The statements respondents predominantly agreed with regarding "social media for innovation development"

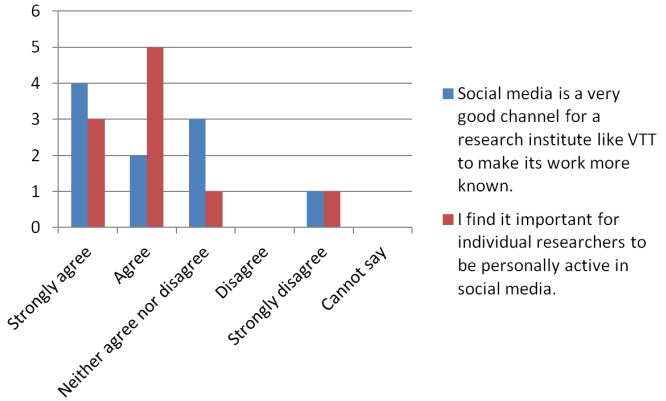

Figure 4. Company respondents' views on VTT's presence in social media

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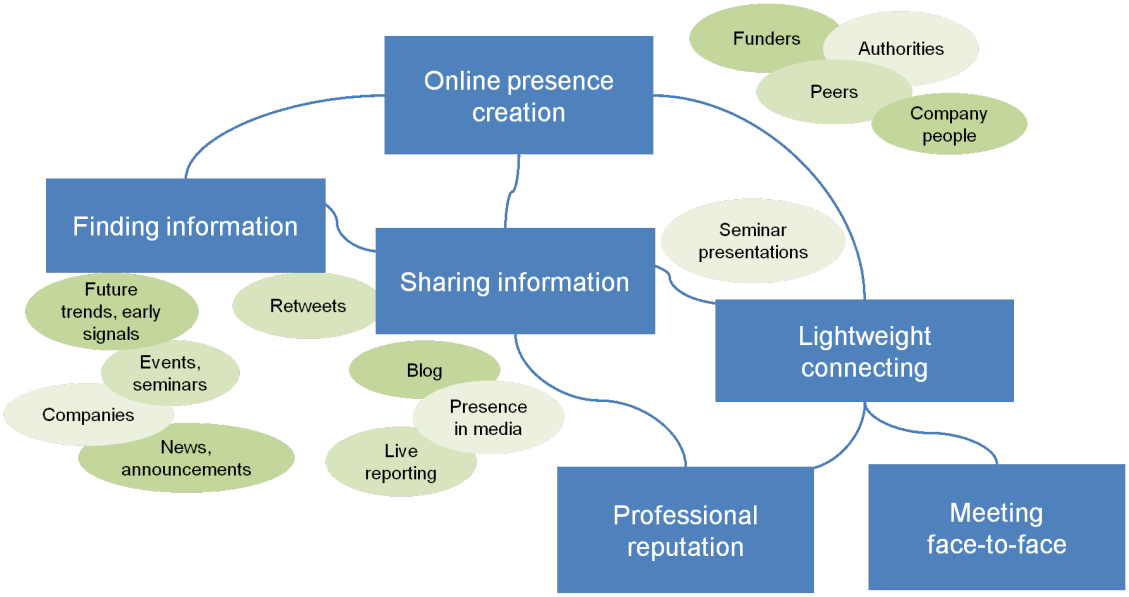

Figure 5. The model of researcher's social media use

to say, and this does not always fit well with the dynamic nature of social media, where frequent presence and quick reactions are needed. Their presence in social media is, however, well-motivated as the surveyed company representatives found it important that both research institutes and individual researchers are personally active in social media. They also considered social media to be a good channel for a research institute to make its work more widely known. Both company representatives and the researchers used social media to keep up with new developments and learn about new things. Research, by its nature, produces new information, thereby giving genuine opportunities for contributing interesting content.

The positive experiences of some of the researchers showed that social media contributes to demonstrating credibility and increasing reputation. The benefits of social media, however, do not come for free, but require active participation, fresh opinions and new, personally created content. The lightweight networking in Twitter helped researchers to make new personal contacts to other researchers and relevant persons from industry and media. Presence in traditional media boosts social media following and vice versa; social media is not to be seen as an isolated area, but in continuous interaction with other ways of communicating and publishing.

