UNDERSTANDING CONFLICTS IN INTERORGANIZATIONAL INNOVATION TEAM THROUGH SCHEMAS

- A CASE OF COOPERATION BETWEEN HIGHER EDUCATION INSTITUTIONS

Kristian Philipsen[1], Ph.D., Associate Professor, Department of Entrepreneurship and Relationship Management, University of Southern Denmark, Universitetsparken 1, DK-6000, Kolding
+45 65501376, kp@sam.sdu.dk

Jesper Piihl, Ph.D., Associate Professor at Department of Entrepreneurship and Relationship Management, University of Southern Denmark, Universitetsparken 1, DK-6000, Kolding

+45 6550 1359, jpi@sam.sdu.dk

Work in progress paper

32ND IMP Conference, Poznan Poland, 30.08 – 3.09.2016

ABSTRACT

This paper investigates how conflicts in inter-organizational innovation team can be better understood through schemas. Most IMP investigations of conflicts in networks mainly focus on interests and intentions as sources of conflict while the schema of actors as source of conflict is not well understood. On the other side the IMP investigations of schemas, mental models or network pictures is dominated by focus on consensus approaches to relationships. Conceptually the paper develops the schema or mental model aspects of the ARAS model (Welch and Wilkinson 2002) by adding an explicit conflict perspective. The developed theoretical frame for sources of conflicts is used to investigate a special case about cooperation in an inter-organizational innovation team with members from three types of higher educational institutions with significant different schemas about teaching and learning. The case is special in the sense that it is not normal in Denmark that represents for three types of higher education institutions cooperate about an educational innovation. The intention and interests differ among involved actors, but play a minor role as source of conflicts and can thus not explain the major part of conflicts. Conflicts from schemas seem to be hard to fully recognize for actors, because actors' assumptions or reflections about own mental models can be more or less conscious. Investigation of the cooperation among involved actors is used as a prism to investigate the importance of schemas as an important source for understanding conflicts in the innovation team. The empirical investigation is based on minutes from the innovation teams meeting, observation of and participation in the innovation teams meetings and also interviews with the members of the innovation team and finally document studies of the three types of higher education in Denmark. The paper contributes to develop the schema aspects of the ARAS model from a conflict perspective. Furthermore the paper discusses the theoretical and managerial implications of the findings.

Keywords: conflicting schemas, ARAS model, innovation team, higher education.

[1] Corresponding author

INTRODUCTION

This paper claims schemas or mental models among individual and organizational actors are important for understanding conflicts in innovation projects in network. Though a number of studies within IMP acknowledge the existence of conflicts as a major driving force behind developments and changes of network and thus a fruitful perspective to use (Easton 1992; Welch and Wilkinson 2005; Vaaland and Håkansson 2003; Munksgaard et al. 2012) the dominating approach to analyze dyadic or network relationships are consensus approaches or approaches acknowledging conflicts but put emphases on investigating the positive or consensus side of relationships.

The importance of schemas or mental models has been underestimated in existing studies as a source to conflict. In the IMP studies reviewed in this paper the sources of conflicts among the participating actors are related to intentions and interests e.g. value creation of the actors. The investigation of the empirical case about cooperation between 5 higher education institutions from three different types of higher education in this study suggests a high level of conflicts of which disagreements about intentions, interests and value creation only account for a minor share. In October 2015 the managing director of The Danish Evaluation Institute, responsible for monitoring Danish certification of higher educations, was visiting one of the higher education institutions and was presented for the course, among a number of other educational activities, and responded this way to the orientation about the course: “How have you been able to develop a course across educational institutions and educations which have various educational purposes and various regulations?”

The aim of the study is to develop a framework for understanding sources of conflicts and possible outcomes of conflicts in innovation teams with special emphasis on investigating the role of schemas. The aim is also to use the framework to achieve a better understanding of the sources of conflict in an empirical case about an innovation team, with represents from five higher education institutions. The innovation team has the task to develop a common course in innovation and entrepreneurship.

The paper is organized in the following way. A literature review is conducted encompassing theories about schemas and mental models within business marketing with special emphasis on the schemas element in the ARAS-model (Welch and Wilkinson 2002). Then a literature review of a conflict perspective on network cooperation is conducted with the aim to investigate the main sources of conflict including whether the schema or mental model aspects has been investigated in existing theory. Based on these literature reviews an analytical model, based on a conflict perspective and adding understanding of schemas, is presented. The analytical model is used to analyze the empirical case about how to improve understanding the sources of conflicts in an innovation team. Cooperation about a common innovation project between three different types of higher educations are not common in Denmark and thus the studied case can be viewed as a special case offering insight in the role of schemas as source of conflicts. The investigation of difficult-to-grasp schemas makes a challenge in the empirical investigation. A description of principal differences between the three types of higher education institutions are used to formulated expectations to differences in schemas among the involved actors in the innovation team. In the method section a description of how the investigation includes the three levels in the ARAS-model: organization, coupling and configuration are described. The paper ends with a conclusion and a discussion about the implication of the findings for research in the IMP and business-to-business marketing and for management.

THEORETICAL FRAME

Theories about schemas and mental models in business marketing

An investigation of how various approaches to schemas have been investigated in IMP business marketing reveal three theoretical explanations: network pictures, institutional logics and the ARAS model. We will describe the three approaches and argue why we have chosen to make use of and elaborate on the ARAS-model with input from the institutional logics approach in this paper.

The concept of network pictures has been used to investigate managers' subjective mental representations of their relevant business environment (Henneberg et al. 2006; Ramos and Ford 2011). The manager act and react upon activities, resources and actions from other actors in the network and change perception of network, network picture, according to the flow of episodes taking place in the network. The network picture can be partly unconscious. The network pictures are formed by and changed by the person's experiences including experiences with relationships to other actors in the network. Network pictures thus change over time according to new experiences and change in perception by the manager. Our major concern with using this approach in the analysis is the more or less constant changes in network pictures. Schein (1992) makes a distinction between three levels in the cultural analysis. *Artifacts*: visible organizational structures and processes (hard to decipher); *espoused values*: strategies, goals, philosophies (espoused justification); and *basic underlying assumptions*: unconscious, taken-for-granted beliefs, perceptions, thoughts, and feelings (ultimate source of values and action). We assume schemas and mental models belong to the basic underlying assumptions. Schein state that the basic underlying assumptions are long-lasting values which means they will typically be changed slowly over time. This does not fit well with the idea of network pictures described above.

