1. Introduction

Universities have always contributed to the regional development of their locations (Chatterton & Goddard, 2000), but over the past two decades, demands on higher education have been on the increase (Clark, 1998; Uyarra, 2010). The universities' regional role has become widely recognized, and the local and regional partners have come to regard higher education as an important engine of economic growth and a tool for delivering prosperity (Arbo & Benneworth, 2007; Breznitz & Feldman, 2012). Universities are expected to contribute to regional development through the "third mission" going beyond their traditional core functions (Jongbloed *et al*., 2008). Though the overall comprehension of universities' engagement activities has become 'embodied' by the rise of this third mission (Benneworth & Sanderson, 2009), the phenomenon itself has remained broadly defined (Jongbloed *et al.*, 2008). Currently, the third mission literature has focused on a rather idealistic 'one-size-fits-all' approach to university engagement in both policies and institutional responses (Benneworth *et al*., 2016b; Kitagawa *et al.,* 2016), though in reality universities have different motivations (Benneworth *et al*., 2016a) and ways to carry out third stream activities. This has created a need for further discussion on university's engagement activities beyond simplistic policy document reading of the third mission (Benneworth *et al*., 2016b), which should be embedded in the universities' core missions (Vorley & Nelles, 2009) to amplify and enlarge the scope of teaching and research (Etzkowitz, 2013).

The study seeks to contribute to the ongoing discussion about universities' engagement by providing a more context-sensitive reading on how a rural region shapes the university's third mission. There is a consensus, that globalized knowledge economy has increased the importance of universities to the places in which they are located (Breznitz & Feldman, 2012; Benneworth *et al..*, 2010), emphasising that universities and their locations shape each other. The different ways universities undertake the third mission have been partly explained by geographic factors (Kitagawa *et al..*, 2016). In the context of rural regions, universities have to deal with a diverse economic base dominated by small businesses and a lack of knowledge institutions (Charles, 2016); such regions also have less qualified human capital to build on innovative activities and support the knowledge economy (Sotarauta & Kosonen, 2003). Therefore, a rural context is not a straightforward innovation environment and may pose further challenges for universities' third stream activities. Hitherto, single case studies of universities based in rural regions tend to emphasise the importance of entrepreneurial leadership and personal commitment

(e.g. Lindeman, 2015; Oftedal & Foss, 2015), but they do not identify how exactly such less munificent context shapes universities' third mission.

As the literature has not sufficiently addressed different institutional adaptations of the third mission, the Entrepreneurial Architecture (EA) framework, conceptualised by Vorley and Nelles (2009) was employed to create a deeper understanding on the specific institutional characteristics of the third mission in entrepreneurial universities based in rural regions. The EA framework is based on five key elements, which aim to illustrate in more depth how entrepreneurial activities can be embedded into institutional structures oriented towards teaching and research. Ideally these dimensions can help to analyse and manage universities' internal mechanisms that together, when integrated with the core activities, reinforce implementation of the third mission (Vorley & Nelles, 2009, 2012; Nelles & Vorley 2010a, 2010b, 2011.) However, the EA literature has focused on universities' internal dynamics and has not assessed how external forces affect universities' engagement (Vorley & Nelles, 2012). This implies that the EA framework can provide further insights on the development of the third mission in universities, but it overlooks the impact of the context, even though the surrounding environment is one of the key factors in universities' move towards an entrepreneurial turn (Foss & Gibson, 2015).

The research question I have set for the study is *how rural context impacts on the way universities develop Entrepreneurial Architecture?* To answer this question, I will focus on a single case study of the University of Lincoln (UoL) located in the East Midlands of United Kingdom, as empirical studies can provide more insight to the complex relations and processes of how universities and partners in different regional contexts shape each other (Foss & Gibson, 2015). This qualitative study draws mainly from secondary data e.g. UoL's strategic documents and complementary research interviews with university personnel and regional authorities. First this paper concentrates on the five dimensions of the EA, which are further discussed in relation to contextual element, a rural region. Then the case of UoL provides a platform for identifying how rurality shapes these elements for finally drawing a stylised description of universities' EA in a particular context. Tentative findings suggests that in rural regions universities have to deal with increased expectations to take leadership outside of academia and establish more personal linkages with external stakeholders, which steers both the structures and strategic choices towards serving the local job market and regional priority sectors.

2. Understanding the third mission in a rural region

This section first discusses how Entrepreneurial Architecture can provide a means to conceptualise universities' entrepreneurial behaviour and provides an overview on the different elements of the EA (2.1). Then the EA framework is further elaborated to include a contextual element (2.2), which is finally discussed in relation to the predicted effects of a rural context on EA (2.3) in order to operationalise the research question, and to study the extent to which the impact of a rural region could be identified in practice.

