Entrepreneurial University Ecosystems: Evidence for London

Technical Report

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Contents

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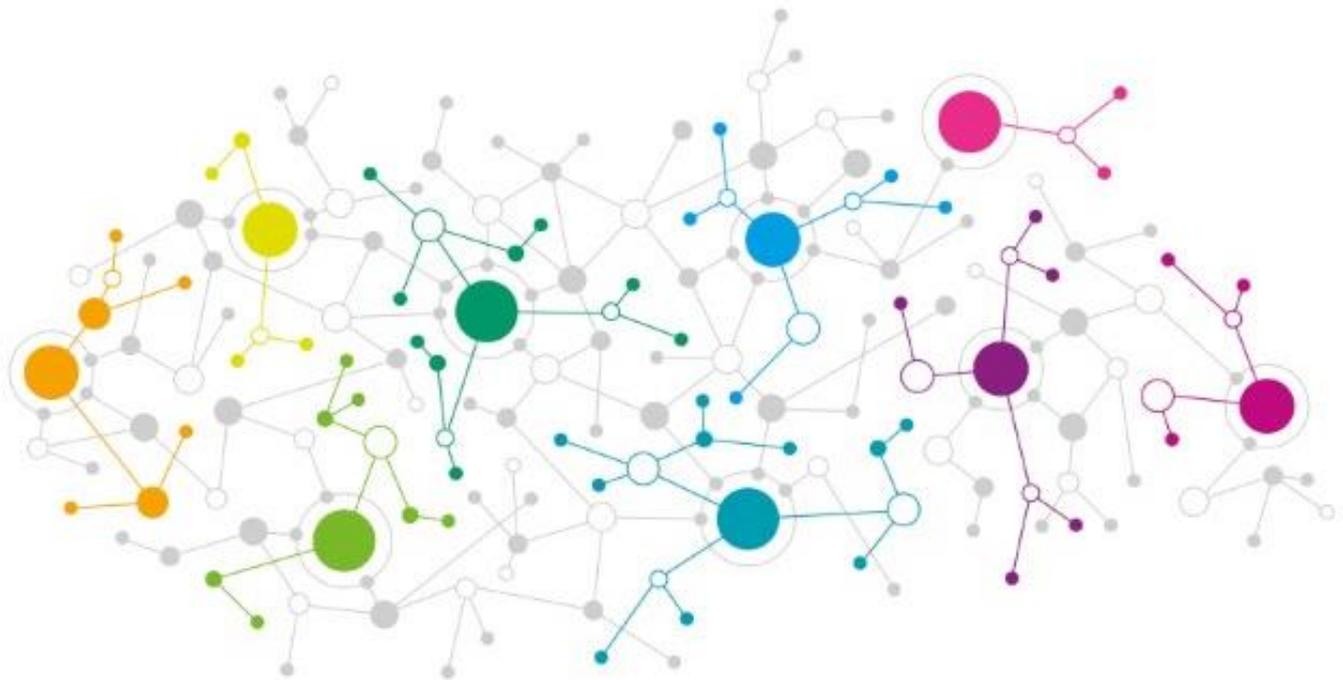
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1. Introduction

Background and purpose

1.1 In 2016 the McMillan Group produced a review of technology transfer and knowledge exchange, recommending the development of an ecosystem approach that was specific to the UK. Several important aspects of ecosystems were identified by the McMillan Review, including external factors to universities, internal institutional enablers and barriers to technology transfer. The review drew on examples of good practice from other locations, including Silicon Valley and Kendall Square in Boston. However, it also stated that such well-developed ecosystems identified in the USA were not directly transferable, thus indicating the need for a context-specific ecosystem approach for the UK.

1.2 Since the McMillan Review was published in 2016, the UK policy context has evolved, making the recommendations laid out in the Review more pertinent. A key target outlined in the Industrial Strategy is to increase R&D spend to be 2.4% of GDP. One way in which Universities can contribute to this target is through supporting the creation and early development of the sorts of companies that will be R&D intensive, be they academic spin-outs, student start-ups or other companies that engage with the research base. The Industrial Strategy also outlined five foundations for productivity growth: Ideas, People, Infrastructure, Business Environment and Places. Within an entrepreneurial ecosystem approach these foundations should be considered in an integrated way, whilst also taking the circumstances of a place into account.