A theoretical research agenda offering an understanding of the role of schema and mental models is institutional logics (Tornton et al. 2011). Institutional logics is defined as "the social constructed, historical patterns of cultural symbols and material practices, including assumptions, values, and beliefs, by which individuals and organizations provide meaning to their daily activities, organize time and space, and reproduce their lives and experiences" Thornton and Ocasio (2008). Thornton et al. 2011 p.2) argue the institutional logics perspective is "a meta theoretical framework for analyzing the interrelationships among institutions, individuals, and organizations in social systems". Yang and Su (2014) describe the potential use of the framework, but also highlight challenges of using the framework within a relationship approach. These challenges seem to be substantial and this make us decline from using this approach as analytical frame, but we will make use of a contribution from this approach and integrated it in the ARAS-approach.

In this paper we will make use of the framework propose by Welch and Wilkinson (2002) because it fit the network approach, but also because the concepts and possibilities to operationalize the concepts in a network perspective make sense and suits the approach chosen in this study.

Welch and Wilkinson (2002) claim the ARA model need to include an extra element, an element of ideas, mental models or the concept schema defined as "the systems of ideas underlying an organization's actions and responses" (Gell-Mann 1995). In figure 1 the schema dimension has been added to the ARA model (Håkånsson and Snehota 1995) where a

detailed description of the ARA-model also can be found. The schema is related to the analytical level of the organization. Both an organization and individuals can have schema and the schema will be formed, reproduced and changed through the interaction within the company and with external actors. The schema can be explicit or tacit and the schema can be embedded in production equipment or organizational procedures. In the relationship between two companies various schema are coupled. Coupling refers to "the way the schemas of two organizations become interrelated and adapted to each other over time in such a way as to be consistent. Schema couplings are driven by the desire for people to maintain consonance among their various cognitions, including those related to the ongoing experience of interactions with the relationship partner." (Welch and Wilkinson 2002:33). The configuration of schema relates to the network level and refers to "the pattern of co-adapted ideas characterizing a network and which underlie its functioning. Other terms that suggest themselves as descriptors of the pattern of beliefs and values underlying network action and response are network cultures, paradigms, ideologies or recipes." (Welch and Wilkinson 2002:33). The definition of schema is similar to the definition of network pictures in the sense that both theories emphasis that schema can be change over time. Nevertheless we find the definition of schema is closer linked to belief and values and thus to the more fundamental factors guiding action in line with the argument by Schein (1992). Furthermore we find the level of analysis fit our empirical study and the concepts easier to operationalize compared to the two other approaches.

All three elements, organization, relationship and network, fit the analytical levels in the empirical study undertaken in this paper.

Figure 1 The ARAS scheme of analysis

	Organization	**Relationship**	**Network**
Activities	Activity structure	Activity links	Activity pattern
Resources	Resource collection	Resource ties	Resource constellation
Actors	Organizational structure	Actors bonds	Web of actors
Schema	Schema	Schema couplings	Schema configuration

Source: Elaborated version of Welch and Wilkinson (2002 p. 33). The "schema" at the left in the figure is called "ideas" in the figure in the quoted source. The order of the four elements in the table has been changed so they form the concept ARAS.

The framework described in figure 1 will be further developed in the next section to analyze schema couplings and schema configurations in a team in the network.

Conflict perspective

With a conflict perspective we refer to the ideas about network cooperation seen as being driven by conflict or, dialectic: "…dialectic theory, begins with the Hegelian assumption that the organizational entity exists in a pluralistic world of colliding events, forces, or

contradictory values that compete with each other for domination and control" (Van de Ven and Poole 1995 p.517).

Deutch (1973) defines conflict as: "A conflict exists whenever incompatible activities occur".

We will make use of the definition of conflict and integrate it into the analytical frame below. Dreu (2006) has investigated to which degree conflicts in innovation teams support or hinder teams to fulfill tasks. He found that too little and too much conflict hinders the team to function well. We find this support a conflict perspective is relevant to use in an investigation of innovation teams. A more nuanced understanding of sources of conflicts in teams will be described in the next section.

Combining schemas and conflict

The schema of both individuals and a company may not be shared by all groups in a firm or by all individuals. Dunn and Jones (2010) argue that more than one schema may exist in an organization at the same time – they talk about institutional pluralism. We recognize several schemas may exist simultaneously, but will investigate the empirical case with the assumption that one schema will dominate the represents from the educational institutions. This assumption will be discussed in the discussion section at the end of the paper.

With an empirical case with focus on a team we have been searching for models to understand how teams handle and make decisions about different schemas.

A useful distinction is developed by Smith and Tushman (2005) who have investigated how to manage contradictions. They identify two strategies for leader teams to handle contradictions: a leadercentric team and a teamcentric team at an organizational level. In the leadercentric team the leader handle the contradictions. This is done by having a supportive integrator with close and trustful relation to the leader. There are extensive interactions between the leader and members. So the leader solves the contradictions by collecting information and makes a decision by handling the contradictions in his or her head. The president's approach to handle contradictions is portrait this way. Well the project group did not work this presidential way, but more in the teamcentric team way. Here the members of a group solved contradictions in a real team with multilevel roles, goals and rewards and the members of the group have frequent high-quality team interactions. A basic element is that the group members have to develop a shared mental model according to the theory. This teamcentric team approach contributes to understand how team works. The premise that the team has to develop a common shared mental model was certainly not fulfilled when the innovation team started to develop the course as will be described in the empirical section.

A contribution to understand how different and contradictive institutional logics are handled at an organizational level is proposed by Besharov and Smith (2014). They have noticed that empirical investigations of effect of contradictive institutional logics came to different and often conflicting conclusions which created a research puzzle about the outcome of multiple logics in organizations. This inspired them to come up with a new model being able to explain these various results. They propose a model with two main dimensions: degree of centrality and degree of compatibility and form a 2 x 2 matrix model with high and low degrees on both dimensions. The concept of compatibility fit with the description and definition of conflict presented above. In table 1 we have elaborated on their model and

transformed it to fit with analysis for a team in a network and use the concepts of schema instead of institutional logic.

Besharov and Smith (2014) argue the model is developed to understand how multiple institutional logics can be present in an organization at the same time and give explanations for how the multiple logics may co-exist e.g. when the institutional logics are compatible and when they conflict. We have argued that institutional logics also work with schema and the model can thus also be used in a network context. When investigating the sources of conflicts when different schemas are coupled and configured, as described in the ARAS model in figure 1, this model proposed by Besharov and Smith will be used to investigate and explain in more details how it takes place.

