PART C: CONCLUSION
1. Discussion
Against the background of the university’s changing role in the scientific system and its task of producing scientific knowledge (Gibbons et al., 1994; Etzkowitz and Leydesdorff, 2000) the presented chapters provide in-depth insights into the underlying individual, interpersonal and organizational factors that need to be considered for setting up strategic measures for institutionalizing UILs at universities. With reference to the process and outcome component of the definition16 of institutionalization, it was observed that for UILs to be institutionalized at universities, these three factors are key elements not only in supporting the performance and repetition of UIL activities, but also in the formulation of mechanisms aimed at shaping current and future UIL behavior. Thus, the following discussion is aligned around three distinct factors – namely the individual, interpersonal relationships and the organization, all put into context with the aspect of experience. The findings for each level are found in the corresponding chapter, demonstrated in the table below:

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Number of Chapter</th>
</tr>
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<tbody>
<tr>
<td>Individual Level</td>
<td>1, 4</td>
</tr>
<tr>
<td>Interpersonal Level</td>
<td>2, 3, 4</td>
</tr>
<tr>
<td>Organizational Level</td>
<td>1, 5</td>
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</tbody>
</table>

Table 13: Link between chapters

**Individual Level**
In the pursuit of fostering UIL activities, university management needs to be aware of the fact that it is individuals, champions (Santoro and Chakrabarti, 2002), who drive UILs. As such, paying special attention to these individuals and benefitting from their experience in UILs certainly aids the institutionalization of UILs. Chapter 1 elaborates on literature explaining the effect experience, which has been gained through having worked in industry before or having conducted numerous UIL activities, has on the individual level. Adding to these insights related to the individual level is chapter 4. Here, specific behavioral changes, caused by extensive experience in participating in UILs, are demonstrated. Individuals undertake changes on three levels – namely the strategic level, mindset level and operationalization of strategies level - to avoid an unsuccessful or disappointing linkage with an industry partner. Whereas an increased strategic behavior and widened mindset is displayed for both parties (academics and industry representatives), the operationalization of strategies is only experienced by academics. An engagement based on strategy, a more defined selectivity in the partner/project selection and a higher level of orientation towards the other environment are facets of a different strategy employed with increased experience in UILs. The different mindset refers to more confidence an individual gains as well as a better understanding of the opposite environment and work attitude. The operationalization of strategies occurs through a more precise management of expectations in the project, quality of research results and resources necessary for conducting the collaborative work. It is important to acknowledge this fact and consider it when determining the compilation of individuals to work on a UIL project. As experience is stored within each individual, it is advisable to let novices work alongside experienced academic researchers to offer them the opportunity to observe and learn. Considering the findings of chapter 4, experience can be regarded as an indicator to explain individual behavior in UILs. While existing literature focused on individual

16 Institutionalization is regarded as both a process and an outcome, where the former “represents the manner of attaining an order that, in turn, reproduces itself” (Colyvas, 2007, p. 458) and the latter “represents the state of having realized this order, and is then reinforced through feedback mechanisms that shape and govern behavior” (Colyvas, 2007, p. 458).
academic behavior in UILs with advanced experience levels, this chapter extends the findings by providing perspectives of both the academic and industry partner involved in the linkage. The findings are of particular value, to as insights about the industry partner are gained as well. Despite the prevailing discussion about differences in culture, the approach in solving problems and communication among academics and industry partners, it is interesting to note changes in both parties, endeavoring to make UILs work.

