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Advancing Theory on Knowledge Governance: From Knowledge-Based Firms to Knowledge-Based Organizations

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Abstract

In an exploratory case study of a university merger, this study inductively examines how governance structures in universities impact the creation and exploitation of knowledge, both in core academic activities (research and teaching) and in related and supporting administrative tasks. Similarities and differences in relation to knowledge governance in firms are identified. The findings suggest that university governance arrangements provide advantages primarily in knowledge creation through intra-disciplinary articulation of tacit knowledge, and in the transfer of such knowledge through master-apprentice type of personal relationships, but make them inferior to firms in the pursuit of innovative, inter-disciplinary combinations of knowledge. The reasons behind these similarities and differences are explained, possible extensions of the knowledge-based theory of the firm are proposed and some tentative managerial implications for the organization of knowledge work in modern universities are outlined.

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ABSTRACT

In an exploratory case study of a university merger, this study inductively examines how governance structures in universities impact the creation and exploitation of knowledge, both in core academic activities (research and teaching) and in related and supporting administrative tasks. Similarities and differences in relation to knowledge governance in firms are identified. The findings suggest that university governance arrangements provide advantages primarily in knowledge creation through intra-disciplinary articulation of tacit knowledge, and in the transfer of such knowledge through master-apprentice type of personal relationships, but make them inferior to firms in the pursuit of innovative, inter-disciplinary combinations of knowledge. The reasons behind these similarities and differences are explained, possible extensions of the knowledge-based theory of the firm are proposed and some tentative managerial implications for the organization of knowledge work in modern universities are outlined.

KEYWORDS: Combination, Epistemic Communities, Interdiciplinarity, Knowledge-Based Theory, University Merger

INTRODUCTION

Research in recent decades has provided new insights regarding the problems and opportunities associated with the 'management of knowledge' and 'knowledge governance'. In areas ranging from strategic management to organization theory, theoretical developments and empirical research have focused on the nature of 'knowledge processes' in the governance context of business firms (D'Adderio, 2001; Dosi, Faillo, and Marengo, 2008; Felin and Hesterley, 2007; Foss, 1996a; 1996b; Galunic and Rodan, 1998; Håkanson, 2010; Kogut and Zander, 1996; Spender, 1996; Szulanski, 1996; Tsoukas, 1996), generally benchmarked against those that occur in arms-length market transactions (Grant, 1996a; 1996b; Kogut and Zander, 1992; 1993; Nahapiet and Ghoshal, 1998; Nickerson and Zenger, 2004). The so-called 'knowledge-based view of the firm', in various guises, is based on the idea that firms are in a privileged position to manage knowledge-intensive processes. Kogut and Zander (1992) present firms as gaining advantages from 'higher-order organizational principles' through which they become "social communities of voluntaristic action" (p. 384). In their conceptualization, the basis for the formation of such communities is the sense of identity that "… in modern society is bound with the employment relationship and its location" (Kogut and Zander, 1996, p. 503). In critique of this idea, Foss (1996a; 1996b) pointed to the importance of incentives and formal governance structures for the emergence of such communities. In firms, contractual arrangements mitigate the risk of opportunism and promote the emergence of trust, cooperation and information exchange, providing

incentives for employees to invest in the acquisition and development of firm-specific social knowledge that is of little or no value in other contexts (Håkanson, 2010).

By focusing on the governance properties of 'business firms' as compared to those of arms-length markets, however, this stream of research has omitted to examine other institutional contexts and knowledge governance configurations. This raises the question as to whether the theoretical arguments advanced apply only to firms, or whether they perhaps apply to organized, non-market interaction more generally. The premise in this article is that effective knowledge processes are not exclusive to firms – complex knowledge-intensive activities are undertaken in other types of organizations and within diverse institutional arrangements, including, for example, public service organizations (Nicolini, Powell, Conville and Martinez-Solano, 2007; Rashman, Withers and Hartley, 2009), professional partnerships (Greenwood and Empson, 2003; Robertson, Scarbrough and Swan, 2003), or even virtual Internet communities (Lee and Cole, 2003). In other words, 'knowledge-based theory' should delineate not only the advantages of business firms vis-à-vis markets but also the extent to which these advantages are present also in other types of organizations and institutional settings. There may well be instances where these can provide benefits unobtainable in business firms, and an understanding of these would provide a cornerstone to the development of a more general theory of knowledge governance with significant policy and managerial implications.

We hope to contribute to such a broader understanding of knowledge governance by inductively analyzing the 'natural experiment' offered by the merger of two British higher education institutions. This setting provides an institutional configuration that differs considerably from that which has informed most previous research on the creation, sharing and exploitation of knowledge, but in which there are prominent institutional locales for the governance of knowledge processes. Further, the organizational processes following a merger offer an opportunity to study the formation (or not) of boundary-spanning organizational communities, capable of bridging the cognitive gaps between specialized functional and professional 'epistemic communities'. As a disruption to the steady state, a merger (or an acquisition) generates new patterns of interactions with the external and within the internal environment (Heimeriks, Schujven and Gates, 2012; Nonaka, 1994; Zellmer-Bruhn, 2003). Such disruptions to the stability or resilience of taken-for-granted routines lead to their change and adaptation (Feldman, 2000; 2003). A merger, hence, has the potential both to strengthen the exploitation of existing capabilities and to create opportunities for exploration of new ones (Birkinshaw, Bresman, and Håkanson, 2000; Empson, 2001; Ranft and Lord, 2002; Zollo and Singh, 2004; Zollo and Winter, 2002).

The immediate aims of the study are therefore (1) *to develop a set of propositions as to how governance systems in universities affect and are affected by the characteristics of the knowledge processes undertaken within them*, (2) *to compare these to the correspondent structures and processes in business firms*, and (3) *to explore possible*

managerial and policy implications for university governance. The overall objective is to contribute towards extending the so-called 'knowledge based view of the firm' to a more general theory of knowledge governance in various kinds of organizational settings.

Similar to the well-known problems cultural differences cause to post-merger integration of business firms (Schweiger and Goulet, 2000; Schweiger and Walsh, 1990; Stahl and Voigt, 2004), this case study indicates that such differences can considerably impact the merger and integration also between organizations working under very different governance arrangements. Moreover, the impact varied greatly between the 'academic' (teaching and research) and the 'administrative' functions of the merged institutions, highlighting the need to discriminate between the two. As outlined in the subsequent analysis, knowledge processes in university administration are in many ways similar to those in other public service organizations, related to but also distinct from those in private firms; academic teaching and research constitute a distinct 'ideal type' of knowledge governance system.

The rest of the paper proceeds as follows. The next section presents the theoretical orientation of the study, emphasizing some salient features of knowledge processes and organizational structures in universities vis-à-vis firms[1]. Section three describes the empirical setting of the research. Following a background overview, sketching the evolution of the higher education sector in Britain, it describes the exploratory case study of the merger and subsequent integration of two British institutes of higher education. Section four details our methodology and the applied analytical approach. The empirical findings are presented in section five. It is divided into two parts. The first analyses the effects of the merger on administrative functions and their personnel, the second focuses on the effects on academic teaching and research. Section six presents the main theoretical contributions and few managerial implications. The concluding section summarizes the study, outlining how its findings may contribute to the development of a more general theory of knowledge governance in different institutional settings.

KNOWLEDGE PROCESSES IN UNIVERSITIES

In a highly stylized manner, the competences of universities can be divided into two groups, *administrative* and *academic,* with the latter devoted to two main activities, *teaching* and *research[2].* 'Administration' here denotes the routines and competences employed in the raising and allocation of resources, the management of external relations and the design of organizational structures, policies and rules to ensure

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[1] We have used a grounded, interpretive approach to derive many of the theoretical findings presented in this study. Consistent with such an approach, we would normally present the findings after portraying the data from which they are derived (Strauss and Corbin, 1990); however, for better clarity we adopt the more conventional practice of presenting the theoretical orientation first.

[2] For the purposes of the present study, we view organizations as providers of (primarily) research output and educational services. In this perspective, students are seen as clients rather than as members.

efficient performance. Structurally, these tasks are typically divided among organizational units at the level of the entire university, individual faculties or colleges, and those of individual schools, departments, or research groups. 'Teaching and research' represent the core activities of universities and is typically organized in the form of departments, institutes or research centers, most of which divide their time between the two activities.

The distinction is analogous to the one in business firms between 'organizational/economic' and 'technical' competences (Teece, Rumelt, Dosi, and Winter, 1994, p.19). The former are in many ways similar to the administrative competences of universities, and the latter, which includes "the ability to develop and design new products and processes" as well as "the ability to learn", parallels the skills employed in university research. The main difference is in the relative emphasis on teaching. In most business firms, teaching is primarily an activity undertaken to promote organizational growth. In reflection of their wider societal missions, in universities teaching is a main goal in itself.