Table 1 Coupling and configuring of multiple schemas in networks

Degree of centrality	**High** Multiple schemas are core to organizational functioning	*Contested* Extensive conflict	*Aligned* Minimal conflict
	Low One schema is core to network functioning, other schemas are peripheral	*Estranged* Moderate conflict	*Dominant* No conflict
		Low Schemas provide contradictory prescriptions for action	**High** Schemas provide compatible prescriptions for action
		Degree of compatibility	

Source: An elaborated version of Besharov and Smith (2014 p.371)

The concept of compatibility in table 1 is defined as "…the extent to which the instantiations of logics imply consistent and reinforcing organizational actions." (Besharov and Smith 2014:367). Instantiations refer to the specific representation of logics in an organization.

The schemas may be related to goals or means and consistency between goals and actions are more important than means and action (Besharov and Smith 2014:367).

The other dimension, centrality is defined as: "…the degree to which multiple logics are each treated as equally valid and relevant to organizational functioning. Centrality is higher when multiple logics are instantiated in core organizational features that are central to organizational functioning and lower when a single logic guides core operations while other logics manifest in peripheral activities not directly linked to organizational functioning." Besharov and Smith (2014:369).

In the matrix model four types of schema multiplicity are described as outcome in four ideal types of organizations. The model can be used to investigate how and to what extend organizations embody various schemas. Rather than using the model as describing the

outcome in four types of organizations we will use it to describe sources and outcome of conflicts in a network cooperating in an innovation team where all four types of outcome are possible.

When centrality is high and compatibility is low the organization is *contested.* The presence of multiple schemas is crucial for the core functioning of the organization. The combination of presence of multiple schemas for the functioning of the organization and no clear guidance of action because of inconsistency between schemas means the level of conflict is high.

When both the degree of centrality and compatibility is low the organization is *estranged*. Here one schema is central and dominates the actions and functioning of the organization and the other schemas are peripheral. The level of conflict is moderate.

When both the degree of centrality and compatibility is high the organization is *aligned*. Here multiple schemas are present, but because of high compatibility the different schemas support guidance of organizational functioning which means the level of conflict is minimal.

The last type of organization characterized by low degree of centrality and high degree of compatibility is *dominant*. Similar to estranged organizations one schema dominates and because of high degree of centrality the organization functions in extreme cases as if it has only one schema. This type of organization has no or limited level of conflicts.

We will make use of this model in the empirical investigation, but give it a twist so it matches the aim of the paper. Instead of four ideal types of organizations we will use the model to characterize the sources and possible outcomes of conflicts in the cooperation between the higher educations and thus fit the coupling and configuration elements in the ARAS framework.

Sources of conflicts in IMP research

We will here review some examples of IMP studies using an explicit conflict approach to identify the sources to conflict they use in their analyses and argumentation. Munksgaard et al. (2012) have investigated conflicts in three cases of network cooperation. In their investigation they especially emphasis goals and interests among the participants in the interorganizational cooperation as source of conflict. Vaaland and Håkansson (2003) have investigated interorganizational conflicts in complex projects between buyers and sellers. They use the same definition of conflict by Deutsch (1973) as used in this paper and view conflicts as a sequence of episodes. They distinguish between latent conflicts (e.g. scarce resources, drives for autonomy and divergent goals) and perceived conflicts rooted in misunderstandings of the real intent or "each other's true position" (Vaaland and Håkansson 2003 p. 128). The also see conflicts as felt and thus personalized. They argue that manifest conflicts are most useful conceptualization of conflicts to understand frustrations among actors and these conflicts can be solved by using administrative procedures. They propose an understanding of conflicts as being both functional and dysfunctional in interorganizational conflicts. In a 2x2 matrix model the axis "degree" of collaboration" (high and low) and "degree of conflict" (high and low) form four output boxes: nice, marginal, well developed and hostile. Conflicts are dysfunctional when degree of collaboration is low and the degree of conflicts is high – this forms a hostile outcome of interorganizational cooperation. The other three types of outcome may be functional in the sense that conflicts may slow down the

process of making progress in interorganizational cooperation in the short run, but may speed up the process in the long run (Vaaland and Håkansson 2003).

Vaaland and Håkansson (2003 pp. 131-133) also describe various sources to conflicts in interorganizational cooperation:

- Degree of market instability: Higher degree of instability leads to higher degree of conflict.
- Dividing line of tasks and responsibilities between parties: Proper dividing lines of activities and tasks lower the level of conflict.
- Goal incompatibility, commitment and involvement: Can actors with conflicting goals cooperate? Normally not because parties joining a common project has to be able to recognize a win-win situation for themselves and other involved parties.
- Decision making. Parties with different perceptions of to how to make decision can cause conflicts.
- Decision makings among hybrids: Lack of understanding of the other part can lead to conflicts.
- Prior history: Experience from cooperating together normally lower conflicts because their share some experience.
- Reward and legal issues: There can be conflicts about rewards and about legal issues.
- Power, coercive and noncoercive: It is expected that use of noncoercive power will increase willingness to cooperate and lower the level of conflict.
- Perceived satisfaction with the other part: If partners are satisfied it is expected to lower conflicts.

Though not all the mentioned elements are relevant in this study the list is useful to identify sources of conflicts in interorganizational projects. The interest in this paper about elaborating on schemas to understand conflicts match the point about “decision making among hybrids” listed above.

METHOD

The investigation and analysis of the research questions will be conducted at three levels as described in the analytical model. The first level is used to describe and understand the various schemas in the organizations. We will argue that the schema in one of the three higher educations is not an organizational matter, but is a phenomenon which can be identified at industry level. The three types of higher education will be schemas which can be found across this type of higher education in Denmark and the educational system and how each of these reinforces these schemas. Therefore the schemas related to the three types of higher education will be investigated at network or industry level. Here the three categories of higher educations in Denmark are described by use of existing secondary material with focus on the two schemas relevant for this study including description of recent changes in schemas. The schema is linked to an understanding of the critical role of knowledge creation for students and teachers.

The empirical research question is answered by investigating a specific case of developing a course cross disciplinary innovation and entrepreneurship course among five actors from higher education institutions.