Interpersonal Level
Not only do individual characteristics guide and affect UILs but also the interpersonal relationship between champions. The relationship between UIL participants presents another factor for determining UIL outcomes. Chapter 2 and 3 outline that UILs as any kind of partnership, are characterized by different stages and the corresponding interlinked success factors. Distinguishing UILs into 5 phases – namely the development phase (leading to an agreement to work together), phase 1 (leading to a contract), phase 2 (leading to the delivery of a project), phase 3 (leading to an on-going partnership and word-of-mouth) and the dissolution/latent phase (potential future cooperation should a suitable project arise) aids in gaining a deeper understanding of the topic. Success factors (communication, trust, understanding, individuals, and delivery), already identified by Plewa (2009) and Rampersad et al. (2010a), can be observed to be present throughout phases 1-3, however at different intensity levels. Therefore, not only must the stage of the relationship be considered but also the differing success factors and their extents. The success of UILs can better be managed through the incorporation and consideration of these success factors. This is not only true for one specific project but also for potential future collaboration with the same partner. Understanding the interrelationship of the success factors in different stages of UILs, permits individuals involved in the linkages to determine and alter the direction of the linkage. Thus, individuals interacting with each other need to be aware of these success factors to achieve the most effective collaboration. Chapter 3 identifies that throughout all three stages the success factor individual has a great positive effect on trust, understanding as well as communication, and leads to a better project outcome. Communication is also found to be positively associated with understanding and UIL outcomes in all three phases, thereby agreeing to Thune (2011). Further, the more trust in the person of the opposite environment and the relationship itself is present in the engagement phase, the more communication takes place. This makes sense, as during the project work, communication is an essential tool to made headway. The greater the level of trust that is established, the more people will be willing to share verbally. Through communicating with each other the understanding for the opposite side, their intentions, performances and deliveries can be effectively discussed and elucidated, which eventually contributes in attaining overall project success (Thune, 2011; Mora-Valentin et al., 2004). Once the project work is over and the relationship enters the continuing engagement phase, trust in the other person and his/her work, and in the relationship in general, creates positive word-of-mouth propagation, which is beneficial not only for one self but may also lead to additional project partners. This finding adds to the results identified by Faems et al. (2008) who state that trust is an essential component in shaping the nature and future of an alliance. Individuals engaged in UIL activities, policy makers and/or transfer agencies at universities should acknowledge the fact and offer trainings/seminars/workshops addressing the importance of interpersonal relationships. The success factors are not only relevant during the actual project work but also create value beyond the project lifetime. Conducting a project with a partner in a comfortable working atmosphere has greater potential of being continued in future. In this respect, the aspect of individuals having experience in UILs is of importance. Experienced individuals can
better make sense of potentially critical situations (Jiang et al., 2008) and adjust better to interpersonal success factors. This also calls for setting up project teams with a mixture of experienced and inexperienced team members. It is of value to set up project teams in that way, as trust established through previous relationships among individuals of two parties can be transferred to the inexperienced “next generation” and thereby ensure a continuous trusting relationship. The same applies for the interpersonal success factor of understanding. Thus, institutionalizing UILs must not neglect the value interpersonal relationships hold. With advancing experience levels, individuals become more aware of the interrelationship of the success factors and their effect on each other. It becomes evident to regard individual changes in behavior closely with the success factors of UILs. Individuals learn from each UIL activity and can thereby adapt their behavior, as outlined in chapter 4.