A striking feature of knowledge governance in universities is the prevailing practice of organizing academic work according to specialized fields of knowledge. As a rule, members of departments, institutes and research centers belong to the same 'epistemic communities' – groups of individuals engaged in a common practice and sharing not only mastery of the codes, theory and tools of that practice, but also the tacit skills and experiential knowledge conferred by the practice in question (Håkanson, 2007; 2010; Holzner, 1968). Within such epistemic communities, exchanges involving *replication* of codified knowledge occur with ease in the form of information transfer between agents who share mastery of the codes employed by their discipline and who are familiar with the theories that provide meaning to the information in question (Figure 1). The mastery of the codes, theories and tools of a common academic practice and the practical and educational experience through which such mastery is attained not only facilitate the dissemination of codified knowledge and research findings through articles, books and in lectures, but also provide the basis for the passing on of less well articulated knowledge, as in the master-apprentice relationships between supervisors and PhD students.

In universities, knowledge creation largely takes the form of *articulation* – the process whereby the tacit knowledge informing practical skills is made explicit – and 'puzzle-solving' within defined disciplinary frameworks and paradigms (Kuhn, 1962/1970). In spite of insistent calls for more 'inter-disciplinarity' in order to address real-world problems that refuse to be organized around the lines of traditional disciplines (Clark, 1998; Mosey, Wright and Clarysse, 2012), knowledge creation through *combination* of knowledge elements from different disciplines and areas of expertise is the exception rather than the rule This points to a critical difference between knowledge creation in universities and that in firms. Indeed, the ability to accomplish and exploit innovative combinations of existing knowledge is in many accounts a distinguishing feature of hierarchical governance, providing a fundamental

rationale for the existence of business firms (Galunic and Rodan, 1998; Grant, 1996b; Kogut and Zander, 1992; Nahapiet and Ghoshal, 1998; Nickerson and Zenger, 2004).

Figure 1: Typology of Knowledge Processes

	Exploitation of existing capabilities	Creation of new capabilities
Within epistemic communities	*Replication*	*Articulation*
Between epistemic communities	*Integration*	*Combination*

Source: Håkanson (2010: 1812)

Universities thus differ in several fundamental and rather obvious ways from those of other types of institutional settings, including their objectives, ownership and financing, legal frameworks and governance structures (Deiaco, Homén and McKelvey, 2009; Deiaco, Hughes and McKelvey, 2012; Hughes and Kitson, 2012). However, there are also similarities.

Academic work in universities, as traditionally organized by discipline, is in some ways similar to that undertaken in small to medium-sized professional service firms, usually focused on one core area of expertise (Greenwood and Empson, 2003; Robertson et al., 2003). Here too, focus is on the application and refinement of work practices and skills specific to one epistemic community, with only limited, well-defined, and often routinized interfaces to other functional areas of expertise. In both types of institutions, master-apprentice relationships are important elements in the training of new members. In both, the moral hazards associated with such training – the undue exploitation of the apprentice's services on the one hand, and the misappropriation of the knowledge imparted, on the other – have traditionally been resolved in the master's favor through 'tournament career systems' and 'up or out' systems of promotion (Baden-Fuller and Bateson, 1991; Becker and Huselid, 1992).

Similarly, university administration bears strong resemblance to other public service organizations, where knowledge processes are not directed to profits and private ends but to 'public value', generally in ways mandated by external stakeholders (Rashman et al., 2009). Most administrative tasks in universities are organized in specialized work groups, among individuals with common cognitive backgrounds, such as those associated with specific professional or functional expertise – human resource

management, finance, accounting, registry, etc. Like in firms and public service organizations – but in contrast to most academic teaching and research – efficient day-to-day operations require *integration* of activities and decisions across professional areas of expertise and differing epistemic backgrounds (Boland and Tenkasi, 1995; Grant, 1996a; Lawrence and Lorsch, 1967). This requires investments in organization-specific integrating devices both by the universities themselves and by their employees. Examples include university wide information systems, common vocabularies and understanding of procedures, codification of rules and regulations, and definition of interfaces between departments.

RESEARCH SETTING

The higher education sector in Britain

European, and especially British universities, were traditionally organized into single-discipline-based schools or departments. Their focus and the priorities of their boards of directors typically emphasized teaching or research excellence, sometimes both. In this organizational setting, a broad range of scientific domains constituted a faculty base that could attract a large student body (Locke, 1989; Clark, 1998), with budget allocation systems favoring the offering of single-discipline programs to large numbers of students. In addition, the so-called Research Assessment Exercise (RAE) – later Research Excellence Framework (REF) – strongly emphasized publications in peer-reviewed discipline-based journals, thereby reinforcing the single-discipline structure (Lee, 2007). The resulting management practices tended to nurture a narrow, 'needle-shaped' teaching and research focus as a means to safeguard the financial sustainability of higher learning institutions (Mosey, Wright and Clarysse, 2012).

Over time, however, these organizational practices and prevailing regulatory regimes were increasingly perceived as detrimental to the ability of universities to address modern-day real world challenges often requiring a multidisciplinary approach (Mosey et al., 2012; Taylor, 2013). In response, U.K. governments have in recent decades devoted considerable policy effort to promote the creation of multi-disciplinary research centers. The objective has been to support the development of interdisciplinary capabilities to address current societal, economic and industry problems, perceived to require 'T-shaped' professionals undertaking research and teaching across traditional borders (Lee, 2007). To this end, the reliance for funding decisions on metrics of research excellence produced in evaluation schemes such as RAE and REF has been relaxed. To attract discipline-based academics to the new multidisciplinary institutes, these were granted various privileges, including more financial autonomy, flexible time schedules, better physical infrastructures, industry contracts and consultancy, as well as access to research students (Mosey et al., 2012). Alternative, matrix-type organizational structures began to emerge, nurturing individual academics with boundary-spanning roles to facilitate knowledge transfer from more traditional 'needle-shaped' academics (Wright, Mosey, Piva, and Lockett, 2010).

By and large, however, the overall impact of these initiatives has been limited. Long-held norms and traditions conspired with extant systems for both financial and reputational rewards to dissuade most researchers from undertaking the investments necessary to engage in risky inter-disciplinary work (Boardman and Corley, 2008; Kraatz and Moore, 2002). In contrast to the hierarchical governance of business firms, universities rarely provide incentive structures conducive to the context specific investments needed to overcome the epistemic boundaries between scientific disciplines (Davidsson, 2002; Håkanson, 2010).

The organizational context

The findings of this case study need to be understood in its organizational context, a merger between two British academic institutions, an internationally recognized university and an acknowledged art college. The art college was well-known for its pedagogical methods, including practice-based and media-and-methods inspeculative and self-reflective contemporary art. Its activities included art, design and architecture and landscape architecture; areas concerned not only with the development and transmission of codified theory and practice but also with the passing on of tacit, experiential and embodied skills acquired through practical trial-and-error. With a heavy emphasis on teaching, the art college had developed approaches, systems and structures to support all aspects of its educational provision, nurturing the distinctive culture of an 'art college' education.

The university tended to take a more historical, literary and theoretically-informed approach. It tended to have a more even balance between research and teaching and was generally more research oriented. This included also its School of Arts, Culture and Environment (ACE) which conducted teaching and research in architecture, history of architecture, history of art and music (merged with the art college and shaped together a unified college of art within the university). The school had a track record of cross disciplinary innovation, based on its links mainly with other schools and colleges within the university, but also with outside world including the art college.

The pre-merger collaborations between the two institutions created the backdrop for the merger, alongside the difficult financial situation faced by the art college. However, the latter clearly provided the impetus for the merger. The merger proposal expressed the objectives as follows:

> …while the fundamental objectives of the merger are academic, merger should ensure that, within future funding constraints, the art college academic strengths can be maintained and enhanced in a way that would prove extremely difficult in the current and anticipated economic and public funding environment were the college to remain an independent institution. (Merger Proposal, 2011, p. 7)

Cooperation between the two institutions can be traced back to the 1940s, when they began to offer a conjointly taught program (Figure 2). In the new millennium, several initiatives were taken to strengthen the collaboration, with the university first becoming the awarding body for the degree programs offered by the college, later

followed by the creation of an 'academic federation'. On the eve of the merger discussions, a joint school of architecture and landscape architecture was established. In 2010, following the success of this and other collaborations, a merger proposal was advanced. Subsequent to its approval the following year, the art college became formally a part of the university with the beginning of the academic year 2011-2012, offering courses in art, design, music, history of art, and architecture and landscape architecture.