The unit of analysis used in this paper is “issues or themes of conflict” experienced and formulated during the work of the innovation team. Issues of conflict in a cooperation context like the innovation team does not mean that conflicts cover all types of conflicts, but rather conflicts with a potential to be solved as described in the analytical frame for schemas above.

The first part of the empirical analysis builds on minutes from the meeting in the innovation team. These minutes where written during the meetings – most time exposed at a TV monitor so all members of the group could see the formulations in the minute and react if they disagreed. At the next meeting the minutes from the last meeting was approved. In this sense the minutes mirror the discussions and disagreements rather precise e.g. the first meeting in January in the innovation group goes through a number of subjects and there are notes: agreed upon, do not agree upon and then a list for each subject was described. These minutes are used as the primary source for the empirical material about conflict issues in this paper. The minutes are supplemented with observations and further questions to members of the innovation team. One of the authors was member of the team as represents for one of the higher education institutions and also participated in the teaching. This means the method include elements of action research (Coughlan and Coghlan 2002). To get an arms’ length approach to data collection we have used a two-step approach.

First all the major issues of conflict and debate have been listed. The criteria for including issues are that they are listed in the minutes and the team has used some time discussing it. Some further issues may be included and some of the issues on the list may also be removed, but this will not affect the overall analysis and conclusion. Only exception is relevant actions taken before the innovation team was established like why the team was established and supported in the first place. These issues have been added to the list to make it more complete and give meaning to the whole project for the reader. Each issues of conflict is then described shortly and categorized, by the authors, as either a source of conflict mainly rooted in interest or schema. The description is based on the issues in the minutes, but the authors have used their understanding of the process to add details and explanations. Nearly all issues of conflict have elements of both interest and schema. We have solved this by describing each issue and then made a judgement of the main source of conflict. Then we describe how the each single issue was solved. For the issues of conflict categorized as rooted in schemas we also categorized the outcome based on the theoretical frame and the description. The categorization is made by the authors. First step in the data analysis end up with a categorization of issues of conflicts as either mainly rooted in interests or in schemas.

Second step of the data analysis is to summarize the findings from the first step concerning the conflicts rooted in multiple schemas and present them in the analytical framework for the paper. The second step also includes to categorize the sources of conflict found in the study using the list of sources of conflicts in the section about conflicts.

EMPIRICAL INVESTIGATION

In a Danish town, Kolding, with approximately 65.000 inhabitants four higher education institutions are located: Design School Kolding, International Business Academy, University College Syd and University of Southern Denmark. The campus leaders of each of these four institutions met on a regular basis a couple of times each year and at one of these meetings a discussion about establishing a common course, which students from the various higher education institutions could attend, was discussed. During the discussion of this theme they agreed upon investigating whether it was possible to establish a common course in

entrepreneurship. A constituent meeting took place in November 2014 with represents for both teachers and head of study for all the involved institutions. At this meeting a project group with represents from the four institutions was established. The aim of the group was to investigate whether it was possible to come up with a proposal for an entrepreneurship course where students from all the involved institutions could attend.

There was one represent from each of education institutions Design School Kolding, International Business Academy and University College Syd. From University of Southern Denmark there were two represents: one from the department of Entrepreneurship and Relationship Management (faculty of social science and business administration) and one from the Department of Design and Communication (faculty of humanity). Furthermore there was a represent for the organization Business Kolding who has the task to support the contact to local firms and industries and help students if they want to start own company after the course. So the project group, with the aim to investigate the possibility to establish and conduct a common innovation and entrepreneurship course, consisted of six persons. One person from the Design School Kolding was replaced with another person from the same institution during the first year.

The intention and goals to participate in developing and operating the common innovation and entrepreneurship course vary among the educational institutions but all were positive viewed it as a win-win situation. The UC Syd (professional bachelor students) is, according to the profile of the education, committed to offer courses within innovation. UC Syd had offered several elective courses, but because of too few interested students the courses was not established. International Business Academy (academy profession students and professional bachelor students) already offers several courses in innovation and entrepreneurship to students in the target group for this common course in innovation and entrepreneurship. The motivation to participate is put this way by the responsible for studies at International Business Academy: “it is cheaper for us to support a local course which can function as talent program for special motivated students compared to the costs of sending students to e.g. China for a short period”. The Design School Kolding (bachelor students) has a challenge with their students experience above average in unemployment when finished their studies and thus look for ways to improve this. Students participating in an entrepreneurship course could improve self-employment by students starting own firm. The Department for Design and Communication at University of Southern Denmark (bachelor students) does not offer a course in innovation and entrepreneurship, do not have the relevant competences to do so and would like to offer a course with this content to their students. Department of Entrepreneurship and Relationship Management at University of Southern Denmark (bachelor students) offer a business administration bachelor education within entrepreneurship and innovation. The students at this bachelor education are offered a course within innovation, but the entrepreneurship profile could be strengthened – a common innovation and entrepreneurship course fit this intention. The department has strong educational and research profile within innovation and entrepreneurship and thus also has an interest in increasing revenue from new educations.

Each of the five higher education institutions thus had individual intentions and goals for a common course in innovation and entrepreneurship. The involved institutions not only had a self-interests, but also a collective interest in aligning their goals and resource toward establishing a common course (Munksgaard and Medlin 2014). One of the main reasons for a collective interest was that none of the institutions were able to individually establish and run a course on their own, because of lack of students, resources or competences. Normally the higher educational institutions view each other as colleagues, but this might be better

described as a coopetition (Bengtson and Kock 2000) were they sometimes are competitors e.g. when recruiting students or attracting resources and sometimes partners who cooperate e.g. about developing and offering studies and courses together.

The students participating in the common course Innovation and Entrepreneurship were all from three types of higher educations which run for two or three years. In table two the distribution of students, attending the course, on the various types of higher education is revealed.

29 students started at the course in September 2015 and 16 participated in the whole course and passed the exam in January 2016. From four of the higher educational institutions students got 10 ECTS point for the ordinary study for passing the exam. For students from Design School Kolding the course was an extra curriculum to their study.