1.3 This study was commissioned by Research England, involving partners from London universities, the National Centre for Universities and Businesses (NCUB) and the British Business Bank. These organisations have formed a Project Group that has helped to steer the study, which had three aims. These were to:

- produce a literature review reflecting upon the concept of the entrepreneurial university ecosystem, including a summary of the potentially key relevant features of the London ecosystem

- construct a high level conceptual model of a 'general' entrepreneurial ecosystem, whilst also developing a tailored London-specific model for further testing[1]

- compose a technical note outlining the options available to compile further evidence, with options including primary data collection, to test the framework in London and inform policy-makers.

1.4 This paper specifically meets the third aim, i.e. the technical note, reflecting upon the findings of the literature review to identify gaps in research and understanding of the London ecosystem. This paper outlines how to apply the general conceptual framework in London and provides a list of parameters and topics requiring further investigation to aid in further assessment of London's ecosystem.

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[1] Note that the term conceptual framework, rather than model, has been used as this provides a more accurate description of the approach (as opposed to, say, computational models).

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1.5   It was not intended that this project would propose any policy implications. Instead, the technical report sets out the range of potential options for further research into the London ecosystem. At this stage, the deliberate intention was to provide a range of options that cover the breadth of issues identified in the literature review. Nevertheless, the technical report and literature review have identified some policies or areas of practice that could be considered in future – though these do not constitute recommendations.

1.6   The technical note does not establish priorities as this was to be a focus of subsequent discussions of the Project Group. Further studies may be undertaken, be they directly or commissioned by London universities, that may progress options outlined in the technical note, and the findings of these studies could inform future policy interventions.

Approach to the technical note

1.7   The approach taken to the technical note included the following steps:

- The literature review was used to identify key findings regarding London's entrepreneurial university ecosystem, alongside areas that appeared to be important but were not well evidenced by research.

- Building on these findings, a conceptual framework of the ecosystem in London was developed to introduce a systems-based approach to considering the entrepreneurial university ecosystem and the parameters and key areas of interest that are likely to be important within it, as well as any linkages between these. Both a complex and a simplified framework were developed to enable interpretation alongside an appreciation of the complexity of the ecosystem.

- Based on the findings from the literature review and ecosystem framework, a long list of parameters was identified as relevant for consideration when developing evidence on the ecosystem in London. An initial longlist was shared with the Project Group, together with a set of associated examples of subjects or questions that could be considered for further investigation.

- Based on the feedback from the Project Group, the parameters and areas of further investigation were refined and added to, with additional detail provided on how evidence could be collected on each parameter and used to inform the Project Group's next steps.

Structure of the paper

1.8   The rest of this paper is structured as follows:

- Section 2 presents and discusses the two conceptual frameworks developed of the entrepreneurial university ecosystem in London.

- Section 3 sets out, for each of the six key themes identified within the literature review, a set of associated parameters and questions/issues for further investigation, alongside detail regarding how further evidence could be collected.

- Section 4 discusses the Project Group's key next steps together with how this note could be utilised to inform them.

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2. Conceptual framework

2.1   A series of themes were identified as important from the literature review, and these informed the structure of the literature review report. These were: universities; business support, accelerators and incubators; commercial space; entrepreneurial finance; networks; and leadership. The literature review presented evidence under each of these themes and some of the linkages between them. Building on these findings, the literature review introduced a systems-based approach to considering the entrepreneurial university ecosystem. Aligning with the literature review, this technical note proposes to adopt the themes identified in order to consider the London ecosystem. It also proposes that a systems-based approach is taken to consider the parameters that are likely to be important both within and across these themes. This section introduces the conceptual framework that could underpin such a systems-based approach.

Simplified framework

2.2   The literature review paper presented a general simplified ecosystem framework, which is represented in Figure 2-1. This sets out the major actors in the ecosystem as well as physical aspects such as infrastructure, commercial space and other amenities. It also shows that links between these different actors will be important in supporting and developing the ecosystem. Outside of the immediate ecosystem, but still with an influence, are wider national and local policy frameworks such as national innovation and enterprise policies, and regulatory frameworks.