Organizational Level
For establishing an environment in which UILs can be conducted and enhanced, university management needs to develop appropriate supporting mechanisms and specific instruments (Plewa et al., 2006; Etzkowitz, 2001, Henrekson and Rosenberg, 2001). As can be seen from the MUAS case (chapter 5), this can be achieved by establishing several instruments relating to the supporting mechanisms of policy formulation and development, execution of policies, incentives and communication. More specifically, a university development plan can significantly strengthen UIL activities, even more so if it is continuously monitored with an Academic Scorecard. Thereby, the mission of a university is not only theoretical but is put into practice, made visible and measurable. Formulating specific incentives to encourage the academic researchers’ participation in UILs has proven successful. Incentives can cover a wide scope and can relate to monetary, resource and status aspects (Siegel et al., 2003; Göktepe-Hulten and Mahagaonkar, 2009), as realized by MUAS through a space-allocation scheme, reduction of teaching load and remuneration based on UIL activities. It has to be noted that a mere setting up of measures does not suffice for academics to participate in UILs. The alignment of the organizational with the individual level must be present throughout each measure undertaken (Ponomariov, 2008). A clear communication and continuous demonstration of how the developed measures reach the actual individual is of crucial importance. Enticing academics who have been working at the university for a long time and who were never very active in conducting UILs appears to be difficult in particular. Introducing newly appointed and young academics to UIL activities presents an opportunity for a university to drive UILs among these academics. Therefore, it is important to especially target the young and motivated academic researchers to eventually establish a culture in which UILs are common. Future academics may adapt to the behavior of their colleagues and thereby promote and secure UIL activities at a university. The aspect of experience, either in conducting UILs in general or having worked in industry, plays a significant role in this respect. This not only applies to the individual level, but also to the organizational level. Chapter 1 provides direction, by discussing the effect experience has on the organizational level, predominately based on strategic management and organizational management literature. Using the insights from chapter 1, allows for a transfer of the effect experience has on UILs, being a type of alliance. Experience on the organizational level is stored through rules, functions and units. MUAS exhibits this by establishing a Triangle of Innovation, where each of the three entities (university management, Science Marketing, Transfer Agency) serves a specific purpose in advancing and facilitating UIL activities at the institution. While each of the entities follows its own approach of connecting its organizational and individual level with each other, they cross-fertilize one another so as to attain the maximum benefit. In this case, the key to being such a successful
University of Applied Sciences in respect to generating third-party money, is the continuous
development and implementation of the Triangle of Innovation as well as the gained experience,
which leads to the creation of learning effects and the establishment of routines generated through a
long history of UILs by the institution. Chapter 5 shows that it is necessary to provide the structures,
so that both levels can learn from each other. The experience of the university also depends on the
individuals with that experience. Therefore, it is also necessary to transfer and share the knowledge
within an institution, so as to advance in the institutionalization of UILs. Again, the close connection
between the organizational and individual level is of vital importance, which can be achieved through
instruments such as Open Space events. It has to be noted that Universities of Applied Sciences
benefit from having to employ academics with previous industry experience, as compared to
traditional universities. The experience of these academics proves to be especially helpful, as they
can better relate to the issues and the working environment of industry partners.

Considering the essentials from each chapter, the formulation of a comprehensive theory for
institutionalizing UILs at universities becomes necessary. Having explained the significant effect
experience has on the individual, interpersonal and organizational level and having demonstrated
how the levels can benefit and learn from each other through constant exchange and proper
alignment, UIL literature can be extended. A theory for institutionalizing UILs at universities needs to
consider these findings. Resulting from the discussion above a theory could tentatively be formulated
as: For institutionalizing UILs at universities, it is necessary to consider the experience, on both the
organizational and individual level, as well as the interpersonal relationships between champions of
UILs. This is to be attained through continuous exchange of both levels and the provision of
supporting mechanisms that are operationalized through specific instruments.

2. Conclusion

The purpose of this dissertation was to answer the following 5 research questions, all seeking to
answer the overarching research aim of gaining insight, in order to understand individual,
interpersonal and organizational components for institutionalizing UILs in universities, under
consideration of experience:

1. Reviewing relevant literature
   1.1. What kind of effect does prior experience have on an organizational (institution) and
        individual (academic researcher) level?
2. Analyzing the development of UILs and their success factors
   2.1. What are success factors in university-industry linkages in different stages of university-
        industry linkages?
   2.2. Do interrelationships of success factors across different stages in university-industry
        linkages exist?
3. Analyzing personal characteristics of individuals engaged in UILs
   3.1. What is the impact of an individuals’ prior experience in UILs on their behavior in UILs?
4. Analyzing the implementation of organizational structures to the individual level to foster
   individual UIL activities
   4.1. How does the organizational level connect with the individual level in supporting and
        fostering UILs?
While one literature review addressed the effect experience has on the organizational and individual level, the second research objective covered the interpersonal aspects in UIL activities. The third research objective was dedicated to the individual and his/her behavior, due to having experience in UILs. Lastly, the connection between the organizational and individual level, under consideration of both having experience in UIL activities, was investigated in research objective four.

It was constituted that individual, interpersonal and organizational factors play an integral part in making UILs work. Each of the three aspects is investigated under consideration of the factor experience. Here, in particular the aspects of individual experience, as well as the organizational experience on a strategic and operational level, contribute to the development of UILs in universities. It is not to say that one factor is more important than the other it is rather an interplay, combination and inter-linkage of all three. The dissertation takes this fact into account by means of empirical data generating results that are focused on the effect experience has on the individual, interpersonal and organizational level, all providing impulses for institutionalizing UILs in universities.