Table 2 Distribution of students in the course from the five higher education institutions

	International Business Academy	University College SYD	Design School Kolding	Department of Design and Communication	Department of Entrepreneurship and Relationship Management
Students started	10	7	7	2	3
Men	6	0	0	0	3
Woman	4	7	7	2	0
Students passing exam	9	2	0	2	3
Course: ECTS, extra curriculum	ECTS	ECTS	Extra cur	ECTS	ECTS
Academy profession education (2 year)	8	-	-	-	-
Professional bachelor(3 year)	2	7	-	-	-
Bachelor (3 year)	-	-	7	2	3

Schemas for the three types of higher education institutions in Denmark

A detailed description of learning goals for students at the three types of higher educations is revealed in table 3. The educations can be described within three headlines with subthemes:

- Knowledge and understanding (Knowledge field; Understanding and reflection level)
- Skills (Types of skills; Evaluation and decision-making; Communication)
- Competences (Action space; Collaboration and responsibility; Learning)

Table 3 Differences in learning goals for students in 3 categories of higher education in Denmark

	Academy Profession Degree (Erhvervsakademigrad)	**Professional bachelor's Degree (professionsbachelorgrad)**	**Bachelor's Degree (Bachelorgrad)**
Knowledge and understanding			
Knowledge field	Must possess development-based knowledge of the practice and central applied theories and methodologies of the profession and the subject area.	Must possess development-based knowledge of the practice and applied theories and methodologies of the profession and the subject area.	Must possess research-based knowledge of theory, methodology and practice within one or more subject areas.
Understanding and reflection level	Must be able to understand the practice and central applied theories and methodologies as	Must be able to understand the practice, applied theories and methodologies as well as reflect	Must be able to understand and reflect on theories, scientific methodologies and

	well as the profession's application of theories and methodologies.	on the practice and application of theories and methodologies of the profession.	practice.
Skills			
Types of skills	Must be able to apply the central methodologies and tools of the subject area as well as be able to apply the skills related to work in the profession.	Must be able to apply the methodologies and tools of the subject area as well as master the skills related to work in the profession.	Must be able to apply the scientific methodologies and tools of one or more subject areas as well as apply general skills related to work within the subject area(s).
Evaluation and decision-making	Must be able to evaluate practice-oriented issues as well as list and choose possible solutions.	Must be able to evaluate practice-oriented and theoretical issues as well as explain the reasons for and choose relevant solution models.	Must be able to evaluate theoretical and practical issues as well as explain the reasons for and choose relevant analysis and solution models.
Communication	Must be able to communicate practice-oriented issues and possible solutions to collaboration partners and users.	Must be able to communicate practice-oriented and academic issues and solutions to collaboration partners and users.	Must be able to communicate academic issues and solution models to both peers and non-specialists.
Competences			
Action space	Must be able to handle development-oriented situations.	Must be able to handle complex and development-oriented situations in work or study contexts.	Must be able to handle complex and development-oriented situations in study or work contexts.
Collaboration and responsibility	Must be able to participate in discipline-specific and interdisciplinary collaboration with a professional approach	Must be able to independently participate in discipline-specific and interdisciplinary collaboration and assume responsibility within the framework of professional ethics.	Must be able to independently participate in discipline-specific and interdisciplinary collaboration with a professional approach.
Learning	Must be able to acquire new knowledge, skills and competences related to the profession within a structured context.	Must be able to identify their own learning needs and develop their own knowledge, skills and competences related to the profession.	Must be able to identify their own learning needs and organize their own learning in different learning environments.

Source: (The Danish Evaluation Institute 2012)

The major difference between the three types of higher education is between the bachelor degree at the right side of table 3 and the two other higher educations, academy profession degree and professional bachelor's degree. The critical difference lays in the view on knowledge and which role creation of new knowledge versus use of existing knowledge has.

The idea behind the research based universities can be traced back to the ideas about a university formulated by Humboldt (1809/10). Humboldt advocates that universities should encompass both research and teaching. He also argued that science should treat knowledge as an inquiry of knowledge in-the-making: "What is particular about the higher scientific institutions is that they regard science as an unresolved and never quite solvable problem and thus always stay in research mode, whereas school is concerned finished and ready-made knowledge." (Wilhelm von Humboldt, 1809/10)

We find that higher educations with bachelors' degrees have the goal to follow the Humboldt idea about regarding science as an unsolved and never quite solvable problem with the emphasis on reflection about theories, methods and more subjects. The learning goal of the academy bachelor degree is very dominated by approaching knowledge as the finished and ready-made with the emphasis of core theories and methods used in the profession. The last category of higher education, the professional bachelor's degree, is a kind of mix between the

two. We will argue the goal of this education is most dominated by approaching knowledge as finished and ready-made, but also with elements of knowledge in the making. The term development-based is here difficult to interpret in the sense that it both encompass higher education, companies and professions, and research-based institutions. We will argue that because this type of institutions only have a few researchers, if any, then it is dominated by the idea of knowledge as ready-made.

In the European educational system a distinction between research-based universities and universities of applied research or high schools can be found in e.g. Holland where both types of universities have the right to conduct research (The Danish Evaluation Institute 2012:9). In the Danish system the role of knowledge has been changed in 2008 for higher education institutions offering Academy educations and Profession educations. Before 2008 these institutions should fulfill three knowledge criteria: it should be: "based on professions"; "based on industries" the educations have experience with hire students as employees etc.; and then it should be "research associated". The last thing can be interpreted as one of the sources to new knowledge should be research conducted at universities. The critic against this knowledge source has been that a number of professions have not experienced that research based universities actually conducted research to their specific professions, but rather to a more general purpose (Danish Evaluation Institute 2012:8). This may explain the change in the third criteria so it now is "development-based". Development-based refers to cooperation between higher development-based education institutions, firms from professions or industries where the students are supposed to be employed and research based universities or institutions. Development-based refers to new knowledge is developed during cooperation between these institutions and this knowledge is relevant to apply in the relevant industries and professions. The concept development-based is not very clear and how to interpret the criteria "development based" and fulfil the criteria is ambiguous for the higher educations under this regulation. Investigations of praxis among these higher education institutions are conducted to establish a consensus about the criteria (Danish Evaluation Institute 2012:8).

In the analysis of schemas as source of conflict we will not distinguish between the academy profession and the professional bachelor but labelled them both as development-oriented higher educations. The bachelor will be named research-based higher education.

Coupling and configuration of schema

In this section we will make use of the described developed framework in table 1 about coupling and configuring multiple schemas. The framework relate to the network and industry level in the ARAS model described in figure 1.