Figure 2-1: General simplified ecosystem framework
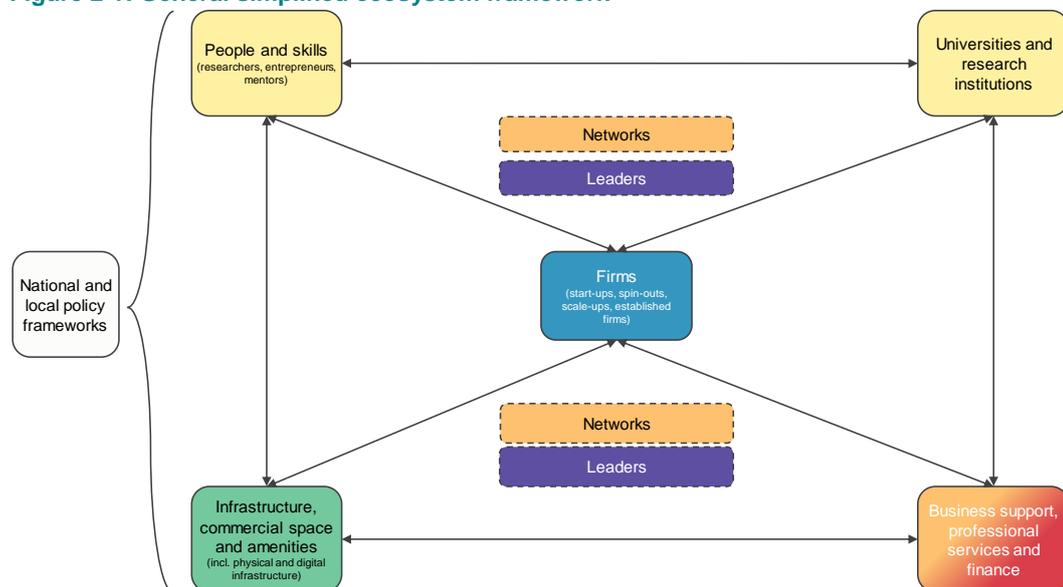
Source: SQW, Middlesex University

Ecosystem framework

2.3   The previous framework, set out in Figure 2-1, is deliberately stylised to enable simplified presentation. However, a weakness in analytical terms is the limited extent to which it draws out the more complex set of interactions and inter-relationships that are more likely to reflect

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reality. In order to seek to address this, a more complicated graphic is shown in Figure 2-2. The graphic is annotated, showing some of the findings from the literature review and key issues requiring investigation in the London context. These annotations particularly relate to how actors and other aspects of the ecosystem may inter-relate. An inquiry into the ecosystem could hone in on particular actors/aspects and interactions, and/or potentially focus on subsystems, e.g. how do these actors/aspects and interactions work in this neighbourhood or for this sector?