2.1. From Entrepreneurial University to Entrepreneurial Architecture

The "entrepreneurial turn" has become part of universities' third mission integrated into teaching and research (Nelles & Vorley, 2010a, 2010b,2011; Vorley & Nelles, 2012); the expectation is that an 'entrepreneurial university' is able to embed economic and social development in their core functions, combining research, teaching and knowledge exchange so that each academic mission enhances the other (Etzkowitz 2013; Etzkowitz & Kloften, 2015). Thus, an entrepreneurial university seeks to balance a variety of external demands with institutional responses while safeguarding its academic excellence (Clark, 1998). This can be complicated because universities are increasingly expected to address regional issues, and at the same time, they are affected by agendas of different stakeholders (Stensaker & Benner, 2013; Charles *et al.*., 2014). However, universities have a limited capability to respond to external demands, especially in the traditional academic infrastructure (Clark, 1998), which draws attention to the development of institutionalised mechanisms to implement regional engagement. One approach that addresses this complex issue and provides a theoretical framework to analyse the different ways entrepreneurial universities can embed regional engagement in their organisational structures, is the "Entrepreneurial Architecture" framework conceptualised by Vorley and Nelles (2009). The EA framework is based on five interrelated dimensions: *structures, systems, leadership, strategies* and *culture* (Table 1). Building on these dimensions the framework can help to produce a wider understanding on how the university has integrated third stream activities with its core missions on an institutional level (Nelles & Vorley, 2010a, 2010b, 2011.)

In the EA framework the *structure* refers to entrepreneurial infrastructure, such as technology transfer offices, incubators, technology parks and business portals (Nelles &Vorley, 2010a, 2011), which are

the most visible expression of the university's engagement (Vorley & Nelles, 2012). However, the structures cannot be separated from the university's attitudes towards entrepreneurship (*leadership & culture*) nor from the specific features of the surrounding region (Foss & Gibson, 2015). They should also be integrated with *systems* supporting engagement activities (Vorley & Nelles, 2012), which suggests that external factors, a particular context*,* partly steers establishment of these structures.

Implementation of the third mission requires activities that reach outside of academia (Foss & Gibson, 2015): *systems,* such as university's networks of communication and configuration linkages between structures and departments (Nelles & Vorley, 2010a, 2011). The *leadership* dimension in EA refers to the qualification and orientation of key leaders towards the third mission (Nelles & Vorley, 2010a, 2011). It includes both formal and informal opinion leaders from within the university having influence in and outside of academia. The engagement is usually more associated with leaders' personal characters than institutional identity (Foss & Gibson, 2015).

Strategy reveals the institutional goals, internally determined formal incentive structures, which are elaborated in planning documents (Nelles &Vorley, 2010a, 2011). The growing diversity of partnerships (*systems)* makes universities more integrated with society, which demands more from the management (*leadership)* so that HEIs do not become overburdened by the claims of the stakeholders (Jongbloed *et al.*, 2008). Hence creating a sustainable strategy can be a concrete tool to speed up the university's entrepreneurial turn and facilitate balancing between academic goals and regional needs.

Culture reflects institutional, departmental and individual attitudes and norms towards the third-stream activities (Nelles & Vorley, 2010a, 2011), which are somewhat challenging to assess. However, Vorley and Nelles emphasize the importance of a strong entrepreneurial culture in ensuring the efficiency of other dimensions of the framework (2012). Culture is heavily interrelated with all five dimensions, but especially with *leadership, systems* and *strategy* (Foss & Gibson, 2015). Therefore, it can be assessed through these three dimensions and the overall success of the university's regional engagement.

Table 1. Five elements of Entrepreneurial Architecture, their operationalization and regional dimensions

EA Element	Operationalization	Regional dimensions
Structure	Entrepreneurial infrastructure: TTOs, incubators, tech parks, business portals	Collaboration with local knowledge institutions, working with surrounding business environment
System	Networks of communication and configuration linkages between structures and departments	Engagement and links with key regional stakeholders, institutional mechanisms to support entrepreneurial activities
Leadership	Qualification an orientation of key leaders toward the Third Mission	Leaders' formal and informal regional engagement in and outside of academia
Strategy	Institutional goals elaborated in planning documents: internally determined formal incentive structures	Strategic initiatives to respond to regional needs
Culture	Institutional, departmental and individual attitudes and norms towards the third stream: links with *leaderships, systems* and *strategy* and overall success of the implementation of the third mission	Environmental context affecting to individuals' attitudes towards entrepreneurship

Source: Own elaboration after Vorley and Nelles (2009).

2.2. Context – the missing dimension of the EA framework?

The impact of the regional and national context cannot be overlooked in the university's path towards the entrepreneurial turn (Sotarauta & Kosonen, 2003). Universities are not able to drive economic change alone as the socioeconomic conditions of the region influence its general ability to absorb knowledge. Therefore, their role in regional development is dependent on local factors such as employment opportunities, government funding, cultural and historic aspects of the region. (Breznitz & Feldman, 2012.) As previous studies state, proximity is inevitably one of the features determining whom universities engage with (OECD, 1982), but finding synergies with specific local conditions and institutional responses is problematic (Benneworth *et al.*, 2016b). Despite these potential limitations and challenges, context can be considered to be the key determinant of the speed and success of a university's entrepreneurial turn (Foss & Gibson, 2015), though a particular context alone does not determine if the university is capable of becoming entrepreneurial.