Table 4 A chronological mapping of conflict issues, sources of conflicts and type of solution to conflict in the innovation process of developing a cross disciplinary course in innovation and entrepreneurship

Month for recognizing conflict	**Conflict issues (taken from the minute from the meetings) Solution of conflict.**	**Most important source to conflicts** S = Schema	**Date for solving conflicts (conflict not solved)**

		I = Interest	
Nov. 2014	Did all 5 involved institutions have an interest in supporting the development of the common innovation course? Yes.	I	Nov. 2014
Nov. 2014	Did all 5 involved institutions find persons/resources for the cross institutional innovation team? Yes.	I	Jan. 2015
Nov. 2014	Apply for external funding to cover costs of development. Application written by two experienced persons outside the innovation team and sent January. Discussions about the content, structure, tasks and budget in the application because of different ways of doing it. One person took the lead in writing the application. Another person took the lead in the budget. A third person took the lead in re-negotiating the contract. Contract signed June and the project received 20.000 Euros in support for development of the course.	S (aligned)	June 2015
Jan. 2015	Which institutions should host the course? All institutions capable of hosting, but decision to choose a university.	S (aligned)	Jan. 2015
Jan. 2015	Use represent from Business Kolding as contact to firms and industry.	S (Aligned)	Jan. 2015
Jan. 2015	Question about merit for students. All students can get merit for course from research based university.	S (dominant)	Jan. 2015
Jan. 2015	Finding a name for the course. Ending with "A cross disciplinary course in innovation and", because it would be possible to communicate meaningful to students at all educations.	S (aligned)	Feb. 2015
Jan 2015	Fully agreement about the interdisciplinary approach at headline level, but not the exact meaning of the word and thus how to act on it in practice (agreed on elements like students should be able recognize elements from their own educational institution in the course and students should be able to reflect on their competence profile in relation to student group members with a different background)	S (contested)	Only partly solved
Jan. – June 2015	Content of course. Profile and content of course should differ from existing courses so it complemented not competed. Choose to offer both social and for profit innovation and entrepreneurship to aim at various groups of students.	S (contested)	July 2015
Jan. – feb. 2015	Language of textbook and compendium. One of the involved education institutions had promised their students only to use learning material in Danish language. The other educational institutions were used to English articles or textbooks. With the demand for Danish learning material one schema set the scene for all. It turned out an important theory and method only was available in English – and we asked the relevant students if it was OK with these articles.	S (estranged)	March 2015
June 2015	Articles for compendium: Research or consultant/ development based? Two of the members in the innovation team had previously been teaching together at an innovation course. Here they had used a specific model, the DIN-model which describes the process from idea to product from a design perspective. They want the DIN-model to be	S (contested)	Aug. 2015

	central in the course and teaching. The DIN-model was a consultant model e.g. with no references at all to literature (the first text-version was some Power point presentations). So others in the innovation team wanted an alternative model based on research so the students had a theoretical and methodological choice. All student groups ended up using the research based model in their projects.		
Feb. 2015	Problem-based learning versus lectures. A proposal for using 30 % on lectures and 70 % on problem-based learning which means the students have to investigate a business plan was agreed upon. In praxis different teachers did not follow this decision, but rather did what they were used to do.	S (contested)	Sept. – November 2015
Feb. 2016	How and what to exam? The innovation team had a hard time to find a workable solution because of different experiences and practices at each institution. Design School Kolding is used to no written work, except for a few pages and an oral presentation to exam. At the other end was the Department of Entrepreneurship and Relationship Management is used to written business plans on 20 pages including philosophy of science, theoretical and methods reflections and a budget & action plan. Here it became clear that The department of Entrepreneurship and Relationship Management follow the schemas described above for research based higher education whereas the Design School Kolding (also a research based higher education) put more emphasis on the skills and competence elements in the education compared with the knowledge and understanding elements. We ended with a written business plan with a budget and an oral group exam. The form and content of the oral presentation was up to student to decide on.	S (Contested)	July 2016
Jan. 2016	Conducting exam. Because of IT-problems some documents for the exam was not possible to print. This caused a delay in the exam and started a principal discussion about how to conduct exam. Some argued that the schedule for exam send to students should be kept no matter what. Furthermore that all the scheduled time for exam should be used. Others argued a delay could be acceptable and exam can be stopped before scheduled time if the teacher has a clear picture of the performance and grade.	S (Contested)	Jan. 2016
Jan 2015	Number of students from each institution. There was a debate about the number of students in total and from each institution. Because the project at the beginning included 4 higher education institutions in the town the number of students attending the course should be equal as communicating an equal cooperation. 40 students were the goal for the first course. This meant the two departments at University of Southern Denmark each could send 5 students. The actual number of students from each institution deviated from the expected.	I	Aug. 2015
April - Sep. 2015	Compulsory versus elective course. From a teaching point of view it did not work well with a mix between students	S (Contested)	Sep. – oct. 2015

	following the course on a compulsory and elective basis. The compulsory students stayed and nearly all got their exam. All elective did stop. This caused major problems in the teaching and students expressed at the evaluation at the end of the course that they thought it was disappointing that e.g. they did not have the possibility to work in group with students from the Design School Kolding and from UC Syd.		
Jan. 2015	Schedule of course. Finding a schedule that was acceptable for all involved educational institutions was really a puzzle because of differences in structures of studies. The length of semester varied between 15 weeks, 13 weeks, 2 – 9 weeks, 7 weeks and 7 weeks. The semesters did not start and end at the same time. Then the course had to fit with other courses which was not an easy task. Students from UC Syd should start in internship at the beginning of December and because some students at UC Syd had children the course would end at 15.00. We ended with a semester from beginning September to end of November. At the evaluation in May 2016 a course on 7 weeks was discussed. Three students from Design School Kolding left half trough the course because they got new courses which collided with the time schedule for this course.	S (Contested)	June 2015
April 2015	Place of classroom for course. It was decided to place teaching at "neutral ground" and thus follow the idea of the cross-disciplinary course. We had access to a classroom at the house of design. The students told at the evaluation that they would have preferred to have a classroom at University of Southern Denmark because it was a new building and with good facilities for group work.	S (aligned)	Aug. 2015
Feb. 2015	Economy and business model. At an early stage in the process a paper with economic calculations of the course was calculated and shared among the members of the innovation team. If revenues should exceed cost 35 students had to follow and pass the exam. The payment from the Danish Government comes from students passing exam so it was important that attending students did not leave the course without exam. With Department of Entrepreneurship and Relationship Management as the responsible for the economic aspects it raised a question about payment for students from Design School Kolding where some attend the course but none passed the exam. An agreement about payment was settled.	I	Feb 2016
Aug. 2015	Study administration. Department of Entrepreneurship and Relationship had the responsibility for hosting the course and thus also for the study administration. This was no success since there were substantial problems with enrollment of students, access to and use of intranet in the teaching, exam, re-exam and payment to teachers from the other education institutions.	S (estranged)	Aug. 2015 to feb. 2016