2.4   It is proposed that a systems-based approach is taken to assessing the London ecosystem, building on the framework depicted in Figure 2-2. The essence of a systems-based approach involves the following steps, undertaken in an iterative way:
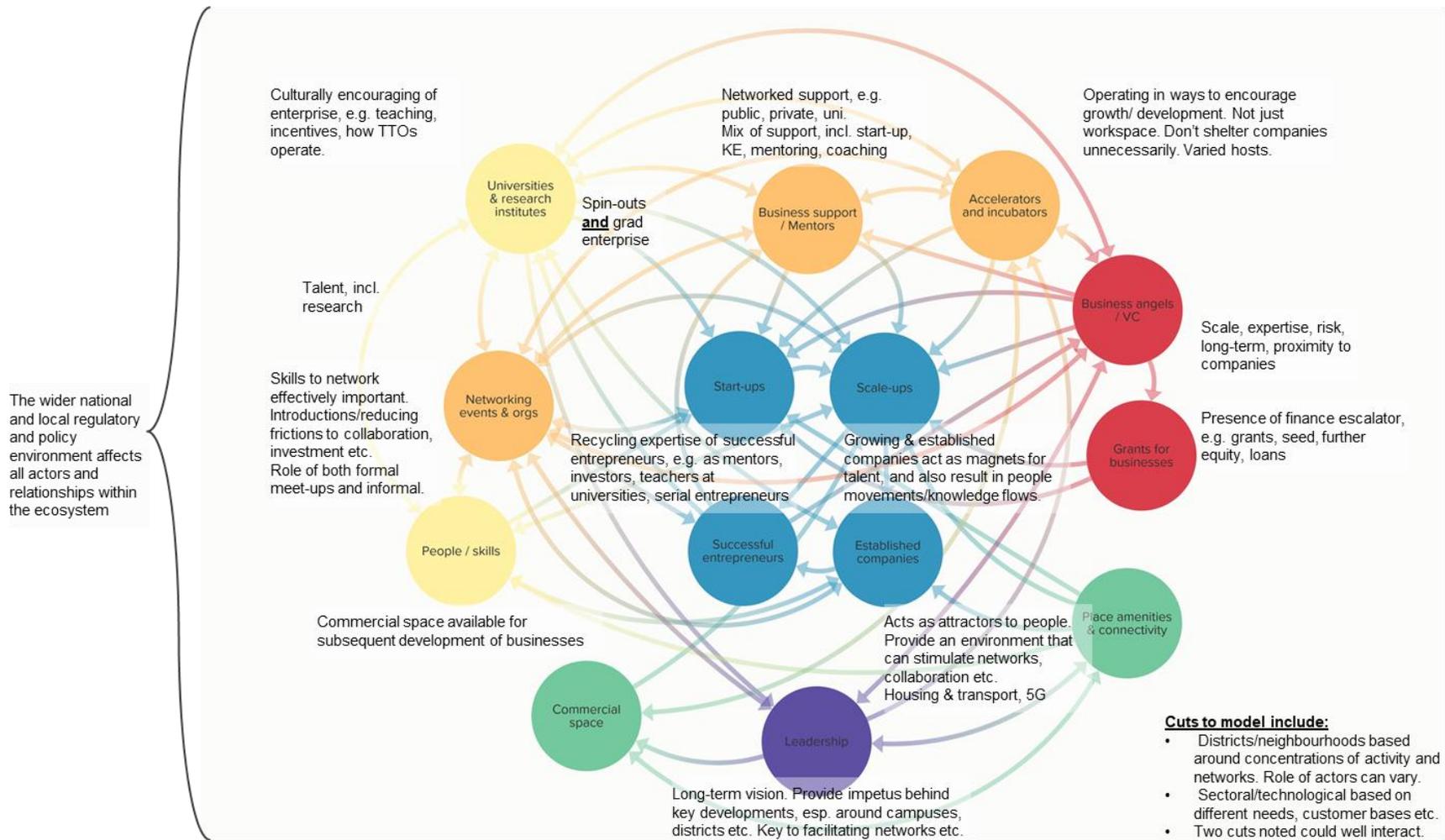
- There is an acceptance that the 'issue' under investigation, the London entrepreneurial ecosystem, is a complex one involving a tangle of inter-relationships. These are identified in Figure 2-2.

- The factors involved in the system, including how they are evolving and are linking with other factors, are analysed to understand patterns and processes, and how these are supporting and developing the system.

- These findings may then inform an intervention(s) in the ecosystem to seek to make it work more effectively. In doing this, the framework (and evidence) could be used to consider different scenarios as to how the ecosystem may develop if certain changes can be made, e.g. through intervention.

- Different perspectives on the system are sought (e.g. the perspectives of different actors within it), which may result in the re-evaluation of factors involved, and how the patterns and processes are understood.

- As the system changes, including in response to intervention(s), further analysis is undertaken.

2.5   Two further points are important to note:

- By the nature of what is included in Figure 2-2, the conceptual framework has defined boundaries. It may be that narrower boundaries are defined, or indeed that boundaries are reviewed, resulting in new actors or aspects being included.

- The ecosystem will inter-relate with others or other actors outside the system itself. There is a need to consider these as part of the openness of a systems inquiry.