The five elements of the EA framework refer to internal dimensions of the university. They do not explicitly take into account how external context impacts on the EA. The elements are overlapping, rather loosely defined and operationalised, especially *culture,* which is strongly linked with the university's *context* (Foss & Gibson, 2015), a potential sixth element of the EA framework. If context is considered to be the leading dimension, as suggested by Foss and Gibson (2015), the organisation's internal architecture is partly built as a response to external demands.

A particular context has impact on the culture, either increasing or decreasing the motivation and need for the university's contribution to regional engagement. It also determines what kind of systems – and with whom – can be established outside of academia; the volume and quality of local stakeholders define the demand and potential success of these partnerships. This, in turn affects how university leaders respond to regional needs, build strategies and structures supporting the entrepreneurial turn. Their strategic choices may be heavily steered by the regional priorities and local job market, especially when local stakeholders are represented on the university's governing body. For example, a higher demand for local knowledge transfer may encourage development of a central controlling engagement point and thus contribute to entrepreneurial culture by engaging more academics in different projects and development programmes. So, in order to comprehend a particular university's efforts to build EA, we also have to develop an understanding of specific characters of the surrounding region, the context.

2.3. Entrepreneurial architectures in rural regions

Typically establishing entrepreneurial activities is more challenging for universities based in rural regions. They have to deal with a diverse economic base, lower skills level, geographical remoteness (Charles, 2016) and weaker entrepreneurial traditions (Foss & Ofdetal, 2015), all of which have significant impact on institutions' EA (see Table 2). The other regional key players may have a limited capacity to absorb knowledge (Breznitz & Feldman, 2012), which decreases the need for enterprise support services and narrows down the number of potential external R&D partnerships. These universities, typically being smaller branch campuses, also struggle to respond to the regional expectations often based on the capacity of full-range universities. They contribute to regional development primarily by increasing skills levels by offering local access to higher education and responding to regional educational needs. (Charles, 2016.) This implies that universities in such environment can have a stronger regional focus: for example, their strategic choices can be employer-

led and largely based on regional priority sectors. However, the local educational needs can be somewhat generic and therefore problematic to address with a limited curriculum (Charles, 2016).

Table 2. Predicted effect of rural context on EA

EA Element	Operationalization	Regional dimension	Predicted effect of rural context on EA
Structure	Entrepreneurial infrastructure: TTOs, incubators, tech parks, business portals	Collaboration with local knowledge institutions, working with surrounding business environment	Regional partners have a limited capacity to absorb knowledge which diminishes the need for knowledge transfer and establishment of business support structures
System	Networks of communication and configuration linkages between structures and departments	Engagement and links with key regional stakeholders, institutional mechanisms to support entrepreneurial activities	Less large-scale business collaboration; A little distance between academia and public sector; A small number of people have a lot of influence in different networks
Leadership	Qualification an orientation of key leaders toward the Third Mission	Leaders' formal and informal regional engagement in and outside of academia	High expectations for universities to take leadership in the absence of other regional knowledge organisations
Strategy	Institutional goals elaborated in planning documents: internally determined formal incentive structures	Strategic initiatives to respond to regional needs	A restricted capacity to address regional needs in both education and research; Employer-led strategies built on regional priorities
Culture	Institutional, departmental and individual attitudes and norms towards the third stream	Environmental context affecting to individuals' attitudes towards entrepreneurship	Less demand and opportunities to initiate entrepreneurial activities; Traditional academic culture oriented towards teaching activities to produce graduated to the local job market

Source: Own elaboration.

Universities based in rural regions are expected to invest in research fields that are beneficial to local industries, but the capacity of smaller, specialised campuses to do so is somewhat limited. Some rural campuses fail to meet both expectations; either they cannot respond the educational needs or are unable to create true collaboration with local industries. (Charles, 2016.) They also tend to create more networks in disciplines that are relevant in regional and industry needs. In some cases, this narrows down the third mission simply to supplying graduates to the local job market.

Previous case studies from Norway (Oftedal & Jakovleva, 2015; Oftedal & Foss, 2015) highlight that in such environments people are known: this narrows down the distance between academics, business leaders and public authorities. The close public-private partnerships in rural regions "get things done", but do not foster thinking outside of the box as a small group of people end up having a lot of influence (Foss & Gibson, 2015) – at the same time, a majority of university personnel are excluded from engagement activities. Taking these barriers into account, there is a need to deepen the understanding of how universities in rural regions can successfully support and implement third mission.

3. Setting the scene

3.1. Methodology

This is an exploratory study seeking to answer *how rural context impacts on the way universities develop their Entrepreneurial Architecture*. The analysis is based on the conceptual framework, discussed in the previous section, which presents the predicted effect of rurality on university's EA. The research approach is hermeneutic, aiming to create a deeper understanding on how the phenomena appears in a particular case. A single case study was chosen to explore the impact of a rurality on the university's EA, because case studies specifically emphasise understanding of the *context* (Saunders *et al.*., 2016). The University of Lincoln (UoL) based in a rural region of Lincolnshire serves as a critical case (Flyvbjerg, 2006) to obtain information on how a university can build institutional mechanisms to initiate structured engagement in a rural context. First established in 1996 as a small branch campus, UoL has expanded rapidly. It is still a rather young university that has experienced high expectations to support regional development. Thus UoL matches the characteristics of typical engaged universities, which are described to be "single, relatively large university located in peripheral regions" lagging behind the socio-economic development of core metropolitan regions (Boucher & *et al.*, 2003, p. 985).