Because of the fact that the dissertation considers the individual, interpersonal and organizational factors separately in each chapter, one cannot yet draw a conclusion regarding the greater importance of one specific factor over the others. For instance, for UILs to emerge, all three components play a relevant role. Not all levels are necessary at the same time, however; they are interconnected with each other in a circular way. Without the individual characteristic of having experience in conducting UILs, it is difficult for a person to grasp the potential and opportunities of UILs. Interpersonal competencies are also crucial in this respect as an understanding and appropriate communication significantly supports the decision of a partner to work collaboratively. Finally, an effective and supportive organizational setting in the university must be present for UILs to develop and grow. Thus, it may be said that, while the organizational component rather serves as a framework for facilitating and supporting UILs in an institution, it is the interpersonal and individual factors that are more crucial in the actual implementation of UILs.

As much of the literature on UILs focuses on the practice of such linkages, this dissertation is a first step into formulating theory that is based on practices and thereby contributing to the theory of UILs. Using the generated insights from chapter 2-4, policies directed at institutionalizing UILs can be formulated more precisely. Further, with the developed theory on UILs, one can better predict what may happen in such linkages and one may not be prone to random activities but rather planned and foreseen behavior. In this respect, it has to be noted that UILs remain highly individual and therefore cannot be planned entirely.

3. Contribution to Theory and Managerial Implications

While each chapter elaborates on the contribution to theory and managerial implications in detail, more general aspects are formulated in the following paragraphs.

Contribution to Theory

Concepts and theories from relationship marketing, relationship evolution, organization management and strategic management aided in understanding and deriving theory applicable for UILs. Thus, insights for UILs can be transferred back to these literature strands and thereby advance them.
Foremost, the concept of experience in respect to UILs is enhanced, as the findings of the dissertation clearly support the view of measuring experience based on the number of UIL activities performed. In understanding and advancing UIL theory and literature, experience has proved to be a significant indicator to measure UIL outcome. Not only does the effect of experience present key insights into UIL literature but also contributes to the understanding of alliances and therefore to the strategic management literature in general.

Including the factor experience in other kinds or relationships would certainly extend relationship marketing and relationship evolution literature. Considering the findings of chapter 2 and 3, the identification of three phases, in which the same success factors (individual, communication, trust, understanding, and outcome) are applicable, however in different extents, certainly may be transferred to other types of relationships. Also the interrelationship of these success factors provides great potential to adapt and apply it to organizations/individuals involved in partnerships. The findings add further insights in illustrating the complexity among actors in relationships. The discussion of whether individual or organizational aspects are more relevant in explaining UILs can be moderated and extended. Individual and organizational aspects are equally important; however they gain relevance, depending on the phase of a UIL. Organizational aspects may be of greater importance in terms of providing the structural environment, whereas individual factors, such as experience, find more relevance in the initiation and actual collaborative work. The extension of factors to be considered in explaining UILs refers to the interpersonal aspect (chapters 2, 3 and 4). In this case, the interpersonal factor refers to the individuals actually involved in the linkage. Therefore, the proposition of Phan and Siegel (2006) to consider individual, institutional and organizational aspects for a better understanding of UIL activities needs to be extended by the interpersonal factor.

The dissertation sheds light into the actual practice of UILs on the organizational and individual level and thereby offers a better understanding in conceptualizing theory for UILs. Aligning the organizational with the individual level and engaging in a constant exchange of experience proved effective in institutionalizing UILs at universities (chapter 5). Developing theory on UILs is useful in order to plan and manage such linkages in a structured manner, as opposed to UILs activities happening randomly and incidentally. The planning, initiating and managing of relationships among different institutions and individuals are also relevant aspects in strategic management and organization management. The findings therefore advance both literature strands.