Managers and team leaders who want their researchers to use social media to promote their work must accept that building networks and acquiring reputation in social media needs continuous work and time. Synergistic benefits can be gained by combining social media with other activities such as seminar presentations, news stories, and publications. Personal interest in being active in social media is needed for successful social media presence, and therefore those team members who are interested in social media should be encouraged to use it as they can act as bridges and examples. By monitoring results from social media use, templates and models of successful ways of social media use can be gathered and efficiency can be improved.

Finally, the limitations of the current study point to possible avenues for future research. The results cannot be generalized as the numbers of survey respondents and interviewees were small, and all the interviewees worked in the same organization. In future studies, the interviews could be extended to other countries and research organizations to find out about differences and similarities. The online survey could be marketed more extensively to receive a wider response, or it could be targeted to a more specific sector. Also, company representatives could be interviewed to obtain more insights than possible with a survey. In the spirit of this article, we hope to promote the current study through social media to share our results and build networks facilitating future work in this area.

How Researchers Use Social Media to Promote their Research and Network with Industry

Päivi Jaring and Asta Bäck

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Q&A

Clovia Hamilton

Q. Does Machiavelli's The Prince *Have Relevant Lessons for Modern High-Tech Managers and Leaders?*

A. When we think of Machiavellian conduct in technology companies, we think of cut-throat, cunning, behaviour. Cut-throat competition in technological innovations can be the barrier to market entry (Lee, 2014). The lean philosophy is that managers and leaders are to strive for the efficient and effective use of resources in order to overcome this barrier and gain competitive advantage. In order for there to be cut throats, there have to be cut-throat technology innovation leaders and managers. What the lean philosophy lacks is guidance on how to achieve an efficient and effective use of resources in a cut-throat competitive environment. The challenges posed by that type of environment do not go away and cannot be swept under the rug.

But can a 16th-century political treatise provide any guidance on today's competitive environment? There are two camps among scholars regarding the relevancy of Niccolò Machiavelli's book *The Prince* (Machiavelli, 1992) to modern day management and leadership. Some scholars argue that the book has never been or is no longer relevant to business management and leadership (Agbude, 2014; Fournel, 2014; Jackson, 2013; Tillyris, 2015). Some contend that it is indeed relevant (Konno, 2014; O'Sullivan, 2014; Rojek, 2014; Ruggiero, 2015; Soll, 2014; Thomas, 2014). Herein, it is argued that this work by Machiavelli is indeed relevant. In particular, it is widely accepted that leaders and managers are more effective if they have influence. However, Machiavelli has been wrongly associated primarily with the advocacy of vile tactics of manipulation. It is argued herein that *The Prince* has an over-arching emphasis on the importance of a leader's or manager's acquisition and sustenance of influence. A number of modern day examples of how Machiavellian lessons are and can be applied today in the high-tech arena follows.

Modern Day Applications of Machiavellian Lessons

It has been taught that *The Prince* attempts to separate power from ethics, and that having good character is not sufficient for leadership (Levine, 2014). This type of leader is only interested in being effective, and ethical goodness and effectiveness are not likely to go hand in hand. Individuals that take this view of *The Prince* may not think the book is relevant to modern day leaders that are under considerable pressure to engage in corporate social responsibility and ethical behaviour. Yet, morality and achieving business results are interconnected. Character is the combination of a person's moral habits and internalized beliefs that shape his or her relationship to others (Kiel, 2015). Today, character-based business results have been coined "return on character" (ROC) and have been studied. The ROC has been identified as an element of a CEO's formula for creating value (i.e., processes, products, raw materials in its value chain). Along with ROC, other elements in this formula for success include life experiences, character habits and beliefs, decision-making skills, readiness, and genetic dispositions (Kiel, 2015).

In addition, a few researchers have argued that "Machiavelli writes from the present, about the present, and for the present" (Fournel, 2014). Thus, *The Prince* would have been written for a Renaissance era audience and would not have been written by Machiavelli with the intention of being relevant to our modern day leaders or managers. Taking this position is in alignment with the belief that the building of character involves internalizing the moral principles of one's society (Wilson, 1998). Thus, Machiavelli's character would reflect the moral principles of the Renaissance era. However, others take the stance that there are universal moral principles that people internalize such as integrity, responsibility, compassion, and forgiveness (Kiel, 2015). Such universal moral principles would not be limited to any one society or time period.