The EA framework assesses different internal aspects of university organisation. Examination of its five conceptual elements for producing a stylised reading of the university's EA in a rural context requires access to sufficient and multiple sources of information. To understand how the regional context has shaped EA in the case of UoL, I have collected a mixed data set; regional policy documents,

key reports and strategies highlighting the university's entrepreneurial dimensions, namely to assess UoL's entrepreneurial *systems, structures* and *strategy*. The documents include UoL's strategy for 2016-2021, a recent impact study, regional policies and websites of innovation support networks in the area. These documents were also utilised when analysing the organisational *culture* and *leadership*, which are more complex dimensions to assess as they reflect institutional and individual attitudes towards entrepreneurship.

In addition, I conducted six additional semi-structured research interviews with UoL's Research and Enterprise personnel, senior management and regional authorities working with local economy and innovation in May and September 2017 and April 2018[2]. The length of the interviews varied from 40 minutes to 1 hour, and the choice of interviewees was based on their positions as they all focus on regional development. Their experience of long-term collaboration between UoL and the County Council was essential not only for assessing collaboration (*systems)* and entrepreneurial attitudes (*leadership & culture)*, but also in reflecting the different ways in which UoL is engaged with the region (*context)*. The interviews were recorded and transcribed. The most meaningful material regarding the research question and conceptual construct of the predicted effect of rural context on EA was retrieved with a thick description (Geertz, 1973; Denzin, 1989) to finally collate a stylised description of how a rural context impacts universities' Entrepreneurial Architecture.

3.2. Case study overview

Lincolnshire is a widely rural region, struggling with a lower skills-base and a diverse economic, social and environmental base (UUK, 2001). Being dominated by very small businesses, its key sectors are Agri-Food, manufacturing and tourism. In addition, the city of Lincoln aims to grow in retail and business services sector together with local universities joint-ventures, such as Lincolnshire Science and Innovation Park. (Lincolnshire, 2016.) The establishment of a new university in Lincoln was a result of a common political will, and its very presence was estimated to be beneficial for the region. Not typically for rural HEIs, it expanded rather quickly from a branch campus to a full-range university (UoL, 2010), aiming to become more research-oriented institution rather than merely a vocational institution responding to the needs of local job market.

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[2] The interview data is part of a larger data set collected for research individual PhD project related to H2020-MSCA-ITN RUNIN – The Role of Universities in Innovation and Regional Development. Some preliminary findings were published in 2018 (Nieth *et al.*, 2018).

Thus UoL is an interesting case for assessing how the rural context has affected its Entrepreneurial Architecture: it has developed a set of mechanisms to support the regional economy and tried to address the problem related to retaining graduates with a number of graduate entrepreneurship services (Regeneris Consulting, 2017). UoL's regional role is described as two-fold: it is both creating the need for business support and providing the services. The establishment of these support activities and large-scale collaborative initiatives, e.g. the Lincoln Science and Innovation Park, is seen as a way to attract more companies to the region, though the activities are mostly located in the Lincoln area. These efforts to build entrepreneurial activities have also been noted on a national level;[3] they are identified and further examined within the EA framework in the following section.

4. The case of Lincoln

This section discusses the Entrepreneurial Architecture of the case university UoL (4.1.), followed by a stylised narrative on UoL's engagement activities through the five key concepts of the EA framework in relation to the specific features of a rural context (4.2).

4.1. Entrepreneurial Architecture in the University of Lincoln

STRUCTURES UoL's efforts to implement the third mission are most identifiable through its range of activities to support local businesses and student entrepreneurship beyond 'traditional' academic infrastructure. The activities have resulted in establishing more structured engagement mechanisms, including the incubation centre **Sparkhouse.** Established in 2002 by Lincolnshire County Council, it mostly provided entrepreneur services to students and graduates, especially in the field of arts and creative industries. In 2004, Sparkhouse became officially part of the UoL, and expanded its focus to serve also external partners, namely local start-ups and SMEs.

UoL currently runs the City Council's innovation centre, **Think Tank,** under a 5-year management contract. Think Tank seeks to support innovative businesses with high-growth ambitions, and it is

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[3] E.g. Three shortlist nominations of the Times Higher Education "Entrepreneurial University of the Year" http://ncee.org.uk/20162017-2/ 30th January 2018.

partially used to accommodate academic activities. Sparkhouse and Think Tank have together supported over 400 businesses and facilitated the creation of 433 new jobs (Regeneris Consulting, 2017). The third key structure to support large-scale innovation and R&D activities is UoL's newly established **Lincoln Science and Innovation Park,** which is a joint venture with the Lincolnshire Co-operative Society, which also owns the land. In addition, there are individual initiatives and externally funded projects to support engagement.