CONCLUSION

Of the 20 significant conflicts issues described in table 4, four has been categorized as mainly been caused by interests or goal of organization. Of the list of causes to conflicts in interorganizational cooperation mentioned by Vaaland and Håkansson (2003) we will argue the described interests can be linked to these causes:

- 5 higher educational institutions interest in supporting course and finding resources for the development team (goal incompatibility, commitment and involvement);
- number of students from each institution and economy and business model (degree of market instability; reward and legal issues)

Table 5 Summary of findings from investigation of sources of conflicts found through schemas

<table>
<tr><td rowspan="3">Degree of centrality</td><td>High
Multiple schemas are core to organizational functioning</td><td>Contested
Extensive conflict
• Profile and content of course
• Content of cross disciplinary course
• Content of course
• Research based or consultant / development based articles
• Problem-based learning or lectures
• Exam and evaluation criteria: Practice and hands on versus theoretical and methodological reflections
• Conducting exam
• Number of students from each participating institution
• Compulsory versus elective course
• Semester- and time schedule of course</td><td>Aligned
Minimal conflict
• Apply for external funding
• Host of course.
• Use of represent from Business Kolding as contact to firms and industry
• Name of course and common profile of course communicated to students
• Place of class room</td></tr>
<tr><td>Low
One schema is core to network functioning, other schemas are peripheral</td><td>Estranged
Moderate conflict
• Language of textbook and compendium
• Study administration</td><td>Dominant
No conflict
• Merit for course</td></tr>
<tr><td></td><td></td><td>Low
Schemas provide contradictory prescriptions for action</td><td>High
Schemas provide compatible prescriptions for action</td></tr>
<tr><td></td><td></td><td colspan="2">Degree of compatibility</td></tr>
</table>

Source: Elaborated version of Besharov and Smith (2014 p.371) with summary of results from the empirical study of sources of conflicts related to schemas.

The study has established a framework for analyzing the role of schema or idea logics at a network level by use of the ARAS model and the coupling and configurations of multiple schemas in networks. An understanding of differences in goals and schemas of three higher educations was described in details using the main categories knowledge and understanding, skills and competences. The findings from the case study investigating the role of ideas in networks is summarized in table 5. The discussions in the group and the disagreements based on different schemas and thus different ideas of the goal of the education and the goal of the higher education is placed in the various categories. In table 5 a pattern with a number of conflicts categorized as “contested”, some a categorized as “aligned” and a few as “estranged” or “dominant”. This gives an overall picture of an innovation team where multiple schemas were embodied in a number of tasks and activities.

We will argue this way of investigating schema is usefull and help explain the sources of disagreements and also describe space for coupling and configuration of a network.

The overall conclusion is that the proposed framework for understanding schemas gives a significant better understanding of sources of conflicts in the investigated empirical case about the innovation team compared to e.g. the sources of conflicts proposed by Vaaland and Håkansson (2003).

We will argue and conclude that the proposed ARAS-model and the three elements related to schemas in this model namely organization, coupling and configuration help giving a significant better and more nuanced understanding of conflicts themes in the innovation group. The organization-level in the model was investigated using descriptions of the three types of higher educations in Denmark. We have elaborated on this description and merged the three categories into two: development-oriented and research based and explained one of the core differences exists between knowledge as unsolved and on the way or as finished and ready-made. This gives significant differences in which role theoretical models and methods and relation to and development of practice and hands on have in the schemas among teachers at the two types of higher education. This line of conflict is difficult to understand from an interest perspective, but have a significant influence on conflict themes identified.

The model by Besharov and Smith (2014) has been elaborated in this study. With the axis “degree of compatibility” and “degree of centrality” 4 outcomes described as ideal organizations has been proposed: contested, estranged, aligned and dominant. In this study we propose to look at the four described outcomes as possible outcome in a network coupling and configuration. The coupling element in the ARAS-model may be linked to the compatibility axis in the model and the configuration element may be linked to the centrality axis. The advantage by the model of coupling and configuration of schemas in network is that the model can predict when some conflicts are extensive while others are moderate, minimal or not existing. The dominant finding in the empirical investigation is that a large number of the conflicts with schemas as source can be characterized as contested.

This means that though it is possible to identify an interest element in nearly all the conflict themes identified, the conflicts which can be understood from the schemas will be interpret as giving a better understanding of why conflicts occur in the innovation team. Second point is that none of the higher education institutions have a size so they can dominate the other institutions. Though the institutions differ in size they have in this cooperation been viewed as rather equal partners. This means that the conflicts probably have become more of the contested type.

DISCUSSION AND IMPLICATIONS FOR RESEARCH AND MANAGMENT

We propose the findings in this study have implications for other types of industrial marketing relations and not only within the public domain, but also for private companies in general where actors with different schemas cooperate. In general we will expect that companies or organizations cooperating with other actors operating in industries or sectors with divergent schemas will experience higher levels of conflicts caused by schemas compared to companies and organizations cooperating with companies or organizations from the same industry. We also expect that the level of conflicts will enhance when firms with employees dominated by one type of education and industrial training cooperate with another company where employees are dominated by another type of education and industrial training.

One example is international marketing where cultural differences are an obvious example of an important role of multiple schemas. Conflicts initiated by differences between marketing and production or operations are also classic conflicts. The same goes for e.g. cooperation between private and public companies or between for profit and non-profit organizations.

The five higher education institutions come from the same industry so why did they experience a high level of conflicts when we have formulated an expected low level of conflict because of the same industry? The short answer is that the higher education institutions seem to be in the same industry but the described difference between development oriented and research based educations are more significant than the common label “higher education” indicate. The result and conclusion from this study is that schemas related to development and research based higher education seem to give guidance to rather significant different actions.