There are sages that have argued that *The Prince* was written for politicians that struggle with "a dirty hand problem", and that politicians are worse than others (Tillyris, 2015). Thus, through this lens, *The Prince* would not be relevant to modern day leaders and managers who are not politicians. The dirty hand problem relates to the idea that "in certain tragic circumstances, politicians may be required from a normative and prudential perspective to do or tolerate things that are

Q&A. Does Machiavelli's The Prince Have Relevant Lessons for Modern High-Tech Managers and Leaders? *Clovia Hamilton*

immoral" (Tillyris, 2015). Proponents of this viewpoint argue that other leaders and managers would not face such circumstances and would not have to tolerate any of the immoral acts that Machiavelli espoused in *The Prince*. For example, these proponents of *The Prince's* irrelevance to leaders and managers embrace how Machiavelli may not favour any innocent aspirations in politics given that such innocence would neglect the realities of power. Innocence would be antithetical to the political experience (Tillyris, 2015).

Tech Business is Political

Some scholars have simply argued that Renaissance Florence is not our modern world and that the political world espoused in The Prince is not the business world today (Jackson, 2013). Other researchers contend that Machiavelli's teaching that political leaders are to act as beasts seems to be a dangerous proposition for the corporate world to enact (Agbude, 2014). This literal interpretation argues that beheadings would not be allowed today and that politics is cutthroat, unlike business (Jackson, 2013). Yet, to think that business is not as cutthroat as politics is simply naïve. Business can easily be more political and more cut-throat than politics.

Scholars that argue that Machiavelli's book *The Prince* is still relevant note that he observed power first hand and how it really works. These timeless power dealings and the notion that ambition can lead to corruption still exist today (Harris, 2010). Machiavelli is a realist who teaches the harsh truth about leading and managing people from a position of power. More importantly, he teaches what leaders need to do in order to hold ground and sustain their power positions with the exercise of good governance (Zuckert, 2014). For example, Machiavelli teaches leaders to: i) appreciate goings on – don't avoid it, hide from it, or say you are not political; ii) recognize that lobbying is important; and iii) scan the organizational system to assess issues and train staff to cope with change (Harris, 2010).

Heated Legal Disputes

Some savants have pointed out the irony in *The Prince* and how what Machiavelli condones seems unjust but are his reasons or rationale for justice (Quaglioni, 2014). The word justice never appears in *The Prince* and some scholars believe that Machiavelli evaluated politics as a power independent of law. However, Machiavelli does indeed mention laws and taxation throughout *The Prince,* and he teaches that there are two ways of fighting: by law or by force (Agbude, 2014). Reasoning about justice is central to Machiavelli's ethics and political thought, and his "thought is applicable to all times" (Quaglioni, 2014). Although this application to ethics, laws, and justice is not directly intended for leaders and managers, it is indirectly relevant. And it is relevant today because today's business leaders and managers fight by going to court and battling out disputes. An example is how Larry Ellison, CEO of Oracle, publicly attacked Hewlett Packard (HP). HP then sued Oracle about trade secrets when Ellison hired Mark Hurd away from HP (Mendleson, 2011).

In a review of Erica Benner's 2014 book entitled Machiavelli's "Prince": A New Reading, it was noted that, in *The Prince,* there are powerful, reasoned undercurrents of substantial ethical thought, which "nowadays passes for conventional morality" (Connell, 2015). This is ironic. An example is how Machiavelli actually did not praise or tolerate vicious rulers, but rather urged that they be good, pious, and merciful princes (Konno, 2014; Machiavelli, 1992):

> *"To slaughter fellow-citizens, to betray friends, to be devoud of honour, pity and religion, cannot be counted as merits, for these are means which may lead to power, but which confer no glory."*
> (Machiavelli, 1992)

An example of a hypocritical leader is Microsoft's Bill Gates. Although he spoke openly as an advocate for entrepreneurial innovation, he worked ruthlessly to gain an anti-competitive monopoly control over his industry sector and the government went after Microsoft in an antitrust dispute (Kapor, 1998). The US Department of Justice (DOJ) and Federal Trade Commission (FTC) investigated Microsoft in the early 1990s and required Microsoft to sell its Internet Explorer software separately from the Windows operating system. A 1995 consent decree served to stop Microsoft from creating operating system market entry barriers with its intellectual property licensing practices. A 1997 case against Microsoft by the DOJ accused them of violating the consent decree continuing to tie Internet Explorer to Windows, and Microsoft won in 1998 (Burtis, 2001).