Figure 2: The Merger Timeline and Previous Collaboration History
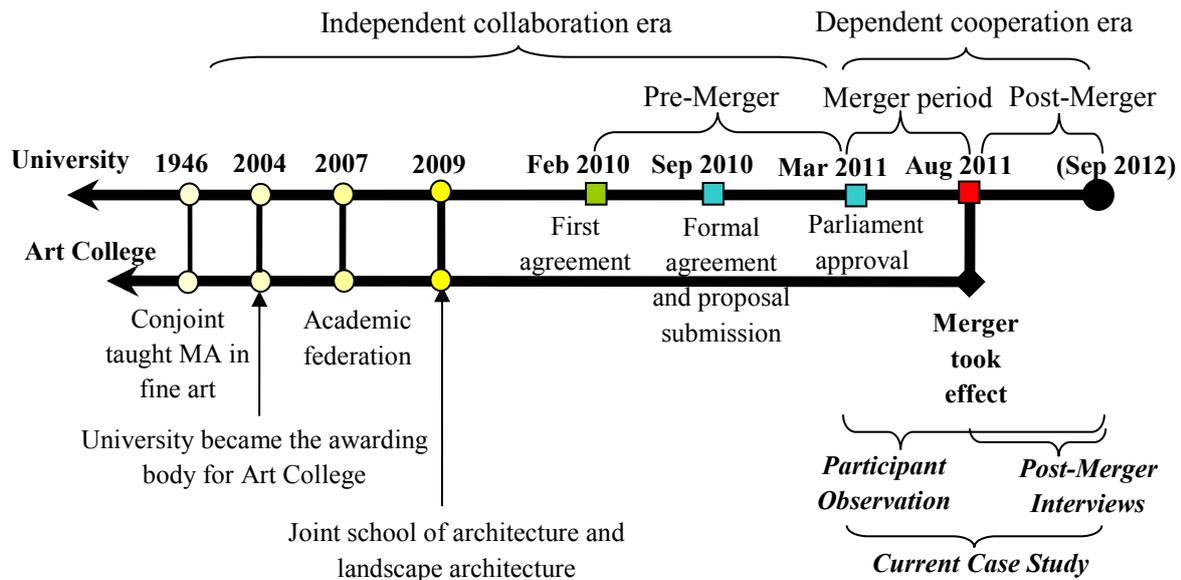
During the months between approval and implementation as well as in the post-merger era, the institutions had to work closely together, seeking to achieve planned synergy effects with a minimum of disruption to academic activities. Key administrative tasks were centralized for cost savings purposes, involving the implementation of new systems and procedures suitable for the art college, transfer of its staff and student records into the university system and integrating the information systems of the two institutions, alongside the creation of new joint programs and cross-disciplinary research centers. Drawing from the most successful disciplines in each institute, the flagship of the merger was a new cross-disciplinary Design and Informatics Centre, established with governmental funding support.

METHODOLOGY

Research Approach

Adopting an exploratory case study research design (Eisenhardt, 1989; Yin, 2003), we pursue a grounded theory approach (Strauss and Corbin, 1990) based on 35 in-depth interviews, roughly eighteen months of participant observation, as well as other primary and secondary documentation. The research aimed initially at exploring the potential for organizational learning which could be realized throughout the organizational integration processes. A case study methodology was appropriate

because of the exploratory nature of the topic, examining organizational transformation phenomena that need an in-depth inductive approach. As shown in figure 2, our approach is essentially longitudinal, covering three stages: pre-, during, and post-merger integration.

Research Procedures and Data Sources

Interviews: in order to capture multiple perspectives on the merger, we conducted 35 in-depth interviews both with leading key players in the process and with affected academic and administrative staff (Table I).

Table I: Interviews and Interviewees

	Organizational or Merger Project's Role	Organization (University or College)	No. of Interviews	Duration (in minutes)	Mode*	Timing (Pre- or Post-Merger)
1	Project Manager	U	2	60/60	P/P	Pre/Post
2	Project Officer 1	U	2	120/--	P/E	Post/Post
3	Project Officer 2	C	2	60/105	P/P	Pre/Post
4	HR Manager	C	1	70	P	Post
5	Head of HR	U	1	60	P	Post
6	Head of HR	C	2	60/--	P/E	Post/Post
7	Head of Registry	U	1	70	P	Post
8	Head of Registry	C	1	70	P	Post
9	Staff Union Member	C	1	60	P	Post
10	Head of PG Office	U	2	75	P/E	Post
11	Operating Officer	Ext. Temp. for C	1	60	P	Post
12	Principal	C	1	50	P	Post
13	Vice Principal	U	2	40/--	P/E	Post/Post
14	KM Vice Principal	U	1	70	P	Post
15	College Registrar	U	1	70	P	Post
16	Head of Admin	C	1	70	P/P	Post/Post
17	Dir. of Crp. Services	U	2	90/70	P	Post
18	Head of ESALA	CandU	1	60	P	Post
19	HoS of Art	C	1	90	P/P	Post
20	HoS of Design	C	2	70/20	P	Post
21	HoS of Informatics	U	1	30	P/E	Post/Post
22	Head of ACE	U	2	90/--	P	Post
23	Head of College	U	1	60	P	Post
24	Joint Program Dir.	U	1	50	P	Post
25	Join Centre Co-Dir.	U	1	55	P	Post
26	Join Centre Co-Dir.	C	1	70	P	Post
Total			35	1985		

* Modes include in Person (P) and Email (E)
** HoS: Head of School

The informants include the project manager, the project officers, the conveners of all integration working groups, the new principal of the art college, the heads of schools in the art college (including both old and new heads in cases where they changed), the heads of the departments in ACE, the heads of post-graduate and undergraduate programs in both institutions, the chief operation officers in different sections, human resources managers and staff, knowledge exchange managers and

registry officers from both institutions. The interviews thus cover a cross-section representation of the organizations. Three interviews were done before the merger, the remaining in the post-merger era. The interviews varied in duration from 30 minutes to 2 hours with an average of roughly an hour. All but three interviews were recorded, and 31 of the recorded interviews were transcribed verbatim.

Initial interviews included broad questions which helped to draw a big picture of the merger and the intentions behind it. At this stage, the interview questions probed such topics as the interviewees' day-to-day activities before, during, and after the merger, the changes in their perceptions of the benefits and costs of the merger, the biggest problem areas in the integration process and their causes, the least problematic (most straightforward) integration processes and the reasons for the unproblematic nature of those processes. Following a theoretical sampling approach (Strauss and Corbin, 1990), subsequent interviews were more structured and focused, targeting the main challenges, underlying causalities and effects. The discussions at this stage tended to focus on issues such as the centralization of administrations and operations, collaboration across academic disciplines and working together in cross-disciplinary centers and joint programs, and the level of integration achieved.

Observation and Archival Sources: In addition to interview data, the researchers had the opportunity to attend a few meetings of the merger integration working groups and observe the post-integration processes as academic members of the university. We used the observations and insights contained in the field notes taken to supplement the transcribed interviews. We also analyzed the minutes of all meetings of the integration working groups, public merger documentations, and published news, articles and university bulletins on the subject of the merger in order to enrich the research data. These data sources were also used to provide further details but more specifically to corroborate informants' statements where relevant.

Analytical Approach

We triangulate 35 interviews, roughly eighteen months of participant observation and the minutes of monthly meetings of the integration working groups, with extensive analysis of secondary documents developed by the merger communities. The unique chance to observe a merger in practice, before, during, and after the integration processes advanced the understanding of the phenomenon in a way which is impossible for mere post-merger studies by external examiners. We inductively analyzed the collected data adhering to case study research design techniques (Eisenhardt, 1989; Yin, 2003) and constant comparison techniques (Strauss and Corbin, 1990). The rich data resulting from this approach, accompanied by a comprehensive line-by-line open coding and memoing, formed the basis of our findings and discussion in this article. Comparisons of multiple respondents over time allowed the detection of similarities and differences. As outlined in the following section, this enabled us to identify conceptual patterns from our massive bulk of qualitative data (Strauss and Corbin, 1990).

Following the methods of examining the validity of inductive inquiry, we checked our emerging findings with our key informants by asking them to reflect on the derived insights. The theoretical findings of this study have also been presented at a number of academic conferences and managerial workshops on relevant topics – mainly merger between universities - as conference paper or key-note talk. This enabled us to incorporate their questions and comments in our process of theory development. Hence, our extended theoretical framework in this article has undergone several major revisions through time.
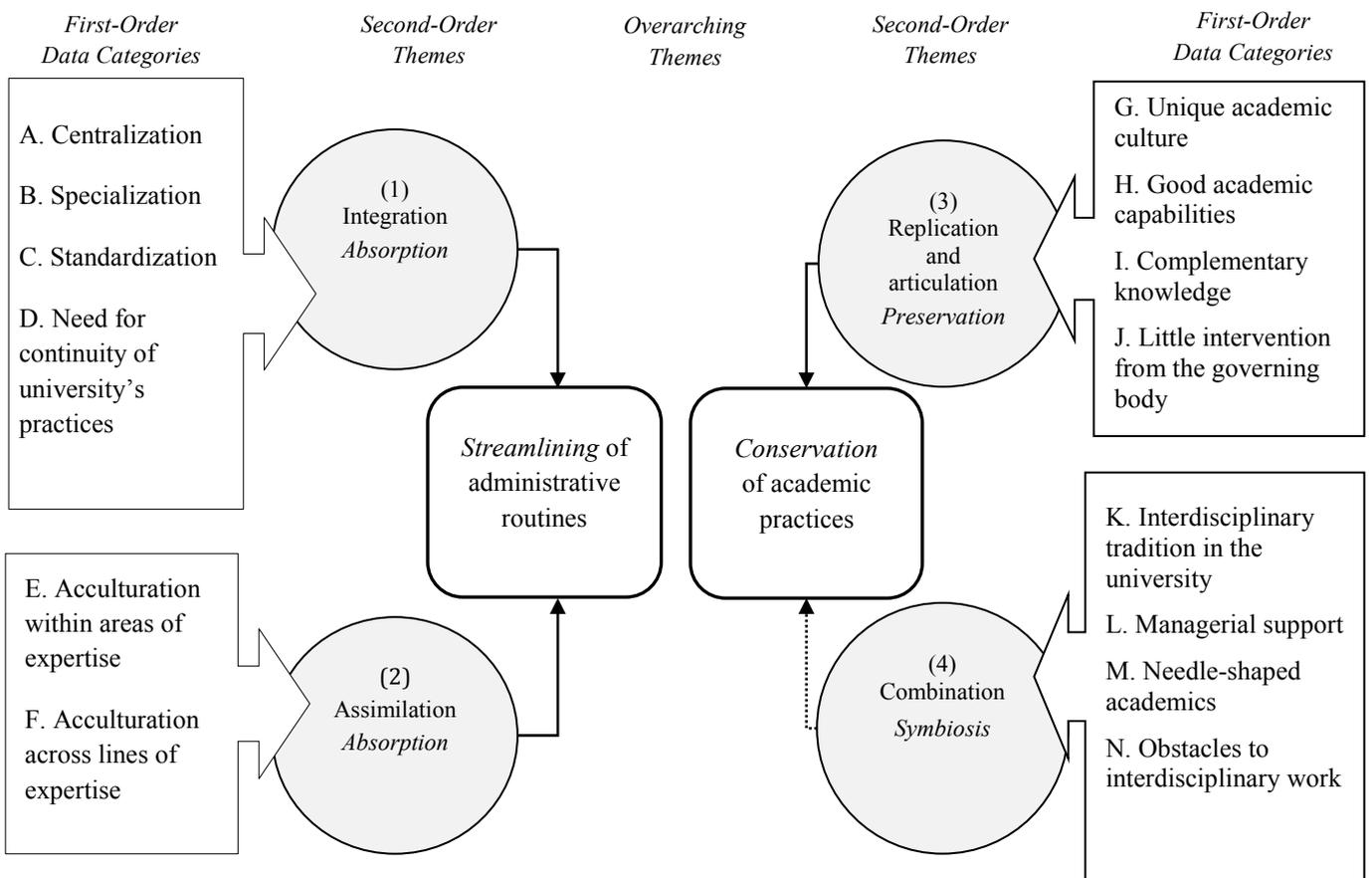
EMERGENT FINDINGS