We also have some critical comments to the findings. The main challenge has to do with the assumption made in the paper that the represents for each of the educational institutions are assumed to represent the schema of the institution. Is this assumption reasonable or could there be sources of failure in this? With the methods used in the investigation how can we be sure this link is established in the paper? We have thought improving the methods by asking how each of the five institutions normally develop new courses and then use this description to compare with the three/two national types of schemas for higher educations to make a triangulation of the assumptions described. This raises the question about how to conduct an empirical investigation of schemas in private companies. This paper contributes by offering a framework for analysis, but methods to conduct the investigation of schemas in private companies with no written descriptions as those national descriptions we have used has to be developed in future research. So shall the ARA-model be replaced by the ARAS-model? We suggest to do so but the relevance of the schemas has to be investigated and confirmed in further studies in different settings. The main argument for including the schemas and replace the ARA-model with the ARAS-model is that if schemas have a major influence on the perception and action of actors, as our study suggests, then they shall be included. The model proposed here also offer a new way to discuss the work be Vargo and Lusch (2004) about goods and service logics, because the logic can be viewed as another word for schema.

We will argue the proposed theoretical framework is fruitful to understand how ideas affect a network cooperation at a team level. We will also argue the used model with configurations of multiple schemas in networks can help understand how companies or organizations with different schemas may cooperate and where the differences in schema create conflicts in the cooperation and where it is more easy to solve or couple various ideas. In that sense it

contributes to extending the ARA model and the ARAI model. It also move focus from coupling and configuration described as the main elements in the ARAI model to more focus on conflicts and how to solve conflicts in coupling and configuration. It can also be used to understand e.g. not only the logics of goods and services (Vargo and Lusch 2004), but also investigate to which degrees these two types of idea logics are compatible or conflicts. This study has used an action research approach, but we do not think this is the only way to conduct research of ideas, schema, coupling and configuration which can be investigated by other qualitative research methods.

The implications for management is first to say that this study have found ideas and schema matters for firms, relationships and networks. This means managers and employees should be much more aware of differences in schemas. The proposed framework gives firm a better understanding of conflicts caused by schemas and also an understanding of why multiple schemas in network cooperation sometimes results in high level of conflicts and sometimes do not.

REFERENCES

Bengtsson, M., & Kock, S. (2000). "Coopetition" in business networks - To cooperate and compete simultaneously. *Industrial Marketing Management*, 29(5), 411–426.

Besharov, Marya L. and Smith, Wendy K. (2014) Multiple institutional logics in organizations: explaining their varied nature and implications, *Academy of Management Review*, Vol. 39, No. 3, pp. 364-381.

Coughlan, P. and Coghlan D. (2002) Action research for operations management, *International Journal of Operations & Production Management*, Vol. 22, No. 2, pp. 220-240.

De Dreu, C.K.W. 2006. When too little or too much hurts: evidence for a curvelinear Relationship between task conflict and innovation teams. *Journal of Management*, Vol. 32, No. 1, februar 83-107.

Deutch, M. (1973), *The resolution of conflict*. London. New haven (CT): Yale University Press.

DIN-modellen (2015), http://ddc.dk/wp-content/uploads/2015/03/DIN-model.pdf (April 2016).

De Dreu, C. K. (2006) When too little or too much hurts: Evidence for a curvilinear relationship between task conflict and innovation in teams, Journal of Management, Vol. 32, No. 1, pp. 83-107.

Gell-Mann, Murray (1995), "Complex Adaptive Systems" in The Mind, The Brain, and Complex Adaptive Systems, H.J. Morowitz and J.L. Singer, eds. Sante Fe Institute *Studies in the Sciences of Complexity*, Reading MA: Addison-Wesley Publishing Company, 11-24.
Humboldt, Wilhelm von (1809/10) "Über die innere und äussere Organization höheren wissenschaftlichen Anstalten in Berlin" (http://edoc.hu-berlin.de/miscellanies/g-texte-30372/229/PDF/229.pdf) (April 2016).

Håkansson, Håkan and Ivan Snehota (1995) Analysing business relationships, in Håkansson,

Håkan and Ivan Snehota (eds.), *Developing Relationships in Business Networks*, London, Routledge 24-49.

The Danish Evaluation Institute (2009) *Self-certification*, www.eva.dk
Henneberg, Stephan, C., Mauzas, Stefanos and Naudé, Peter (2006) Network pictures: concepts and representations, *European Journal of Marketing*, Vol. 40 Issue 3/4, pp. 408-429.

Munksgaard, K.B., Medlin, C.J. 2014. Self- and collective-interests: Using formal network activities for developing firms' business. *Industrial Marketing Management*, 43, 613-621.

The Danish Evaluation Institute (2012) Strategier for viden (strategies for knowledge). Første rapport fra projektet om professionshøjskolers og erhvervsakademiers videngrundlag og videnomsætning (first report about profession high schools and Academy professions knowledge basis and knowledge turnover), www.eva.dk

Ramos, C., & Ford, D. (2011). Network pictures as a research device: Developing a tool to capture actors' perceptions in organizational networks. *Industrial Marketing Management*, 40(3), 447-464.

Schein, Edgar (1992). Organizational Culture and Leadership: A Dynamic View. San Francisco, CA: Jossey-Bass.

Smith, W. K. and Tushman, M.L. (2005) Managing strategic contradictions, *Organization Science*, Vol. 16 (5) pp 522-536.

Thornton, P. H. and Ocasia, W. (2008) "Institutional logics". In R. Greenwood, C. Oliver, K. Sahlin-Andersson and R. Suddaby (eds.) *The SAGE Handbook of Organizational Institutionalism*, pp. 99-129. Thousand Oaks, CA: Sage.

Thornton, Patricia H. Ocasio, William and Lounsbury, Michael (2012) *The institutional logics perspective. A new approach to culture, structure and process*. Oxford.

Vargo, Stephen L. and Robert F. Lusch (2004), "Evolving to a New Dominant Logic for Marketing," *Journal of Marketing*, 68 (January), 1-17.

Vaaland, T. I and Håkansson, H. (2003) Exploring interorganizational conflict in complex projects, *Industrial Marketing Management*, 32, pp. 127-138.

Van de Ven, A.H. and Poole, M.S. (2005), Alternative approaches for studying organizational change, *Organization Studies*, 26 (9) pp. 1377-1404.

Welch, Catherine and Wilkinson, Ian (2002) Idea Logics and Network Theory in Business Marketing, *Journal of Business-to-Business Marketing*, 9:3, 27-48.

Yang, Z. and Su, C. (2014). Institutional theory in business marketing: A conceptual framework and future directions, *Industrial Marketing Management*, 43, pp. 721-725.