SYSTEMS The University of Lincoln works in close collaboration with various regional stakeholders, including local authorities and businesses. The strongest partnership is with the Lincolnshire County Council. They collaborate regularly through meetings and projects, but there are no formal networks or partnerships despite the management contract of Think Tank and the joint-initiative Science and Innovation Park. As the interviewees described, the collaboration has remained rather "organic" as it relies more on personal connections.

UoL's active role in regional networks was emphasized in all interviews. Strategic partnerships have also led to structural changes; the most successful of these partnerships, long-term collaboration between UoL and Siemens Industrial Turbomachinery Ltd, enabled the opening of a purpose-built engineering school in 2011 - the first one in the UK for the past 25 years (GLLEP, 2016). UoL take part in local business support networks (Greater Lincolnshire Local Enterprise Partnership, GGLEP) and regional partnerships (e.g. Midlands Engine[4]). UoL has facilitated identifying local gaps hindering economic growth, such as insufficient access to local investment, and it has resulted in new mechanisms to enable co-operation between businesses and local investors, such as Lincoln Investment Network (LIN).

The strategic engagement is largely concentrated on mobilising high-level infrastructure initiatives which creates a systemic gap with the coordination of individual academics. Despite many collaboration linkages outside of academia, the interviewees indicated that UoL's internal mechanisms do not support developing external links on lower levels of the organisation, and that engagement relies on individual academics' efforts. Excluding the successful Siemens collaboration, UoL's business

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[4] A Government-driven initiative partnership of region's 11 LEP areas, businesses, universities, local authorities and other stakeholders launched in 2015 (Midlands Engine 2016).

support mechanisms tend to fall outside of the traditional academic infrastructure and there have not been very clear internal linkages between the Research and Enterprise unit and schools and colleges.

LEADERSHIP UoL's staff across the organisation is claimed to be well connected, e.g. some of the personnel are jointly employed by the UoL and GLLEP to facilitate knowledge transfer (Regeneris Consulting, 2017) and the Lincoln International Business School (LIBS) has recently launched LIBS Connect, a series of networking events to bring together academics and local business community.[5] This connectivity implies that UoL aims to play a role as an opinion leader outside academia. As the interviewees repeated, the top management is committed to regional development, though the general engagement is "very much contained within the vice-chancellor" (UoL, staff). The DVCs of external relations and R&I being more concentrated on research activities, the interviewees disclosed the issue of lack of lower level leadership in the area. All data emphasised that the VC, recently awarded for her "services to higher education"[5], is indeed the one who provides a strong leadership in engagement activities, whereas middle managers or Research and Enterprise unit do not sufficiently focus on leading engagement within the organisation.

STRATEGY UoL's strategy for 2016-2021 states that the university seeks to conduct "research with impact", aligning the research agenda with local and economic priorities, especially in Personalised Health, Agri-Food Technology, Creativity, Digital Arts and Archivy and Rural Communities (UoL Strategic Plan 2016-2021, p.14), which are also the key sectors of Lincolnshire's Strategic Economic Plan (2016):

> "We rely entirely on the LEP sectors, which you know, but we could work with any business. But we will focus on the priority sectors." (UoL, staff)

According to the strategic plan UoL aims to generate more employer-led curricula to serve better the local job market, which demonstrates how the university can contribute to regional economic growth by providing graduates and facilitating knowledge transfer. One idea that is mentioned in the strategy is that of the living laboratory, conducting research that contributes to addressing local challenges, but also seeking to create a wider global contribution (UoL Strategic Plan 2016-2021.) However, the strategic aims to strive for entrepreneurial activities are focused mostly on supporting student entrepreneurship with placements, mobility schemes and start-ups, and the Strategic Plan does not

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[5] https://www.lincoln.ac.uk/home/lbs/executivedevelopment/libsconnect/ July 28th 2018.
[5] http://www.lincoln.ac.uk/news/2018/05/1461.asp May 19th 2018.

specify UoL's internal goals to promote a "culture of enterprise and innovation" (p. 5) within the other levels of the organisation. Currently, the internal mechanisms do not explicitly support regional development; for example the workload model emphasises teaching, research and administration tasks whereas enterprise was described as a rather recent and rarely used add-on.

CULTURE Despite UoL's wide range of activities supporting entrepreneurial activities (*structures)* and the VCs personal engagement to regional development (*leadership)*, its dominant culture was described to be rather "conventional" (Uol, staff) and focused on teaching. Also UoL's *strategy* is mostly concentrated on enhancing teaching activities, supporting graduate entrepreneurship and building research on local priority sectors, though it sets a goal to "be entrepreneurial in our activities and practice across the whole institution" (UoL Strategic Plan 2016-2021, p. 5).