2.6   Drawing on this approach, Chapter 3 provides a set of parameters and issues for further investigation. These are based around the themes identified in the literature review, and deliberately seek to provide a basis for understanding inter-relationships within the ecosystem. As such, links between actors/aspects in the framework, and between the themes are cited. It is proposed that some of these parameters and issues for further investigation are subject to evidence collection, analysis and interpretation, in order to better understand how the London ecosystem is operating. The findings of such investigation may then inform intervention(s) to seek to improve the effectiveness of the ecosystem.

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Figure 2-2: Complicated ecosystem framework

Culturally encouraging of enterprise, e.g. teaching, incentives, how TTOs operate.

Networked support, e.g. public, private, uni. Mix of support, incl. start-up, KE, mentoring, coaching

Operating in ways to encourage growth/ development. Not just workspace. Don't shelter companies unnecessarily. Varied hosts.

Universities & research institutes

Spin-outs **and** grad enterprise

Business support / Mentors

Accelerators and incubators

Business angels / VC

Scale, expertise, risk, long-term, proximity to companies

Talent, incl. research

Skills to network effectively important. Introductions/reducing frictions to collaboration, investment etc. Role of both formal meet-ups and informal.

Networking events & orgs

Start-ups

Scale-ups

Grants for businesses

Presence of finance escalator, e.g. grants, seed, further equity, loans

The wider national and local regulatory and policy environment affects all actors and relationships within the ecosystem

Recycling expertise of successful entrepreneurs, e.g. as mentors, investors, teachers at universities, serial entrepreneurs

Growing & established companies act as magnets for talent, and also result in people movements/knowledge flows.

People / skills

Successful entrepreneurs

Established companies

Commercial space available for subsequent development of businesses

Acts as attractors to people. Provide an environment that can stimulate networks, collaboration etc. Housing & transport, 5G

Place amenities & connectivity

Commercial space

Leadership

Long-term vision. Provide impetus behind key developments, esp. around campuses, districts etc. Key to facilitating networks etc.

Cuts to model include:
- Districts/neighbourhoods based around concentrations of activity and networks. Role of actors can vary.
- Sectoral/technological based on different needs, customer bases etc.
- Two cuts noted could well interact.

Source: SQW, Middlesex University

3. Parameters for consideration

Introducing the parameters

3.1 This section sets out a long list of parameters that we have identified as being relevant for consideration when developing evidence on the entrepreneurial-university ecosystem in London. These were identified based on the findings from the literature review, as well as evidence gaps regarding the London ecosystem that arose from the review. An initial longlist of parameters was developed and provided to the Project Group for review, and feedback from that review has been included within the parameters set out below. However, it was agreed that **the scope of the longlist should not be narrowed down further at this stage**. Therefore, the list of parameters should be seen within that context, i.e. a **longlist that will require prioritisation**.

3.2 Within this section, we have also provided examples of how these parameters could be translated into relevant subjects or questions for further investigation. Both the parameters and these subjects/questions are intended as being objective observations of possible issues and aspects of the London ecosystem that may be worth further investigation when developing a factual depiction of the London ecosystem. They were selected largely due to their relevance to the key findings of the literature review, and the subsequent discussion with the Project Group on these findings. They are **not intended as comprehensive lists nor to set specific research priorities**, the latter requiring further discussion by the Project Group. Alongside each group of parameters, we have also provided commentary regarding suggested methodologies and approaches through which evidence on each parameter might be sourced within subsequent phases of work.

3.3 Against this background, the following pages set out the **parameters**, possible **subjects/ questions for further investigation** and **relevant sources of evidence**, structured within the same **six key thematic groups** set out in the literature review: universities, business support, commercial space, entrepreneurial finance, networks and leadership. A seventh group, on cross-cutting issues pertaining to the ecosystem has also been included. Moreover, it is important to note that there are significant cross-overs and links between the themes, which are highlighted within the tables on the following pages where appropriate.

3.4 For some of the parameters identified, the sources set out in the following pages provide readily available data and evidence that could be used to enhance current understanding of London's ecosystem. In most cases, detailed analysis of such data would be required to gain insights into the roles of each parameter at an institutional, sectoral or sub-regional level. There is also an opportunity to deepen understanding of parameters and how these interact by building on current datasets and linking them, e.g. building company-level datasets or drawing on databases of incubators and accelerators. Finally, for some parameters, there will be a need for more in-depth and bespoke research and data collection. This could include primary research with key ecosystem actors, such as local authorities, investors, networking organisations and businesses. The principal ecosystem actors can be found in Annex A.