Bullies, Hostile Takeovers, and Injurious M&As

Hypocritical leadership is detrimental to a leaders' relationship with their employees because employees want to be able to trust their leader. Employees pay close attention to what leaders value and the behaviours that the leader rewards, promotions, who gets to work on

Q&A. Does Machiavelli's The Prince Have Relevant Lessons for Modern High-Tech Managers and Leaders? *Clovia Hamilton*

the best projects, causes that get support, who gains influence with the leader's support (Markman, 2016). Thus, although a few scholars interpret *The Prince* as not teaching leaders to exercise virtuous character, other scholars disagree and would argue that it teaches that, in order to be effective, leaders need to be people with virtuous character (Konno, 2014). *The Prince* is still relevant from the perspective that the methods espoused therein are to be used for political effectiveness. The use of prudence and virtue is not merely for moral, ethical action, but to gain effectiveness (Soll, 2014). It is not uncommon for modern day leaders and managers to strive to be both efficient and effective in their human interactions (Yukl, 1999). In an attempt to be more effective, some modern leaders use cruelty to instill fear in their employees. In the 1950s and 1960s, fear tactics dominated until the shift from industrial to more information-based economies (Snook, 2008).

The irony is that this virtue may manifest itself as being just as ruthless as the technology industry's Steve Jobs, Meg Whitman, and Larry Ellison are depicted (Konno, 2014). Meg Whitman is notorious for cutting a total of 85,000 jobs as part of a turn-around strategy to save the HP brand (Darrow, 2016; Tobak, 2015). Apple's Steve Jobs was reportedly controlling and ruthless, had strained relationships with employees, instilled fear and control over employees, was obsessively secretive, ruled with an iron fist, and pushed products out before they were ready (Gibbs, 2014; Mendleson, 2011; Tate, 2011). Larry Ellison, the CEO of Oracle, is also notorious for cut-throat tactics such as ridiculing the competition and hiring a private investigator to snoop through Microsoft's garbage (Mendleson, 2011). Like Steve Jobs, Larry Ellison misrepresented facts and told customers that a product was available when it was just a thought and not in the design phase yet (Pfeffer, 2014). In the early 1990s, Ellison also misrepresented Oracle's actual sales numbers in financial filings. In addition, he is known for his ruthless, aggressive hostile take-over manoeuvres (Nisen, 2012). Oracle made two hostile takeover bids for Peoplesoft and the US Department of Justice had to step in to address antitrust concerns resulting in the 2004 merger of the two companies (Weinberger, 2016).

A lesser known Machiavellian-type CEO is Mark Pincus of the computer games company Zynga. Pincus reportedly obsessively tracks analytics for all staff, sets harsh deadlines, and aggressively pushes his employees to meet them (Nisen, 2012). There is also former Microsoft CEO Steve Ballmer who is known for his temper. Given that Microsoft has lost to Google and Apple in the iOS and Android tech spaces, when the former Microsoft employee Mark Lucovsky announced he was leaving Microsoft for Google, Ballmer threatened to "kill Google" and hurled a chair across a room (Enderle, 2014; Nisen, 2012). There is irony because Machiavelli teaches on the one hand that leaders that act in the name of virtue will be destroyed, but encourages princes to use vice if to gain security and prosperity (Ruggiero, 2015). Machiavelli taught to only be harsh if necessary (Kessler, 2010). This is exactly how some modern leaders operate and therefore, *The Prince* is indeed relevant to modern day leadership.

Some scholars have taken the viewpoint that any reference to the cruelty indicative of the Renaissance era in which Machiavelli lived simply does not apply in a modern western democracy. Yet, the lessons about human interaction remain relevant and enduring (Corrow, 2014). Further, it would be quite easy to view references to cruelty in *The Prince* metaphorically today. For example, references to the viciousness of war and combat are commonly compared to cut-throat business competition today (Galie, 2006). For example, automaker Volkswagen's CEO Martin Winterkorn fostered a corporate culture that was cut-throat and insular (Dishman, 2015). Winterhorn reportedly called employees out with public criticism and pressed employees for perfectionism. This is believed to have led to the faulty reporting of vehicle emissions (Fortune, 2016). An example of one of the largest high-tech hostile takeovers was integrated circuit designer Daisy Systems of Mountain View's offer to buy 11.7 million shares of Cadnetix, the creator of equipment for designing circuit boards that hold the chips (Frantz, 1988). This was a $94 million deal. Daisy Systems then went by the name Dazix, suffered financial losses and filed for Chapter 11 bankruptcy. Then Integraph bought it for only $14 million (Frantz, 1988).