A lot of UoL's staff members are in the early phase of their careers, and many people commute to Lincolnshire from elsewhere, which decreases their commitment to the local region; "the university isn't able to attract those with a strong industrial focus" (UoL, staff). In addition, a large number of international staff members do not have linkages with local businesses and the constant staff changes hinders the establishment of personal engagement:

> "And develop that culture throughout the university will be ongoing challenge because universities change staff all the time." (County Council)

All this together, with lack of lower level leadership to support regional engagement makes "enterprise unimportant" (UoL, staff).

4.2. The contextual effects of a rural region on the entrepreneurial architecture of UoL

STRUCTURES UoL's role in regional development was described as both a catalyst and a response to local needs. Despite UoL's wide range of activities to support regional growth, the Sparkhouse, Think Tank and Innovation Park, it currently has a limited number of large-scale R&D collaborations beyond the successful collaboration with Siemens Ltd. In the lack of local business partners, the facilities are partly used for UoL's own activities: for example Think tank has less than 50% of

commercial tenants, and at the time of the interviews, Sparkhouse's office facilities were not used to the full capacity.[6]

Some of the support services, such as Greater Lincolnshire Innovation Programme, rely on external funding, namely European Regional Development Funds, which makes them less sustainable. However, these top-down built initiatives were seen as highly important in reaching more potential business partners: "--one of the reasons we are running the Innovation Programme is that it brings university in contact with more businesses" (UoL, staff), but creating a local market for business support services and institutionalising these entrepreneurial activities require long-term commitment.

SYSTEM. The university's active engagement in local networks was repeatedly highlighted in the interviews: "I struggle to think of a partnership that I sit at and the university is not part of" (County Council). As is typical for rural areas, a small group of actors has a lot of influence and UoL's links with external actors rely heavily on a limited number of personal partnerships. This "organic way of doing things" is more challenging to plan and manage at the lower level of organisation, and also makes it more vulnerable to staff changes, especially as the engagement being embodied by the vice-chancellor:

> "I cannot imagine vice-chancellor saying that right, I want to do some strategy here and some operation here, some tactics here, it's not the way it happens." (County Council)

UoL has managed to create collaboration in the key sectors supporting economic growth in Lincolnshire, namely agriculture and food production, and succeeded in creating a local "buzz" in Lincoln, but there is still a need to promote collaboration between university and businesses for "breaking that barrier between academia and businesses" to increase knowledge transfer within the area (County Council). UoL is still a rather young university, which means that it has a limited number of established partnerships also because the local businesses have a tradition to collaborate with other universities in the surrounding regions:

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[6] Think Tank had 41.57% of commercial tenants (situation 1st August 2017) and the Sparkhouse had 7 empty offices (UoL, staff).

"-- it's about making sure that the businesses know that Lincoln University has the capacity, for ex. many of our manufacturing businesses were going to Nottingham, and we've said that well, actually we've got fantastic facilities built in Lincolnshire." (County Council)

LEADERSHIP In the absence of other key knowledge institutions, UoL's role was emphasized in all interviews: "We have some very good supporters of innovation, in the university of Lincoln and beyond, but not that many of them." (County Council). Therefore UoL has taken the leadership in providing support structures that are not only built in collaboration with external partners, but are partly initiatives that have been designated to the UoL outside of academia:

"The City Council had quite a few challenges running it (Think Tank), the occupancy rate was low and they had challenges to get other people to run it for them, and they came to us asking if we would run it for them." (UoL, staff).

Excluding the VC's active role in engagement, UoL's is still largely missing internal leadership for entrepreneurial activities as internal linkages between entrepreneurial activities, teaching and research were described to be "weak".

STRATEGY University of Lincoln's strategy sets a goal to conduct research that contributes to local challenges: the proposed "living lab" approach strives to find solutions for regional problems that can be transferred multi-nationally in priority sectors (UoL Strategic Plan 2016-2021). It is a natural way of linking academics with local actors, but the nature and specialization of local businesses and ventures encourages collaboration only in few prospective fields. This may limit the university's capability and volume to engage with external actors unless it manages to reach the small-scale businesses "hidden in the region" (County Council) and to establish multi-disciplinary teams to work on these regional priority sectors.

The strategy states that UoL wishes to serve local businesses by establishing more employer-led curricula, thus the employer-driven approach was linked to both university's core missions. The interviewees raised a concern about rooting university's activities too much in the local needs at the expense of academic excellence, but UoL's staff pointed out that all entrepreneurial efforts are still linked to the core mission as "the more businesses we have involved in the more we have research and innovation -- it's a route for impact for us." However, the strategy does not address how UoL aims to promote "a culture of enterprise and innovation" (UoL Strategic Plan 2016-2021, p. 5) on different levels of organisation. As one of the interviewees pointed out, "the strategy says where the university wants to be but not enough on how to get there" (UoL, staff).

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CULTURE Although UoL's efforts to build entrepreneurial activities bring together external partners from the county, the current engagement mechanisms have not reached their full potential. They fall somewhat outside of the academic structures and as their linkages with colleges and schools are vague. A majority of staff members are concentrated on teaching activities; there is a lack of local collaboration possibilities and personnel see engagement being spearheaded almost exclusively by the top management.