3.5 Data collection, analysis and research will require investment of resources, and this will be an important factor for the Project Group in identifying priorities for the next stage.

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Parameters by theme

Universities

3.6   Table 3-1 below sets out a series of parameters to consider on the role of universities within London's entrepreneurial university ecosystem. There is a focus on start-ups and spin-outs from London universities following the literature review and discussions with the Project Group. Of course, there are wider considerations in relation to knowledge exchange, some of which are picked up under other themes. In addition, Table 3-1 sets out aspects associated with entrepreneurial culture and partnership working and references a range of types of enterprise, including social enterprises (the relevance of which across the themes is discussed in Annex B). We have recommended that in the first instance, desk-based review of existing data and information be conducted to provide as full a picture as possible. In most cases, these could be supplemented through surveys and qualitative work with key stakeholders within Universities and relevant businesses.

Table 3-1: Parameters for the universities theme

Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
Start-ups and spin-outs: spin-outs with/without HE ownership; staff start-ups; graduate start-ups; social enterprise start-ups; graduate/academic start-up and spinout performance (e.g. in terms of IP produced, company value, GVA, social/community value etc.).	• How many start-ups/spinouts are linked to universities, how do these vary by type (e.g. staff/graduate/social enterprise)? • How successful are London universities in generating start-ups and spin-outs and how does this vary by type of university? ➢ These first two bullet points could be linked to entrepreneurial finance to consider a question such as the following: where did founders of venture capital-funded businesses in London graduate from? • The contribution of university start-ups and spin-outs to the economy and society, including 'grand challenges' (or equivalent). • What is the role of universities in engaging with local civic and cultural sectors? And what is the role in contributing to social enterprise development?	Desk-based review of university and business data. Sources include: • Data from HESA (e.g. HEB-CI survey data) on overall numbers of start-ups and spin-outs. • Spinouts UK, Beauhurst, Crunchbase, Companies House, and data from universities themselves on firm-level data. This review will require further fine-grained firm-level data on sectors and performance. This could be gathered through surveys (e.g. with businesses) or through linking to firm-level datasets. Research should also consider variation by such aspects as discipline/subject area, sector, technology. This parameter could be linked to parameters under *entrepreneurial finance*, *commercial space* and *business support* – especially where company-level datasets could be created to

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Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
	• Relationships to place and location of start-ups.	consider the related issues of starting up, accessing finance, location and the use of commercial space, and the use of different forms of business support.
University support for enterprise culture: number/quality of entrepreneurship-relevant courses taught as degrees and/or short courses (e.g. business, technology); incentives provided to staff for engaging in entrepreneurial research/activity (e.g. rewards, career development, recognition); number/quality of student-led entrepreneurship extra-curricular groups/activity; funds/ support programmes allocated to student/staff entrepreneurship/ relevant fields by universities.	• How is entrepreneurship culturally encouraged (e.g. led by opinion-formers and leaders, through teaching of entrepreneurship across courses, led by students and alumni)? • What role does the university play in enabling entrepreneurship? • Where could provision and encouragement of enterprise be improved? • What are the incentives/reporting structures for university activity in entrepreneurship? • What university provision is available for start-ups of different types? • How do universities engage with students to unlock student entrepreneurship? • How do universities encourage social entrepreneurship/ drive enterprise within the local community? • Is enterprise an integral part of the institutions strategy or is it a separate unit?	Research exercise examining the entrepreneurial culture within London universities. This would involve a desk-based review of data and information in the first instance, covering the issues listed in the parameter column, as well as questions identified. Data sources include: • Data from universities (e.g. on courses taught, funding allocated, support programmes for entrepreneurship, student groups). • Unistats, HESA, Discover Uni for available university courses/their quality. • Student unions at London universities (for data on clubs and societies). Further qualitative work with University staff (e.g. enterprise offices and/or leaders/staff in relevant departments) may be required to validate data and provide a richer depiction of non-quantifiable aspects (e.g. university 'culture', institutional practices around entrepreneurship e.g. rewards and incentive structures). Research should also consider variation by such aspects as discipline/subject area and the types of enterprise encouraged. This parameter could be linked to the *leadership* theme, particularly when considering the development of an entrepreneurial culture.
Interactions/partnerships: between universities within London; with universities outside of London; international partnerships (by distance from London/the UK); cross-disciplinary partnerships; partnerships with other research bodies e.g. Catapult network; the	• How do universities interact with one another in London/outside of London; is there any variation between the two?	Desk-based review of information using available data from London universities in the first instance, focusing on the number and nature of formal partnerships held by universities.