As our observation of the merger progressed throughout the process of bottom-up coding, it became increasingly evident that the merger was perceived very differently by administrative and academic staff. For most academics, the merger implied only minor changes and was often seen to present opportunities of various kinds. At least initially, the effect of the merger on 'articulation', 'replication' and other day-to-day academic activities was generally limited. Although opportunities for synergetic 'combination' of knowledge across disciplines and epistemic communities were pursued, most evidently in the newly formed Design and Informatics Centre, for the most part, cost savings through shared and more efficient utilization of infrastructure and administrative services could be obtained without much disruption of day-to-day academic work, preserving the structure and relative autonomy of existing teaching and research units

In contrast, for many of the administrative staff in the art college, the merger led to big adjustments and was perceived as a threat to careers and job-security. Most of the changes were a consequence of centralization and standardization of processes and routines with the aim to reduce overheads and increase productivity. With very few exceptions, the procedures implemented were those in place at the university, reflecting an integration approach of 'forced assimilation' (Haspeslagh and Jemison, 1991), at least in the eyes of the Art School's administrative personnel. The difference between the two areas was described by one college HR manager as follows:

> I think they are two very separate mergers: academic merger and non-academic merger. I think they are very separate although both are in the same institution... [B]ecause the [academic] disciplines were so different, you were not going to have any real duplication of effort... There was no threat to that side...; a threat may come from having a duplication of departments, as with HR, finance, registry... So there were two very different mergers.

In reflection of these differences, we present the emergent findings separately for the administrative and the academic sides of the merger (Figure 3, Table II).

Figure 3: Emergent Findings Structure

First-Order Data Categories	Second-Order Themes	Overarching Themes	Second-Order Themes	First-Order Data Categories

A. Centralization

B. Specialization

C. Standardization

D. Need for continuity of university's practices

(1) Integration *Absorption*

Streamlining of administrative routines

E. Acculturation within areas of expertise

F. Acculturation across lines of expertise

(2) Assimilation *Absorption*

Conservation of academic practices

(3) Replication and articulation *Preservation*

G. Unique academic culture

H. Good academic capabilities

I. Complementary knowledge

J. Little intervention from the governing body

(4) Combination *Symbiosis*

K. Interdisciplinary tradition in the university

L. Managerial support

M. Needle-shaped academics

N. Obstacles to interdisciplinary work

Merging Administrations

On the administrative side, the post-merger integration focused on centralization, specialization and standardization, mainly to achieve scale economies, but also to ensure that administrative practices met both the university's own and other legal requirements in terms of transparency and equitable treatment (see data categories A, B, C and D). The financial difficulties of the art college were widely recognized, and the merger was generally seen as an opportunity to ease the financial restraints that had limited its development. As high level managers from both institutions mentioned in interview:

College: Art colleges are incredibly expensive to run. You can't have [afford] high staff-student ratio. It is very intensive teaching, big studio spaces, you need the latest equipment. All those sort of things can be shared in a larger university. That sort of investment is far easier to make. Then you can open up to other uses.

University: I also think that as a small independent institution, the focus of the old art college, because of circumstances, was on difficulties with finance…They were trying to expand but didn't have the capacity to expand; they didn't have the economies of scale to be able to make their development sustainable in a way, which is why they ran into trouble.

1st and 2nd Order Data Categories and Themes	Representative Quotations
Overarching Theme: Streamlining of Administrative Routines	
1.Integration/Absorption	
A. Centralization	A. 1. It worked on all levels in that way; I mean a far more efficient body now the new art college … like cleaning, you know, it had been incredibly expensive to clean a college like this. Now, you are buying into the university's kind of cleaning arrangements.
	A.2. We need to make sure that if our perception of the way that we need to work is as the same as the perception of the [individual] school[s] we've got and we keep an eye on what the schools are doing as much as they keep an eye on what we are doing and we link together very closely.
	A.3. And there are still across the university unique cultures that survive within a larger umbrella. I think the university is quite good at doing that. So the divinity college feels like a divinity college. The new VETS feels like a veterinary hospital. What connects them is an issue of brand and sort of management structures and the Ethos of the university around excellent quality.
B. Specialization	B.1. They used to have a broad range of applicable capabilities and broad range of things to do. Now, they come into a bigger, incomparable organization with what they used to. Now instead of doing so many things, they are more focused. So instead of pushing them to the edge of their capabilities, they have been limited, or delimited, to a core of their capability that sometimes is not their favorable core.
	B.2. The heads of school in the old art college… would be doing everything at every level. I always laughed and said that 'we were even ordering the milk'. Because in a way, a small institution, you got the same hurdles to jump over as the university as far as quality, as far as HR, as far as all of these kinds of services. But we were small, so we're almost kind of replicating things; at similar level of quality, but we were too small to do that. So, I think these kinds of economies of scale are very important.
	B.3. I was more involved at strategic level at the art college. That has become more operational now [in the university]. In the art college, I dealt more with senior management and the executive of the college, taking an overall approach, if you like to HR. Many of the small or individual problems would be taken on by the staff in the HR team. Here, I've become part of that team! So I'm dealing with the day-to-day problems.
C. Standardization	C.1. What we wanted to do in those few weeks was to get a real sense of, for each of those art college heads of school, something that they could interacts with, interrogate, discuss as second nature. Because certainly seemed that the two schools within independent ECA had even not seen a budget before! They did not.
	C.2. I think the thing they found particularly difficult, apart from just having to cope with different practices, is their feelings in every case that their previous practices are being seen as having been wrong, or deficient, rather than just different … I think they feel they had an institution-wide perspective, even that was tiny, and their skills are being seen as less valid.
	C.3. whether you are very conscious of it or not, there is this kind of tacit acknowledgement around the place. Everyone was trying not to talk about it but the management of the art college was a shambles. And you are trying to say, 'your own skills are great, and we will bring them in and we can do things with them and they are lovely but they are different'. But no matter what people were saying, I think everybody is aware that underneath it was thinking but it was a shambles.
	C.4. No maintenance [in the art college]; changing light bulbs nothing else! … health and safety practices that all were out of date or just non-existent. …budget, staffing, student records are areas that I think were just completely inadequately managed. And those are the core things of running any institution.
D. Need for continuity of university's	D.1. I think a lot of the merger depends on not too much fresh air and newness. I think of the things you have to … the sort of language being used is more about continuity, continuing good practices (of university).

1st and 2nd Order Data Categories and Themes	Representative Quotations
practices	D.2. We tell the new art college how they need to adapt their old processes and adopt our processes…overarching all of that is training, linking together and making sure that people can understand how to do their business when it's a new business, a business that we have been involved in for some time so that we can say 'we can help you'.
	D.3. They [art college] got more dependent on individual people. But you cannot do that within an institution like the university. There have to be a set of things that is the norm, policies that are the norm, and you can deviate from, you can respond quickly if something crops up. But it is very knowingly done as a deviation from the norm.