Some of the interviewees also raised the issue of how much more can be expected from the university, because "just the very fact that the university exists is very strong for regional development" (County Council). Taking into account the limitations of the surrounding region, it is reasonable to question how much more the university can and should support entrepreneurial activities when there is less need for knowledge transfer and less possibilities for collaboration.

5. Universities' Entrepreneurial Architecture in a rural region: Lessons learned from the case of Lincoln

The case of Lincoln illustrates that the local needs of a rural region shape universities' EA in many ways. The identified effects on each element of the EA are summarized in Table 3. In the case of UoL, the establishment of a wide range of support activities, some of which have become more sustainable structural engagement mechanisms, compensates for the lack of other knowledge institutions in the region. These *structures* are either results of collaboration with external partners (e.g. Lincolnshire Science and Innovation Park) or activities that had been handed over to the university from local stakeholders (e.g. Sparkhouse, Think Tank) and they tend to fall outside of traditional academic infrastructure. The existence of these structures demonstrates mainly the university's will to support regional development and to fill in a gap of local knowledge transfer, but it is difficult to reach their full potential in an environment where there is less demand for such services and fewer potential partners. On the hand, universities are expected to contribute to creating a local market for these services, mainly by attracting large-scale companies to the area.

Table 3. Effect of rural context on EA

EA Element	Predicted effect of rural context on EA	Observed EA element (UoL)	Effect of rural context on EA
Structure	Regional partners have a limited capacity to absorb knowledge which diminishes the need for knowledge transfer and establishment of business support structures	Large-scale initiatives to attract more businesses to the region by providing state of the art facilities (e.g. Lincolnshire Science and Innovation Park); Research and Enterprise unit has developed a number of incubating services and development programmes to reach small-scale businesses hidden in the region and to reinforce student entrepreneurship	University compensates for the lack of other knowledge institutions by providing a wide range of support services beyond academic infrastructure; Structures established in collaboration with external partners or handed over to the university from outside; Focuses on supporting student entrepreneurship to tackle regional issue in retaining graduates
System	Less large-scale business collaboration; A little distance between academia and public sector; A small number of people have a lot of influence in different networks	A lot of collaboration networks (e.g. GGLEP, Midlands Engine) and strong public partnerships (County Council); Engagement spearheaded by a limited number of university personnel; Recent initiatives (e.g. LIBS connect) to bring together more academics with the local business community	Few large-scale business partners; Little distance between academia, businesses and regional authorities; A small group of people have a lot of influence; Individual efforts compensate weak internal linkages between entrepreneurial systems and departments and colleges
Leadership	High expectations for universities to take leadership in the absence of other regional knowledge organisations	Personal engagement of the top management (especially VC and senior managers); Weak internal leadership of engagement activities	In the absence of other regional partners the university leaders are expected to play leadership roles outside of academia; Engagement linked more to individuals than institutions: Vulnerable to staff changes
Strategy	A restricted capacity to address regional needs in both education and research; Employer-led strategies built on regional priorities	Strong service identity in both core missions (e.g. establishment of Engineering School with collaboration with Siemens Ltd); Emphasizes student and graduate entrepreneurship for retaining graduates within the region; Relies on regional development strategies (e.g. living lab)	Employer-led approach steers curricula design; Provides a broad range of study programmes for responding to diverse needs of the region; Research orientation steered by regional priority sectors; Favours large-scale infrastructure initiatives instead of coordination of individual academics
Culture	Less demand and opportunities to initiate entrepreneurial activities; Traditional academic culture oriented towards teaching activities to produce graduated to the local job market	Orientation and nature of staff "conventional", difficult to attract personnel with strong engagement focus; Overall success of the third mission based on individual efforts, few successful partnerships and large-scale infrastructure initiatives	Lack of tradition of university-business collaboration and culture of innovation in the region; Limited number of potential partners; Only few prospective fields for initiating local research collaboration; Strong focus on teaching activities; Vulnerable to staff changes

Source: Own elaboration.

As typical for rural regions, in Lincoln the academic community works closely with the public and private sector. There is not much distance between academia, businesses and regional authorities, and the collaboration has remained rather "organic" than strategic. The local networks rely heavily on the university's input and these *systems* are mainly built on personal connections outside of academia. The overall university engagement is led by few dedicated individuals that are particularly active in providing a *leadership* in regional networks. Typically for rural environments, a small number of people have a lot of influence which makes a successful engagement particularly vulnerable to staff changes. These external linkages are also challenging to plan and manage on institutional level as they are built on personal relationships instead of formal networks. Thus the overall engagement is more based in individuals' than the organisation's characteristics. In the absence of internal engagement *systems* and lower-lever *leadership* many of the staff members are excluded from these activities.