**Managerial Implications**

Even though the comprehensive of the dissertation provided insight into better understanding and developing measures to institutionalize UILs, the dissertation holds practical implications. As such, university management must address and provide structures where individuals and interpersonal relationships can grow, with the overall aim of institutionalizing UILs. Relationships, and therefore UILs, remain a people-business and thus it is of importance for university management neither to neglect this fact nor to forgo the opportunity to benefit from it. Recognizing the effect prior experience has, is a first step into developing appropriate structures and a learning culture, which is facilitated by integrating those individuals into key processes for strengthening UILs. It is not only the relationship between the individuals directly involved in UIL activities that matter, but also the relationship of the individual academic researcher with the university management or TTO. A trusting relationship among the different levels (organizational and individual) within a university is crucial and beneficial to drive UILs at the institution. Therefore,
competent and knowledgeable staff supporting academic researchers in their UIL activities is in the interest of the university. The discrepancies between university management and the individual level, with respect to appropriate supporting mechanisms targeted at driving UILs need to be managed by continuously engaging in an open dialog and thereby effectively communicating with each other.

4. Limitations and Further Research Directions

Despite the fact that the chapters provide an extensive and detailed insight into the relevance and interrelationships of personal, interpersonal and organizational factors in UILs, several limitations to the chapters and further research directions can be formulated.

Limitations

As the data in chapter 3 was originally gathered in Australia and Germany, one cannot draw any comparisons to identify similarities and differences about the interrelationship of success factors between the countries. This was due to a too small response rate in Germany. Therefore, the results only apply to Australia. It has to be considered that, due to the advanced experience in conducting UILs in both countries, a similar outcome can be assumed. Due to the complex structure of UILs, several stakeholder groups need to be considered in the analysis to fully comprehend the topic. Chapter 3 specifically did not include data from industry representatives. Thus, the interrelationship between the success factors is only true for academics and cannot be extended to industry. In this respect it would be beneficial to set up an additional research study and detect potential similarities/differences.

Throughout chapters 2-5, the experience level of participants was a key factor for analysis. The authors did not specifically categorize the participants into groups that indicated the actual years of experience. Therefore, the authors relied on the answers of the participants and their judgment of present experience level.

Further Research Directions

Based on the conducted research, the following further research directions can be given.

In light of institutionalizing UILs at universities, additional (international) case studies outlining mechanisms undertaken to align the organizational level with the individual level present great opportunities for academics and university management to learn and benefit from other practices. Specifically, mechanisms for both levels need to be looked at more in depth, to be able to better draw recommendations. To close the gap between the organizational and individual level, future research should focus on the formulation of theory specifically in UILs to advance the literature.

The topic of experience presents a vast research area in general. Since the data in chapters 3-4 are retrospective, it is interesting to conduct longitudinal studies addressing the relationship of academic researchers and industry representatives, in which the aspect of prior experience is central to the investigation. Specific mechanisms relating to incentivizing academics with differing experience levels in conducting UILs present another future research area. One could document whether different incentives have effects on UIL activities in general and on UIL intensity, specifically for newly appointed academics.
It would be of interest to uncover and compare the types of UILs activities\textsuperscript{17} performed with advancing experience levels of academic researchers, either having gained experience in industry or having experience in conducting UILs in general. The reasoning behind it is that, commonly, academics start with a few UILs activities and expand their activity range with advancing years of working in UILs. The results would provide a clearer picture of what kind of mechanisms need to be installed on behalf of university management for academics with different experience backgrounds. That way university management can guide individual UIL activities by offering only certain incentives for a certain extent of UIL activity.

Linking the findings of the dissertation to the new role and task of universities in producing scientific knowledge in the scientific system (Gibbons et al., 1994, Etzkovitz and Leydesdorff, 2000), another further research direction can be formulated. It would be of interest to investigate the connection of the “third mission” and the remaining two missions of a university, under consideration of the changing structures at that institution, for facilitating the mission of contributing to innovation a change through UILs. It may be possible that certain structures beneficial to mission 3 may not be favorable for mission 1 and 2.

\textsuperscript{17} Davey et al. (2011a, p. 27) categorizes UIL activities into the following specifics “collaboration in R&D, commercializing R&D results, mobility of students and staff, curriculum development and delivery, entrepreneurship, governance and lifelong learning”.

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