2. Assimilation/Absorption

E. Acculturation within the areas of expertise	E.1.Everything was at really kind of individual levels…if something cropped up and needed changing, someone would have gone to the old principal, to the old secretary, to the old somebody in management and said: 'oh we have got a problem; someone is being very difficult, this professor wants to do such and such'. And there would always be a kind of exception made, or a one-off bespoke model created for that issue whether it was a difficult professor, or changing the equipment of something that had broken down, anything, it was kind of a deal with one-off bases.
	E.2. [In the university] we get involved in the matriculation side, the nurturing side, the on-program side, where our role is again to keep a light touch on the quality assurance oversight of what our schools are doing, but also have the control of certain things where we need to make sure that due processes happened.
	E.3. The operational side, the support staff, the administration of the new art college, that's where the biggest stress has been, because […] people had to make a huge leap into new systems. And I am finding that's where staff are most concerned about adapting to new systems.
F. Acculturation across the lines of expertise	F.1. The head of the business school, with the head of divinity, the head of history, the head of the LLC, the head of the art college, the head of education, …., on one level, we all talk with different languages even within the same college; but on the other level, there is a sort of understanding of the jargon, the kind of management speak we have to engage with internally and in the kind of national debates in higher education. That common language exists.
	F.2. We need to ensure that the new college is well embedded and integrated with the university and that five disciplines […] speak together and make a kind of cohesive unit, engage with all the university has to offer, become full part of the university as a new department and so exploit those opportunities.
	F.3. It is a complete change in the mindset from the sort of management culture and structure that existed in the old art college to a more entrepreneurial, outward looking, engaged culture that is possible with the sort of financial and planning structures that are available in the university.

Overarching Theme: Conservation of Academic Practices

3. Replication and Articulation/Preservation

G. Unique academic culture of art college	G1. The university does tend to do that quite generically, which I know causes some problems for other parts of the university, that they are not hitting the right sort of markets, they are not speaking to the potential applicants, in the right sort of language. And that is one of the very distinctive elements of an art college, of an art and design college, that people come from different sorts of foundation courses, into the university with all sort of qualifications that don't necessarily fit the university's criteria.
	G.2. Even within the new art college, the school of music has its own culture (and as a result, its own practices), and the sort of people involved … Art historians, they have a very particular kind of culture, and even within the old art college, there were many different

1st and 2nd Order Data Categories and Themes	Representative Quotations
	cultures, graphic designers, film makers were completely different than sculptors. So, I think people may be cling on to this sense of uniqueness.
H. Good academic capabilities	H.1. Academic skills (in the art college) are great, and we will bring them in and we can do things with them and they are lovely though they are different.
	H.2. On the other hand, the day to day teaching very good, and some people's research, very good. So there was like some aspects of it were really great. It was the management side that seemed to be such a disaster.
	H. 3. Because the student are great, the staff are really great at doing the academic side of what they do, the technical practical academic stuff, whether it is teaching or research, is really very good quality.
I. Complementary knowledge	I.1. The interesting thing was that they were interestingly different from us. So, if you go to the design school in the art college, they are not doing anything like the sort of things that we do in Informatics and they don't think the same way, they are very different and interesting in a complementary way!
	I.2. "Experimentation and failure" is at the heart of an art college; the permission for failure. And the point about coming here was to bump into new practices in the university, to experiment, to test the limits of your artistic imagination, and to fail.
J. Little intervention from the governing body	J.1. Most academics do not have [a] clue what institution they are in; their mind is in their discipline. And that's what they're bobbed about. OK if an institution comes along tells them to do things differently, they moan about it, and then probably they do it eventually a bit.
	J.2. The university is basically quite a light touch institution. And lots of people on the ground, lots of academics on the ground, actually just do their thing. There is not a huge army of bureaucracy behind it. There are policies but they are quite light touch. And there is a lot of tolerance of devolution and different approaches… The academics and students [from the art college] have not had to make the changes as they feared. They haven't had that kind of cultural backlash.

4. Combination/Symbiosis

1st and 2nd Order Data Categories and Themes	Representative Quotations
K. Interdisciplinary tradition in the university	K.1. A moderately good example of that is what happened in the CHCR [a pseudonym] around the map task corpus, because that was a resource, a big resource, about people communicating about a collaborative task. There are lots different layers you can analyze that which is actually stretch from pure psychology to pure phonetics to semantics to could you build a computer that could play this task. So, all kind of different problems could be thought about around this resource. And building that resource required people to understand each other to the point that they can actually seem that they were building the same thing but then they will be taking a different perspective on that same thing.
	K2. In a bigger institution like the university you bump into different disciplines easier. For people who work at the edge of their field, actually quite close to other areas, the university makes it easier for them to move and cross the boundaries by making them connected. Indeed they're now one body
	K.3. Interdisciplinary connections are important both within the college and in terms of relating to the departments outside the university. So developing really close relationships with informatics for example, or building film as an area across the university … so making these connections that make us better within the university than what we would have been if we have been a small independent institution.
	K.4. One of the things that I think was important in the early stages was, both the Heads of Design and Informatics were quite keen on it. Then … we had various meetings and little workshops just to see whether the culture will work. If no one would have turned up for these meetings, we would have known that it wouldn't have worked and we would just have shrugged and say: 'well no, we can't really do this, because nobody is really interested'. But the reverse was true. We got quite a lot of people turning up. At that time, that was all being done without any money. There was going to be a merger and we were just interested in doing this.

1st and 2nd Order Data Categories and Themes	Representative Quotations
L. Managerial support	L.1. It's my job in a way to get the designers to the table and make sure that the engineers and the scientists don't think, well, it's not worth getting them to the table because we have to go backwards so many steps to try and explain to them the technology that it's not worth it. So, it's to try equipping the designers and the scientists to understand each other's vocabularies and new answers of vocabularies; so they can actually talk together.

L.2. The Principal has a background in informatics and he is interested in design. So he was quite keen for his own kind of reasons to push that idea, I think. He was certainly the strongest support of the move to trying to get money for the design and informatics center as a concept ... there was money which effectively was made available by the Principal.

L.3. ...there was the idea of creating a center for design and informatics which would be a more substantial thing that would get funding from the Government Funding Council somehow, and would be a kind of flagship to foster research but also teaching between design and informatics. |
| M. Needle-shaped academics | M.1. We didn't have very many of the people who applied who were genuinely across these things. And to the extent that we did, there was really one person who some of his stuff was more or less doing that. But from the point of view of Informatics, he looked rather technically week.

M.2. The idea was that we would hire a lecturer in informatics and design; he [sic] would be facilitating the design and informatics thing, the joint program. So they had this kind of recruitment exercise to recruit people for this. But it became evident to me... that most of the people in informatics really saw this is a possibility to get someone who is in their area. They could make the case that this person had something to do with design but what they really wanted was just a person in their area. ... I think it was inevitable that there would be limited support within informatics for really getting involved with designers and really trying to understand what designers were doing and how you could work with them.

M3. Academic performance, in general, definitely arrowed the narrow specialists! There can be no doubt about that; from the publications' point of view, publishing in a narrow field is much more likely to have an impact than publishing in a broad field. |
| N. Obstacles to interdisciplinary work | N. 1. This is the advice I typically end up giving to PhD student: if you want to get a job in academia you've got to identify for your PhD which is the primary subject that you want your PhD to be visible to, because this is a very unusual academic department that has the luxury for interdisciplinarians.

N.2. I'm painting with a broad brush here, but something I found being in cognitive science is that you are kind of spoiled for choices to where you publish. Because if you are doing a piece of research let's say about human reasoning and semantics, do you publish this in a logic journal, or psychology journal, or language journal, or in cognitive science? Well yes you can, but actually for a long time interesting enough cognitive science journals in terms of impact had allegedly lower impact compared with much narrower journals.

N.3. I think that the [shared] language comes from the graduates, not from the [academic] staff ... Because the staff come from a deep expertise, there are very few people who have this kind of hybrid thing, and all you can do with staff is to have them give deep expertise, create a kind of structure which will allow new graduates to be the hybrid. |

As a result of the difficulties that the art college was facing (including the financial ones), its administrative practices were almost all perceived as 'bad practice' that should be terminated. Although endeavoring to maintain good personal relations to their new colleagues, the attitudes of the university administration staff were reminiscent of the so-called 'conquering army syndrome' (Datta and Grant, 1990). A manager from the university mentioned in an interview that:

> The art college was being run so badly that we can't let those practices come in here, but we're trying not to say that, because at the personal level we were trying to be respectful

of individual skills. 'There is nothing wrong with you, but the way you've been told to do things for the last ten years were so bad and you can't do it like that anymore.' But we're not going to say that because that is a bit embarrassing.

Because of the financial difficulties of the art college, the larger size of the university and the need to gain scale economies through standardization, the integration strategy pursued in administration was one of *assimilation* (Haspeslagh and Jemison, 1991, p.145), where the university's systems and procedures were imposed with little or no adaptation. As a manager in the old art college said in a meeting:

> I think when you look at the size of the university and the size of the college, comparably they're miles apart. The college really has 300 staff, here you have 10,000. So if there are things that we've done well and there were some that we've done better than the university … but the point I'm trying to make is that it is easier for 300 people to change to the ways of 10,000 than if it is for 10,000 to change to the ways of 300.

For the administrative staff of the art college, the merger led to a redefinition of work tasks that tended to become narrower and less interesting. An HR manager from the college explained to us that:

> I think that perhaps depends where they work. …registry staff where very disappointed to be moving into very defined roles where in the college they had a broader remit. More of the same for what happened in other areas such as HR…I am going from being a free range hen to a battery hen. You had the run of the place but all of the sudden then you are in this very small defined area and that's all you are going to do from then on!