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Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
effectiveness of these partnerships in terms of joint IP/ spinouts/ start-ups / knowledge development/exchange.	• Are there processes/institutional practices in place within London universities that encourage cross-disciplinary activity? • The extent to which entrepreneurship cuts across universities?	This would then need to be supplemented by bespoke research with key stakeholders within universities to assess the nature of, and outputs from, partnership working. Research should consider how these parameters vary by discipline/sector/institution. This parameter can be linked to the *leadership* theme, when considering the extent of partnership working across leaders within the ecosystem.

Source: SQW and MU

Business support, accelerators, incubators

3.7   Table 3-2 below sets out a series of parameters for considering the role of business support within the London entrepreneurial university ecosystem. Overall, key parameters are around the types and delivery of business support (ranging from graduate training, through incubation and R&D, to corporate mentoring/coaching), the quality and effectiveness of provision (depth/intensity and range of support allied to assessment of mutual benefits as a crucial means of sustainability, good practice and ultimate impact measures), and the linkages of business support which can help with complementarities across support and universities' fullest participation. We have recommended a combination of: collating existing University Technology Transfer Office (TTO) and London business support agency (e.g. London Enterprise Panel, LEP) data; survey work to understand the value and impacts of different types of support (on all participants); and qualitative evidence from case studies to evidence good practice and potential transferability.

Table 3-2: Parameters for Business Support

Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
Types and delivery of business support: Type of business support services and mentoring offered (including types/ sources of mentors); Features of support and IACs (e.g. space and the terms, support, etc.); Networking opportunities offered within/across business support. As part of this, to include provision of support by universities, including role alumni mentoring from	• Detailed mapping of the provision, distribution and characteristics of business support and IACs (links across to *Commercial Space*), including: ➤ Different roles of public, private, university and other third sector/civil society actors. Different types of support available within	Desk based work to identify the different providers and support approaches. This could be complemented by primary research. Potential sources of data include: • University TTO data and local survey data commissioned by LEP/growth hub and key sector support service providers.

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Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
past university start-up/entrepreneurs at no/low cost – (developing a forward paying culture).	these, e.g. within universities this might include provision by students and staff etc. ➢ How support distinguishes different company types and stages, e.g. early stage ideas vs closer-to-market products and services. • What is the extent of mentoring or forward paying culture. What is the formal and informal role of mentors in universities, incubators, accelerators etc.?	• Qualitative data collection on the different types of provider (including potential for case studies) and what they provide for what types of entrepreneur or company. Research should also consider the role of mentors in provision and the source/ expertise of these mentors.
Effectiveness of support Quality/relevance of business support being offered; Impact of the support on entrepreneurs, businesses, universities and academics; the extent of feedback loops for mutual benefits. Origin, tenure and destinations of participants/tenants of support.	• Of what quality is the knowledge exchange, business support services and mentoring offered (as perceived by users, universities/academics and other stakeholders)? • What is the impact on sustainability, social value as well as economic measures – including through supporting social enterprise? • What is the additionality of public funding of business support?	Build an evaluation culture amongst all providers of business support: • Ensure that all business support has evaluation designed from the start. In particular, ensure all recipients provide consent to tracking their progress over time. Set up monitoring and evaluation of initiatives to help build evidence on what works, in what contexts etc. • Quasi experimental or experimental evaluations that provide comparison groups to allow rigorous assessment of the additionality of business support. Qualitative studies of the perceived quality and relevance of knowledge exchange and business support (e.g. amongst businesses and academics), with case studies of perceived successful and unsuccessful knowledge exchange/business support (taking both supplier and recipient perspectives). Mapping/surveys of participants in business support to understand how originally signposted, what else they engage in, and destinations (in the case of former tenants of IACs) – this links across to the *Universities* and *Commercial space* themes.
Linkages for business support (including knowledge exchange) and IACs:	• What relationships exist between actors, including partnerships that combine public,	Desk-based review of shared initiatives (i.e. joint working across partners) – and mapping of relationships.