UoL's rapid growth and expansion demonstrates that a full-range, multi-disciplinary HEI is more likely to be able to cater to the complex needs of a rural area. Currently, its *strategy* focuses on employer-led curricula design for adapting to the emerging local education needs and supporting graduate entrepreneurship. The regional priority sectors also steer heavily towards a research orientation (e.g. Living lab approach). This leads to an assumption that universities in rural regions aim to build strategic goals for education and research activities in response to local needs and strengths, which reflects a strengthened service identity. However, UoL's strategy does not address how engagement can be linked to university's core missions; the strategic aim to cultivate entrepreneurialism in all its activities is rather generic. The internal mechanisms still focus mainly on teaching, and the links between regional engagement and core missions remain weak. This decreases building entrepreneurial *culture* beyond serving the region with producing graduates and conducting research on local priority sectors. UoL is still strongly focused on teaching, which is partly explained by the fact that there is less demand and opportunities to initiate engagement activities and fewer potential partners. In addition, the university, due to its geographic remoteness, has not been able to attract personnel with a strong engagement focus.

The establishment of a range of engagement activities beyond traditional academic infrastructure, mainly entrepreneurial support services, demonstrates how a university in a rural region can be proactive in reinforcing entrepreneurial culture within the region. In the absence of a tradition of local university-industry collaboration, it is not straightforward to create a market for these services. However, universities are expected not only to deal with a diverse economic base, but also enhance it

by attracting large-scale businesses to the region with state-of-the-art facilities. Thus strategic engagement focuses on high-level infrastructure initiatives which creates a systemic gap in coordination of individual academics' engagement activities. Therefore, the overall culture may remain rather conventional and focused on teaching.

To conclude, all the elements of the EA framework are rooted, as Foss and Gibson (2015) noted, to a particular context as summarised in Table 4. The empirical study of UoL suggests that in a rural region especially the *systems,* external linkages with local stakeholders, shape university's *structures* and *strategic* approach to university engagement. UoL's other engagement activities, state-of-the-art facilities and a range of business support services (*structures*) mainly result from a tight collaboration with other regional stakeholders (*systems*), implying that university is filling in the gap in the absence of other local knowledge institutions in a rural region (*context*). These partnerships and external demands have also expanded UoL's curricula design, for example by the establishment of the engineering school and the local priority sectors steer its research orientation (*strategy*). The close collaboration and strategic aim to develop employer-led curricula and research reflects a strong service identity in both core missions.

Table 4. Proposed addition to Entrepreneurial Architecture framework

EA Element	Definition
Structure	Entrepreneurial infrastructure: TTOs, incubators, tech parks, business portals
System	Networks of communication and configuration linkages between structures and departments
Leadership	Qualification an orientation of key leaders toward the Third Mission
Strategy	Institutional goals elaborated in planning documents: internally determined formal incentive structures
Culture	Institutional, departmental and individual attitudes and norms towards the third stream: links with *leaderships, systems* and *strategy.*
Context	Local economic and social environment affecting to the need, volume and potential means of engagement.

Source: Own elaboration after Vorley and Nelles (2009).

6. Conclusions

The impact of the regional and national context of the university are crucial for the development of engagement activities (Breznitz & Feldman, 2012; Foss & Gibson, 2015), which highlights the importance of more context-sensitive approaches for understanding the third mission instead of simplistic one-size-fits-all solutions (Benneworth *et al.*., 2016b; Kitagawa *et al.*, 2016). The aim of this exploratory study was to examine *how rural context impacts on the way universities develop their Entrepreneurial Architecture*. The original EA framework (Vorley & Nelles, 2009, 2012; Nelles & Vorley, 2010a, 2010b, 2011) was expanded to include a contextual element, in this case a rural region, and its predicted impact on EA was examined with a single case study of University of Lincoln.

The case of UoL illustrates, that a particular context has an impact on all the dimensions of the EA framework. A rural context can steer the university's institutional responses towards the third mission especially through the establishment of a wide range of *structures* to compensate for the absence of other knowledge institutions in the region. These structures can result from collaboration networks and external linkages (*systems)* or tasks designated to the university from local stakeholders. In a rural region, especially partnerships (*systems*) and personal engagement (*leadership*) of top management shape universities' engagement activities (e.g. Lindeman, 2015; Oftedal & Foss, 2015). These relationships are based on individual commitment rather than institutional mechanisms, which makes them challenging to plan and manage, and also vulnerable to staff changes.

As in the case of Lincoln, the personal engagement of the vice-chancellor is aligned with Foss and Gibson's (2015) remark that entrepreneurialism is not linked to institutional, but the personal characteristics of leaders. This is emphasised in a rural region where people are known and there is little distance between university, public and private sector. At the same time, many of the university staff members are excluded from the engagement activities, as the *strategy* focuses on high-level infrastructure initiatives, local priority sectors and serving the local job market. All this together with insufficient coordination systems of individual engagement, fewer potential partners, nature of staff members and strategic focus in teaching activities hinders creating an entrepreneurial *culture* in universities based in rural regions.

These tentative results from a single case study of a university's EA in a rural region demonstrate how a particular surrounding shapes a university's orientation and institutional responses to third stream

activities. Therefore, further studies on universities' EA, acknowledging that a particular context has an impact on the way universities build institutional mechanisms towards the third mission, would be beneficial for revealing how universities can contribute to regional development in different contexts, and how the engagement is embedded to their internal mechanisms in these different regional surroundings.

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