As a result, differences in organizational culture, a long recognized obstacle to successful post-merger integration, were big enough to create a 'culture chock' for administrators moving from the art college to the university (see data categories E and F). As a high-level manager from the college explained to us:

> We had a village mentality. The college was like living in a village; everybody knew everybody, and all of a sudden, we were moving to a metropolis; just massive, you don't know anybody! And I think that's a huge culture change.

The organizational culture of the art college is described as being along 'traditional, academic' lines, with a 'results orientation', emphasizing research and teaching with little regard for economic efficiency, systems and procedures. The university, in contrast, had developed a culture of 'public management' (Ferlie, Ashburner, FitzGerald, and Pettigrew, 1996), a 'process orientation' emphasizing efficiency, accountability and quality control. As a head of administration from the university mentioned in the interview:

> …there is a very, very clear understanding of the norm… I think that's the biggest contrast for what I can see; [in the art college] there was less shared understanding of the normal, correct procedures. It doesn't sound as if there were normal processes and practices for things! You always have to have deviations from the normal; you are always going to have someone very difficult. But there was not that sense of saying: 'look this is the normal run of business and every one may get a deviation'. It was like everything was a deviation!

Following the merger, the non-academic staff from the art college was required to manage according to defined university procedures. In this regard, the computerized management information system served as a pervasive 'boundary object', linking the various communities of the university. As one manager in the university registry described:

> We have many academic members of staff who are coming in to see our STUDSYS (a pseudonym) student system for the first time and it is very daunting. They have been used to a system which was partly electronic, partly paper. Coming to a system which is mainly electronic and completely different… and as we know, it's not totally intuitive the way it works, and there has been no training set up.

As a result, the university has developed an 'umbrella mind-set' including a set of common codes that helped to ensure administrative cohesion across disciplines and epistemic communities. Being unfamiliar with the terminology, the acquisition of this common understanding presented an initial hurdle for the art college staff. This was pointed out by a high level manager in the university describing a meeting with their counterparts:

> We sat at one meeting, for instance, just with the year budget to talk about. 'What would be the assumptions for going through the budget? What does each of the headings mean? What room for maneuver have we got?' The terminology is difficult! … Because it certainly seemed that the two schools within independent art college had not seen a budget before! …And they were like 'could we vary that? Could we move that?'…there were lots of very, very basic explaining and answering questions.

The Academic Merger

Teaching and research were generally not strongly affected by the merger, as these activities were undertaken in discipline-based departments with quite distinct characteristics (see data categories G, H, I and J). The quality of teaching and research in both institutions was generally recognized to be at a high level and, in line with the autonomy traditionally afforded individual disciplines in the university, the prevailing integration strategy was one of *preservation* (Haspeslagh and Jemison, 1991). A head of college in university, who was also a convener of one of the integration working groups explained:

> Definitely the quality of students' work and therefore of the teaching, and the quality of the research, where research was happening – because research was not necessarily happening across the board [in the art college] – were all fine. There is no question they're very strong. And there is this kernel of [academic] staff that was very strong and remains very strong. That's what's going to make the thing work.

For the most part, therefore, the merger involved few, if any, changes to on-going knowledge processes of replication and articulation. The art college's academic staff continued teaching and engaging in master-apprentice relationships, passing on the skills of their respective communities to their students (replication), and those engaging in research (articulation) carried on without much disruption. However, in a few areas a more *symbiotic* integration approach (Haspeslagh and Jemison, 1991, p.145) was

pursued with the explicit aim to achieve synergies through innovative combinations of knowledge across disciplines (see data categories K, L, M and N). Foremost among these was the attempt to combine design (from the art college) with informatics (from the university) – an endeavor that became something of 'flagship' project. In mobilizing political backing for the merger, the benefits of such a combination were early on highlighted by top management, who also provided financial support. As an academic staff engaged in joint research center described:

> The merger was obviously a large political exercise and was certainly pushed strongly by the Principal of the university and the head of the art college at that time. And in the document that they originally wrote to explain why it would make sense to have this merger, the idea of design and informatics collaborating was actually pushed quite hard.

The combination of design and informatics into a new center was also seen as a way to attract external funding, partly because the combination of design and informatics was 'in the air' at the time. This was explained to us by one of the co-head of the joint research center:

> It was also timely, because at the same time that the merger was going on, you have to look at the broader picture and the broader picture was quite a lot of interest in things like digital media and so on in the UK and internationally.

In addition to the supporting institutional, political and economic factors, the setting up of the new inter-disciplinary center was facilitated by a history of collaboration between individuals in informatics and in the art college and by the active support of the heads of school affected, providing both executive support and taking on the roles of project champions. As a head of school from the university explained:

> We had a lecturer… who is half and half, half in architecture and half in informatics. He got involved with the design and informatics actively… And then, there are people inside architecture who were very well acquainted with informatics ideas. So that was all very handy, because those guys had already made bridges.

In spite of these favorable conditions, the attempt to create an inter-disciplinary, innovative combination of design and informatics in both teaching and research, actual results did not meet initial expectations. As one of the heads of joint research programs explained to us in a meeting, the long-range initiative lost its momentum after the merger:

> So, we thought we would have this research program [design and informatics] which I kind of agreed to try to get working. And it worked for a while and there were keys which are still there. And we had some meetings and discussed various things. And it was quite good, but it sort of petered out off after a while as these things often do. It became more and more difficult to get people to come to the meetings and we ended up with quite small groups discussing things. That's still interesting but it is just difficult to keep the momentum going really. So as a [joint] research program, that kind of faded out to a large extent.

A range of factors and circumstances conspired to thwart the initiative. Foremost of these were the nature of career patterns and reward systems that failed to provide the

incentives for individuals to engage in interdisciplinary cooperation and the investments necessary to overcome the cognitive barriers separating epistemic communities. In fact, institutional pressures and governance systems at times created clearly negative incentives to do so. This was well explained by one of our informants engaged in multidisciplinary work:

> There are only a few mechanisms that the university has for incentivizing people. You know you can't pay them any extra! It is very hard even to give them more time or less other responsibilities. I mean you can to some extent, but it is very difficult. Because everything is so autonomous and devolved! Within the school, people may or may not agree to shift workloads around to create some kind of space for creating a new program. But if one person is going to do less work, it means everyone else is going to have to do some more of that and they are not necessarily very keen on that. And the system is usually democratic enough that is very hard to get them all to agree.

The most clearly negative incentives came from the university career system, in which promotions and salaries were largely based on the REF, with an emphasis on publications in top tier disciplinary journals. As an informant engaged in multidisciplinary work from the informatics explained:

> People have their own research interests and they want to push their own research interests. …there is no point in trying to get people to do something they don't really want to do. They won't produce lots of publications that way! Informatics, like many other parts of the university, is very much driven by things like the REF…So they want to get more research publications. Well if you can convince them that creating a new collaboration is going to generate more and better publications than they are already generating then that could attract them. But otherwise why should they be interested?

A few years into the process, the initial objectives for a creative synthesis combining design and informatics have been revised downwards, with some staff members resigned to the hope that students exposed to both disciplines will be better positioned to bridge the two disciplines. This was explained to us by one the co-heads of design and informatics center:

> Very often their [the designers'] understanding of anything in informatics is somehow kind of superficial in the same way there is a superficial level of understanding of design in informatics. So actually getting these things to meet at a deeper level is quite difficult and is going to get quite a lot of time and will probably really happen only through the students if it happens at all… Most of the academics are already too entrenched in what they do. But if you can get students to come together that's where there is the possibility.

DISCUSSION

The Merger Process

Following the merger, the administrative systems and procedures of the larger university were imposed on the art college with little or no appreciation of the potential value of the latter's capabilities (see second-order themes, Integration and Assimilation). The process parallels the forced cultural assimilation associated with an integration strategy of absorption, as frequently observed in business mergers. Since

inherited work practices form an important element of organizational culture and employees' sense of identity, the integration process was clearly perceived as painful by the art college's administrative employees and, as is frequently observed, many decided to seek other employment.

In contrast, for most of the academic personnel, the merger was perceived to entail only marginal changes. Although expectations on research output increased somewhat, most of the art college's academic staff could continue their work largely as before (see second-order theme, Replication and Articulation). The integration subsequent to the merger, or rather the lack thereof, was similar to that often observed in conglomerate business mergers, where there is little scope for synergetic gains and where a preservation integration strategy is matched by the employees' general desire to maintain their autonomy and identity. The parallel is enlightening, as it highlights the fact that – as reflected in their organization into faculties and discipline-based departments – universities are typically composed of largely autonomous epistemic groupings with little overlap or mutual interdependence.

These characteristics of universities reflect the present stage of their historical evolution, in which they are often assigned rather vague and broad societal missions and where the ideal of autonomous scholarship is still an influential tradition (Martin, 2012). An important aspect of this tradition is the prevailing practice of evaluating academic institutions by their research output, primarily in terms of publications in peer-reviewed journals. In inevitable consequence, this practice permeates the career and reward systems in universities, shaping the incentive structures facing individual academics. The low prestige and impact factors of the few inter-disciplinary journals available, the difficulty of finding reviewers capable of appreciating interdisciplinary research and the personal investments necessary to acquire sufficient mastery of another field make such endeavors exceedingly unattractive (see second-order theme, Combination).