CEO cut-throat behaviour occurs in the biotechnology sector as well. In 2014, after peaceful negotiation attempts, Pfizer proposed to acquire AstraZeneca with an unsolicited $119 billion bid, and Valeant Pharmaceuticals waged a $53 billion hostile take-over Allergan (Gelles, 2014). Valeant's CEO Michael Pearson misstated financial results and was applauded for marking up drug prices and vilified for it as well because of shady tactics used to get customers to buy such drugs in the Philidor mail-order business (Fortune, 2016). In addition, the former CEO of Turing Pharmaceuticals Martin Shkreli was indicted for his business strategy of buying cheap drugs and selling them at outrageously marked-up prices (Dishman, 2015; Fortune, 2016).

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Besides hostile take-overs, there are also high-tech mergers that result in ruthlessly depressed share prices and layoffs. In 2015, Dell bought EMC for $67 billion and Microsoft bought Linkedin for $26 billion (Weinberger, 2016). The Dell/EMC merger is now expected to result in 28,000–35,000 layoffs, although the original expectation was 2,000 (Mellor, 2017). The AOL/Time Warner merger resulted in 2,000–2,500 layoffs (Schiesel, 2001) but ultimately did not work out, and AOL was spun back out in 2009. When HP merged with Compaq in 2002, it resulted in 30,000 HP employees being laid off. Later, HP merged with EDS in 2008, which has resulted in a number of layoffs from 2008 through 2016 (Darrow, 2016; Weinberger, 2016). Machiavelli taught that leaders must follow up after conquests by figuring out how to deal with the lack of support that will follow if the leader gets rid of individuals that might cause them trouble (Machiavelli, 1992). Although, with mergers, the decision to lay off thousands of workers is a business decision to avoid financial trouble, the layoffs create enemies and bad press. Thus, per Machiavelli, leaders have to figure out how to deal with this diminished support.

Infliction of Cruelty – Balance and Blows

Machiavelli's teachings provide an "appropriate picture of recent and societal and commercial leaders" (Thomas, 2014). According to the lessons in *The Prince,* the use of cruelty and fear are more effective than compassion (Thomas, 2014). This is the harsh reality of how many modern day leaders operate from the standpoint of attempting to be more effective in their leadership roles. Although harsh and ruthless and truly the way of the world, Machiavelli teaches balance. Some modern leaders strive for balance. They may start out with an urgent entrepreneurial spirit to drive hard and become powerful, and then over time mellow out like former Microsoft CEO Bill Gates and Michael Dell of Dell computers (Tobak, 2014).

When subordinates do not get their way or experience perceived or real deprivation, they label the leader cruel. Machiavelli teaches that a leader should inflict cruelty all at once and not persistently in a well-employed manner if necessary for self-preservation and later modify it to the advantage of the governed subordinates (Machiavelli, 1992). Modern day examples of such poor execution of cruelty include HP's CEO Meg Whitman's serial layoffs rather than one large cut in staff at once (Darrow, 2016). Yahoo's CEO Marissa Mayer is also notorious for series of layoffs (James, 2016). Machiavelli teaches that ill employed cruelty is cruelty that advances over time from small beginnings and increases rather than diminishes. He also taught that a leader or manager that seizes possessions (in this case jobs) will have enemies in all of the individuals injured. Further, Machiavelli also espoused that the leader or manager would not be able to keep the friendship of those who helped them gain the position seized because the leader or manager cannot reward them as they might expect or injure these helpers (Machiavelli, 1992). This occurs when there are layoffs. The individuals who may have originally been helpers and helped these new CEOs get their positions of power, may lose their jobs.

Securing Goodwill and Social Influence

Banker Mervyn King, formerly with the Bank of England, agrees that *The Prince* offers lessons for today's rulers. Having served under three British prime ministers, King argues that Machiavelli's teachings, especially the lesson about securing the goodwill of one's inhabitants, is still very relevant today (Hamilton, 2014). Machiavelli's influence is evident in his name being used in common parlance today in the spillover of his writings into business management (O'Sullivan, 2014). With respect to securing goodwill in order to keep key personnel from leaving, CEO Marissa Mayer gave them sizable retention bonuses. However, this attempt to secure the goodwill of key employees backfired because the other employees resented it (James, 2016).

The resentment and making of enemies were also espoused by Machiavelli. He taught that, when making changes, seizers of possessions would have enemies among all who were well off under the existing order (Machiavelli, 1992). In addition, Machiavelli espoused that leaders who take over by seizure need to make themselves respected and obeyed (Machiavelli, 1992). Respect and obedience are earned. Where there are resentment and enemies, respect and obedience are likely difficult to come by. Thus, Machiavelli also taught that since subordinates may lose their patience and loyalty, the leader should always hold out hopes to subordinates that any enemy cruelty in retaliation will be short lived and any complainers will be silenced (Machiavelli, 1992). Further, he taught that the leader needs to make sure that subordinates are well fortified, supplied, and armed (e.g., in business, it would be with

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knowledge, skills, abilities, financial resources, office space, comfort, equipment, hardware, software, and the like), for it is difficult to be attacked by enemies if the enemies' domain is well fortified (Machiavelli, 1992). This diminishes subordinate animosity toward the leader. Yet, this is a balancing act, because Machiavelli advocates that benefits should be conferred to subordinates little by little so that they are more fully relished by the subordinates (Machiavelli, 1992).

Further, modern day leaders and managers strive for influence. Influence is a buzzword in modern business management and leadership. Many strive to gain influence through social media marketing and networking. Examples include: i) former Sun's CEO Jonathan Schwartz with his use of open debates via Internet blogging; ii) Toyota's CEO Jim Lentz using social media to openly address questions regarding Toyota's recall of 2.3 million vehicles for faulty brakes; and iii) IBM's support for its employees' technology blogs (Stansberry, 2010). The idea is that the larger a leader's or manager's following, then perhaps the greater their influence on others. Thus, the notion of influence is related to Machiavelli's teachings about how to hold ground and sustain a power position once it is acquired. Influence can help leaders and managers sustain their power positions. Modern day scholarship about gaining celebrity status has recognized *The Prince* as providing expertise in managing fame and self-promotion in today's celebrity culture (Rojek, 2014). His prince-like figures wielded an incredible amount of representational influence and fame. The princes were to display symbolically the public appearance of goodwill, and per Machiavelli, this was to be genuine goodwill. However, Machiavelli has been characterized as being manipulative and teaching manipulation. A real-world example of too much self-promotion at the expense of the company is Yahoo's CEO Marissa Mayer's alleged concern with her own brand image rather than Yahoo's (James, 2016).

Both influence and manipulation produce an effect in another person without force (James, 2013). To manipulate is to have control over others' behaviour and actions by influence – by artful, unfair, insidious means, by playing to fear, and for self-interest (James, 2013). Influence is more positive than manipulation because it emanates from moral, spiritual roots – via charisma, admiration, considering the needs of others (James, 2013). Without virtue or prudence, cunning and malice lead to manipulation (Soll, 2014). Thus, influence needs virtue and prudence. This is advocated by Machiavelli in *The Prince*.

Additional Machiavellian Lessons

Niccollò Machiavelli also taught that a leader or manager who seizes possessions must remove old familial lineages of leadership (Machiavelli, 1992). This may occur when a family-owned startup company is purchased by another company. The original family of leaders may have to step down from their positions of control. Machiavelli also taught that, when a seizure of possessions is being executed, the leader should send in support colonies of individuals as keys of the organization in order to deprive a small part of the community of possessions and leave the scattered remaining individuals quiet and afraid to make a false move lest they will share the same fate of deprivation (Machiavelli, 1992). In addition, he taught that seizers should lay foundations before acquiring possession of a built organization or do so later at great inconvenience, risk to the builder, and risk to the building. The foundation is laid by knowing the individuals who must be conciliated or crushed (Machiavelli, 1992). An example of this is layoffs. However, under Machiavelli's strategy, Meg Whitman and Marissa Mayer would have had a different leader begin the process of layoffs before Whitman and Mayer became CEOs. In fact, this actually did occur at HP. Prior to Whitman, Mark Hurd cut 15,200 jobs in 2005 (Tobak, 2015).