The most evident indication of the university's problems in sustaining interdisciplinary research is the failed attempt (at least in short-term) to establish a center combining design and informatics. In spite of extremely favorable conditions, including top management support, dedicated project champions and government funding, the initiative appears to have petered out after an initial flurry of enthusiasm, as – on second thought – prospective participants more carefully weighed the required investment in new learning against rather uncertain potential benefits.

This institutional framework is in stark contrast to that of firms. In business firms, the yardsticks applied in performance evaluations of employees tend to be largely internal, aimed to measure the individual's contributions to agreed-upon *organizational* goals. Since the prestige and recognition enjoyed in professional peer groups outside the firm are generally less important, individuals are generally more prepared to undertake the learning necessary to effectively collaborate with colleagues with other epistemic backgrounds, thereby facilitating not only the integration and coordination of

day-to-day tasks, but also the pursuit of innovatory combinations of knowledge emanating in different epistemic environments.

Under the institutional conditions currently shaping their incentive structures, universities appear clearly inferior to firms in promoting innovation through inter-disciplinary combinations of knowledge. Their major relative advantage vis-à-vis firms seems to be in the governance of knowledge processes involving the transfer of tacit knowledge in master-apprentice type of relationships, often too time consuming and expensive for profit oriented firms in competitive environments. Universities may also have a relative advantage in knowledge creation through articulation, given that their reward and career systems so clearly favor the explication and dissemination of codified, intra-disciplinary knowledge.

Theoretical Implications

In the present context, post-merger integration offers a valuable opportunity to study the factors that facilitate or block the formation of 'higher-order organizational principles', and hence the kind of 'social communities of voluntaristic action' invoked by Kogut and Zander (1992). Doing so in the context of a university merger offers the possibility to compare these factors to those that have been observed in the large literature of post-merger integration in business firms. As reported above, some of the findings of our study parallel processes observed in firms, others differ in theoretically significant ways that help provide a slightly new perspective to knowledge-based theory.

The so-called 'the knowledge-based view' of the firm is positioned as an alternative or, in some renderings, complementary perspective to the dominant transaction cost based theory of the firm associated with the works of Ronald Coase (1937) and Oliver Williamson (1975, 1985). Its focus is on the relative advantage of firms ('hierarchy') over markets in the governance of knowledge-intensive transactions. Figure 4 offers a stylized summary of some key contributions.

In line with Richard Nelson and Sidney Winter's (1982) seminal exposition, one line of argument focuses on *replication* of capabilities as a key feature of firm growth. When the knowledge informing capabilities is well-articulated, it can be passed on to third parties at low cost and exploited through licensing; when the knowledge in question is 'tacit' and poorly articulated, transfer to outside parties is difficult and costly. However, firms – as "social communities of voluntaristic action" – are in a privileged position to pass on and exploit internally also unarticulated, experiential knowledge. This favors organic, intra-firm expansion, irrespective of potential transactional hazards due to the threat of opportunism on the part of contracting agents (Kogut and Zander, 1992; Zollo and Winter, 2002).

Figure 4: Knowledge Process Governance in the 'Knowledge Based View' of the Firm

	Knowledge characteristics	Exploitation of existing capabilities	Creation of new capabilities
Within epistemic communities	Experiential/ poorly articulated	**Replication** *Firm* *(growth)* Kogut & Zander 1993 Zollo & Winter 2002	**Articulation**
	Well articulated/ codified	*Market* *(licensing)*	
Between epistemic communities	Ambiguous and shifting interfaces	**Integration** *Firm* *(coordination/control)* Grant 1996a, 1996b	**Combination** *Firm* *(innovation)* Kogut & Zander 1992 Nahapiet & Ghoshal 1998
	Well defined and stable interfaces	*Market* *(outsourcing)*	

A second line of argument emphasizes the boundary-spanning ability of firms to unite and coordinate the activities and interaction of professionals with different epistemic backgrounds. This provides advantages not only in terms of the day-to-day *integration* and coordination needed to exploit existing capabilities (Grant, 1996a) but also for innovation and the creation of new capabilities through novel *combinations* of existing knowledge from different domains (Grant, 1996b; Kogut and Zander, 1992; Nahapiet and Ghoshal, 1998). Although the distinction between 'tacit' and 'codified' knowledge is central to much of the argument, the knowledge based view is surprisingly silent as to the role of *articulation*, the explication of experiential skills and knowledge into standardized and easily replicable form[3].

The strongest arguments advanced in the literature expounding the relative advantage of firms over markets refer to the ability of the former to enable and encourage cooperation and coordination among people who belong to different epistemic communities and have different professional and functional expertise. Hierarchical governance is superior to arm's length contracting both in facilitating innovatory combinations of knowledge and integrating the knowledge of different

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[3] Citing Teece (1977), Kogut and Zander (1993, p.630) note that due to increased efforts of codification, the costs of transferring knowledge decline with the number of transfers undertaken. However, their subsequent discussion and empirical analyses ignore the role of articulation and codification; the manufacturing technologies in their sample are classified according to their intrinsic 'codifiability', a characteristic implicitly assumed to be stable over several decades. As elsewhere in the literature, the difference between tacit and explicit knowledge is central, but the role of articulation and codification in altering the properties of knowledge does not enter the argument.

epistemic communities, especially when the interfaces between knowledge elements are ambiguous or shifting.

In contrast, the governance systems of universities have to a significant extent evolved in response to the characteristics of intra-disciplinary knowledge processes within epistemic communities (Figure 5). These include both articulation – the explication of new knowledge through research – and replication – the teaching and learning of the creative capabilities needed to conceive of and carry out such research. Being difficult or impossible to articulate, the passing on of such capabilities can only take place in master-apprentice type relationships requiring very specific institutional regulations. Also in contrast to firms, universities also specialize in the replication through publication and other modes of dissemination of codified knowledge, the outcome of research. Partly, of course, this is associated with the societal mission to produce and disseminate useful knowledge the value of which is difficult to appropriate in the market.

Figure 5: Knowledge Process Governance – An Extension

Knowledge characteristics	Exploitation of existing capabilities		Creation of new capabilities
	Replication		**Articulation**
Experiential/ poorly articulated	*Firm* (growth)	*University* (tutoring, supervision)	*University* (research)
Well articulated/ codified	*Market* (licensing)	*University* (teaching, publishing)	
	Integration		**Combination**
Ambiguous and shifting interfaces	*Firm* (coordination/control)	*University*	*Firm* (innovation)
Well defined and stable interfaces	*Market* (outsourcing)		

(Within epistemic communities spans the Experiential and Well articulated rows; Between epistemic communities spans the Ambiguous and Well defined rows.)

According to the knowledge based view, the ability to integrate and combine knowledge elements from different areas of expertise is a prime characteristic of business firms, maybe their very *raison d'être*. Now, why are interdisciplinary combinations of competences so difficult to achieve in academic teaching and research? The key difference in governance systems does not seem to be, as Kogut and Zander (1996) maintain, in the employment relation *per se,* nor is it clear why Foss's (1996a) argument regarding the alleviation of moral hazard through hierarchical governance would not apply equally to universities as to firms.

The observed differences in the knowledge processes in universities and firms point to more fundamental differences in their governance structures than can be ascribed only to overt incentive structures and other '*surface regulations*' that govern the day-to-day operations of rules, routines and daily practices. The differences seem to reflect fundamental and contrasting characteristics in '*deep structure*' or '*habitus*', the partially tacit understanding of the principles that give meaning and cohesion to organizational practice through meta-rules that provide the premises for decisions and actions, thereby overarching and shaping daily routines and their outcomes (Bourdieu, 1990; Nelson and Winter, 1982; Nooteboom, 2008; Simon, 1976). These fundamental differences are results of the historical evolution of the missions and institutional characteristics of firms and universities, the legacy of which profoundly shapes their deep structures and habitus, especially through the way it affects the 'meaning' and 'identity' associated with being in their employ.

The salient characteristics of the relevant interrelationships can be described in terms of ideal type configurations of knowledge governance configurations (Weber, 1949). In line with the empirical findings, we distinguish between the administrative and the academic aspects of university work, where the former bears strong resemblance to other forms of public service (Table III).

Table III: Archetypes of Knowledge Governance Configurations in Firms and Universities

Organizing principles	Firms	Universities	
		Administration	Academic work
		(public service)	(teaching-research)
Governance characteristics			
Mission/objectives	Private profit	Public value	Public value
Mode of control	Hierarchical	Hierarchical	Collegial
Epistemic interdependence	High	Medium	Low
Knowledge legitimation	Market acceptance	External audit	Peer review
Primary identity	Firm	Agency/profession	Academic discipline
Organization specific knowledge	Very important	Important	Unimportant
Workforce mobility	Low	Medium	High

Governance characteristics. For the purposes of the present argument, we limit the differentiation of basic governance characteristics to the overall *mission and objectives* and the dominating *mode of control*. In contrast to business firms, whose general goal is the generation of private profit, the archetypical mission of universities is to generate public value through education and new knowledge generation. In both firm and public service organizations, including university administration, organizational structures and control systems can be characterized as 'hierarchical'. Academic work, in contrast, has traditionally employed more collegial forms of governance, with universities principally governed by their academic staff (Lapworth, 2004; Trakman, 2008), a model well aligned with the nature of the knowledge processes in which they engage.

In recent decades, this model has come under pressure from politicians and government bodies, seeking to ensure accountability, efficiency and relevance through the introduction of modern 'public management' principles, at least in part emulating those prevailing in private business firms (Taylor, 2013). The objective of the 'ideal type' outlined here is to provide a theoretical perspective by which the introduction of 'corporate' or 'managerial' forms of governance can be analyzed; it does not represent 'typical' or 'average' governance patterns in present day universities.

Epistemic interdependence. Since medieval times, academic work in universities has predominantly been organized in faculties and according to disciplines, and this seems to be one of their defining characteristics[4]. In contrast to firms and public service organizations (including university administration), where goal attainment requires coordination and integration of diverse capabilities, research and teaching in universities are largely intra-disciplinary. Interaction with other epistemic communities – such as those in other disciplines or administrative functions – is usually routinized and can be carried out through well-defined interfaces.

Knowledge legitimization. A key difference between the three governance structures is the mode of validating the value and relevance of newly developed knowledge and applied capabilities. In business firms, market acceptance and profits provide comparatively clear and unambiguous indicators. The quality and value of academic research are much harder to gauge. Peer endorsement, as evidenced in citations and general recognition, for example, is generally a key factor; evaluation of performance is internal to the epistemic community of the discipline. For university administration and other public service organizations, performance criteria are typically enforced by external agents, politicians and government bureaucrats attempting to ensure that services are rendered according to 'best practice'.

Identity. The training of academics, much of which involves the passing on of uncodified (and perhaps uncodifiable) knowledge in master-apprentice type relationships, bears

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[4] The roles of universities have varied over time and between countries, reflecting differences in the 'social contract' defining their expected relative emphasis on research, teaching and other more tangible contributions to society, such as engagement with local industry (Martin, 2012). Generalizations should therefore be made with caution.

strong resemblances to the learning processes described by Lave and Wenger (1991) as 'legitimate peripheral participation'. Like in the situations analyzed by Lave and Wenger, these processes involve more than the mere acquisition of skills. As summarized by Nicolini (2012, p.84):

> ...novices do not just acquire the necessary knowledge to perform the activity, but also absorb a moral way of being; that is, a model of excellence specific to that practice that determines at one an ethic, a set of values, and the sense of virtues associated with the achievement of the high standard of conduct implicit in the practice. ... A novice who cheats, who is unwilling to embrace the goods and try, at least to some extent, to achieve them, will simply not become part of that practice.

The moral imperatives and the sense of identity associated with membership in a particular epistemic community obtain special significance in universities since oftentimes a period of apprenticeship as a junior academic (e.g., a doctoral student or a research fellow) is followed directly by an academic career within the same discipline. For most academics, therefore, primary allegiance and identity stays with the discipline that sets standards and provides peer reference. Engagement with colleagues from other disciplines is typically limited, as is often the identification with the university itself. In the terminology suggested by Wenger (1998, p.127), universities can best be described as *'constellations of practices'*, interconnected primarily through their "belonging to an institution", but also by, for example, "having geographical relations of proximity or interaction", "having overlapping styles or discourses" and "competing for the same resources".

Employee recruitment in business firms and public service organizations (including university administration) differs from that of universities in that new employees are hired with the explicit purpose of working together towards a common aim, regardless of their epistemic backgrounds and prior experience. Organizational goals can only be achieved through integration and combination of diverse competences. This requires investments – on part of both employers and employees – in the creation of common understandings, common codes and supporting infrastructure, which – if successful – may establish the firm itself as an epistemic community in its own right (Håkanson, 2010)[5]. On entering the employment of a business firm or university administration, newcomers obtain – whether they like it or not – a significant *new* epistemic identity, next to or superseding that of their professional training or prior employment.

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[5] Wenger (1998) expressly denies the possibility that a community as large and diverse as a firm could qualify as a 'community of practice' – a concept that he prefers to reserve for more localized and cohesive groups. However, the criteria he lists for the identification of communities of practice read as a description of firms, as understood in the knowledge based view. By adopting, as we do here, Holzner's (1968) term 'epistemic communities', which does not have this more narrow connotation, we reserve in line with Wenger (1998) and Lave and Wenger (1991) 'communities of practice' for work groups whose members engage in frequent and intensive interaction.

Workforce mobility. Through the acquisition the knowledge and skills of a firm-specific epistemic community, employees in firms, and to some extent also in public service organizations, obtain capabilities of greater value inside the firm (organization) than elsewhere. This reduces the likelihood that employees are bid away by other employers, thereby decreasing the mobility of the workforce. In contrast, intra-disciplinary academic teaching and research are largely independent of the particular organizational setting in which they take place. Like other professionals working within the realm of their own epistemic communities – lawyers, architects or medical doctors, for example – the productivity and 'market value' of academics are largely independent of their organizational context. Like in professional service firms, the resulting mobility is a key factor in an individual's bargaining power vis-à-vis her employer not only for financial rewards but also for autonomy and lack of restrictions from external constraints, the latter a key characteristic of her professional identity.

Managerial Implications

The issues raised in this article are not only of great theoretical interest, but they have considerable empirical and managerial relevance. In the face of increasing global competition, cost pressures and demands to increase research output and services to students, a wave of mergers have affected the university sectors in the States, Canada, the UK and many other countries in Europe (Eastman and Lang, 2001; Lang, 2002). These pressures have affected the organizational systems, managerial practices and organizational cultures of individual universities and colleges to different degrees. As extant literature proposes, while some institutions have moved to become 'professionalized managerial systems', others have retained a more scholarly, collegial approach (Clark, 1998; Mosey et al, 2012; Deiaco, Hughes and Kitson, 2012).

The importation of managerial practices from business firms into the very different epistemic environment of academia have had some familiar consequences, such as the tendency to focus on performance indicators (number of articles in specified prestigious journals) rather than on actual performance (quality, novelty or usefulness of new ideas), leading to an emphasis on orthodox, methodology-driven and consensus-seeking research (Macdonald and Kam, 2007; 2010).

> Research must look right and feel familiar, especially as reluctant reviewers, overburdened editors (or even administrative assistants) have little option but to judge most submissions by appearances rather than content. The vast majority of papers will not feel right and will be summarily returned, this being the only way to sustain high rejection rates (Macdonald and Kam, 2007, p.708)

An inadvertent consequence of the introduction of these practices and incentive systems into academia has been the strengthening of its disciplinary focus. Effective managerial intervention in the practice of academic teaching and research requires a more fundamental consideration of the epistemic characteristics of academic communities and the governance structures that shape their members' identities and moral aspirations.

As the case study illustrates, knowledge processes *within* the confines of an individual epistemic community are subject to a very different logic than those taking place *across* epistemic boundaries. In the case of the former, knowledge processes are facilitated both by shared mastery of the theory, codes, and tools of a common practice and by the moral obligations associated with community membership and professional identity. In the case of the latter, both the ability and the motivation to engage in collaborative knowledge exchange need to be ensured through governance structures superseding those of individual epistemic communities. This involves not only the creation and maintenance of a common infrastructure – including, for example, shared organizational culture, common vocabulary, and boundary objects (Håkanson, 2010) – but also the provision of an incentive structure encompassing both intrinsic (identity) and extrinsic (money, prestige) rewards. The creation and maintenance of such governance configurations are a main and on-going accomplishment of the modern day business firm but they are alien to most universities as these have historically evolved.

The matching of governance structures with knowledge processes requires a holistic perspective. For inter-disciplinary research to flourish, new institutional frameworks need to be devised, in many ways radically different from those not prevailing in most universities. Conversely, the need for such matching suggests that the importation of managerial practices suitable for business firms and public service organizations into the largely disciplinary environment of universities will generally be ineffective or counterproductive.

CONCLUSION

Since its genesis, the so-called knowledge-based theory is based on the idea that firms are in a privileged position to manage knowledge-intensive processes. In line with its origin in a critique of transaction cost based explanations of the existence and boundaries of firms, this stream or research has allotted its exclusive empirical and theoretical focus on the governance properties of 'business firms' as compared to those of arms-length markets. The lack of attention to other forms of governance raises concerns regarding the validity of its claims. Applying insights from the knowledge-based theory of the firm and the literature on post-merger integration to an analysis of an academic merger, this paper has explored similarities and differences between the knowledge governance properties of firms with that of universities. It suggests that universities may be superior to firms in governing knowledge processes involving the transfer of tacit knowledge in master-apprentice type of relationships, and in knowledge creation through articulation, often too time consuming and expensive for profit oriented firms in competitive environments. Conversely, it appears that universities are relatively disadvantaged in the governance of processes involving combination of knowledge across epistemic boundaries. At the same time, universities seem often able of matching business firms in their ability to exploit existing knowledge through integration and replication at administrative level in a fairly similar fashion with business firms.

The conclusions sketched in the preceding paragraphs are, of course, tentative at most. However, we hope that the study reported in this paper has demonstrated the potential inherent in expanding the scope of research on knowledge processes beyond the institutional conditions of business firms. By comparison and contrast, analyses of knowledge-intensive activities in other types of institutional environments hold, we believe, great promise in increasing our understanding as to the unique roles and properties of different governance modes for the creation and exploitation of productive knowledge.

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