In *The Prince,* Machiavelli stated that the seizer should make themselves the head and protector of feebler neighbourhoods and endeavour to weaken the strong and not let anyone as powerful as themselves enter the organization (Machiavelli, 1992). An example of this in the modern day high-tech arena would be a company leader or manager who does not give their stronger employees authority or resources, or who chooses not to hire anyone who is stronger than themselves with respect to knowledge, skills, abilities, and clout.

Machiavelli also taught that a seizer should find discontented individuals who are desirous of change who will be able to open the way for their conquest (Machiavelli, 1992). This occurred at HP when the Board of Directors supported Meg Whitman, an HP board member, on becoming CEO (Yang, 2011). Another related lesson is that Machiavelli taught that seizers need to study whether the changes they want to implement can stand alone; have to be implemented by force; or depend on the aid

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of others and have to be carried out with resort to entreaty (Machiavelli, 1992). In Meg Whitman's case, she received the aid of the Board of Directors. Machiavelli also taught that, when nobles help a leader get into office against the will of its inhabitants, that leader must conciliate them by taking them under her protection and treat them well. That leader should also always be on good terms with the people that help them seize the organization (Machiavelli, 1992).

Further, Machiavelli taught in *The Prince* that those who gain their positions by good fortune with little exertion will need to expend considerable exertion to maintain their position. They have to answer to stakeholders and to be true to their own expectations. Therefore, these leaders are subjected to iterative qualifying, self-imposed, circumstantial, and political assessments and challenges in order to maintain their positions of power and authority over followers (Lansberg, 2007). In the high-tech arena, these tests would shape the stakeholder expectations of leaders.

Conclusion

We need to learn from flawed leaders because many corporate leaders have malicious or corrupt tendencies. Also, when leaders are coercive to maintain power and order, it is viewed as bad leadership because there is a yearning for feel-good stories (Kellerman, 2004). When examining the high-technology business leader examples put forth in this response, it is important to note that these leaders' characters shape their workplace behaviour and business decisions. The examples are not sufficient to inform whether these leaders have the elements of the ROC magic formula for creating value. Some leaders want to create value plain and simple. They may honestly believe that their decisions are the right choices. Some of the leaders in the examples may be bad actors that are overly ambitious, greedy, and seek to gain at others' detriment. Many do both by seeking to do right and create value, and act badly in the process. All people display both vile and kind motives and choices (Kiel, 2015; Wilson, 1998). Thus, the nature of character is as complex and varied as the real world. Having strong character requires finding balance so that the leaders' behaviour promotes the most good (Kiel, 2015). To this end, a leader can be a complex person who is stern, insulting, and also inspiring and caring (Snook, 2008). Machiavelli teaches leaders and managers to manage the expectations of others and to manage the organizational system as a whole community at all times rather than piecemeal and only during crises. He teaches leaders and managers to strive for balance and to weigh the consequences of their actions in a strategic, tactical manner as if they are always in a military warfare stance whether in peacetime or otherwise. His teachings are timeless, and every student of leadership and management can benefit from knowing these lessons, because the reality is that there are individuals and circumstances in the business world that are harsh and ruthless. Leaders and managers need to be prepared to deal with this in an effective and efficient manner.

About the Author

Clovia Hamilton is a registered patent attorney with university and federal lab technology innovation and commercialization experience. In August 2016, she earned a PhD in Industrial & Systems Engineering from the University of Tennessee Knoxville in the United States. Clovia also has an MBA from Wesleyan College, JD from Atlanta's John Marshall law school and a Master of Laws (LLM) degree in intellectual property law from the University of Illinois at Urbana Champaign. She researches business law and ethics, technology management, academic entrepreneurship, university–industry partnerships, university and federal lab technology transfer operations as supply chain networks, intellectual property, and scientific misconduct. Clovia served as the Director of Intellectual Property and Research Compliance at Old Dominion University and as a technology transfer specialist for the EPA's National Vehicle and Fuel Emissions Lab and the University of Illinois Urbana Champaign. She has also taught business law and ethics as an Adjunct Professor.

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