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Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
• Extent and nature of linkages with universities in London. • Extent and nature of linkages with other parties, e.g. corporates, financiers, public sector. • Extent and nature of linkages between business support. • Extent and nature of key business support linkages beyond the London ecosystem.	private, university and/or other civil society, and the changing dynamics? • How do support providers ensure complementarity? What is the nature of cooperation and competition between support providers? • How can business support be combined with physical space? • What are the key business support linkages extending beyond the London ecosystem?	Bespoke research studies on the actual implementation of support and the relationships between providers, including consideration of changing relationships over time. Surveys of recipients of business support could include issues associated with choice of provision and perceived differences/similarities. There is a significant link across to the *Networks* theme.

Source: SQW and MU

Commercial space

3.8   Table 3-3 below sets out some of the parameters to consider when conducting further research into the role of physical commercial space within the London entrepreneurial university ecosystem. Key sets of parameters focus on the take-up and availability of affordable and viable commercial space by entrepreneurs, both at the start-up stage and as businesses grow and scale. A third parameter grouping focuses on the quality and availability of physical and digital infrastructure and proximity to clusters. Where possible, an initial review of available data and literature has been recommended, however, data on most parameters suggested is scarce and variable in quality and coverage. Therefore, conducting primary research with key stakeholders within Local Authorities, businesses, commercial property developers, and universities is likely to be necessary. There will be a link across to the *Business support* theme, in particular as part of mapping and understanding provision.

Table 3-3: Parameters for the commercial space theme

Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
Take up of commercial space for start-ups: vacancy rates and rental values by type of commercial space (incubator, accelerator, co-working spaces etc.) and their offer (e.g. of additional business support, networking events etc.); variation in vacancy and rental	• Is there a shortage of affordable and viable commercial space for entrepreneurs in London? How does this vary by the type of space/offer/developer (e.g. across IACs, with	Desk-based review of data on the location, cost, type and developer types of commercial spaces, building on data collected and presented in the London Enterprise Panel's paper[2] and research commissioned by BEIS[3]. Sources include:

[2] London Enterprise Panel (n.d.) *Supporting places of work: incubators, accelerators and co-working spaces.*
[3] Bone, J., Allen, O. and Haley, C. (2017) Business Incubators and Accelerators: The National Picture. BEIS research paper number 7

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Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
values by London geography, proximity to specific sub-ecosystems/clusters and their sector focus, association with university partners (including as developers); variations by type of IAC e.g. whether they are supporting social enterprises or mission driven; number of developers working in/specialising in incubators, accelerators or co-working spaces (IACs) and how this varies by sector focus and location.	university-developers)? Do more viable options exist outside of London? • Where do start-ups/spin-outs and staff or graduate enterprises tend to locate and how does this distribution vary by sector and geography (e.g. proximity to central London/within the M25/outside of London)? Is there any relationship between location and firm productivity/growth/innovation?	• EGi and CoStar: for vacancy rates and rental values for offices, as well as where universities or co-working and innovation centre operators are developers/managers of the space. However, these resources would likely not provide complete coverage on all indicators mentioned above. Also, it is limited to use class for businesses i.e. whether the business is an office or warehouse. • The London Office Rental Guide: for commercial space costs within London commercial locations. • Statista: for London office rental costs and vacancy rates. • Commissioned reports or state of the market reports developed by commercial property agents. This will likely need to be supplemented with primary research. This could be collected through surveys or interviews with key stakeholders within Local Authorities, commercial property developers (and universities where they are acting as developers) and business tenants. Research should consider variation by geography, sector and the type of commercial space. This parameter could be linked to parameters within the *Universities, Entrepreneurial finance* and *Business support* themes.
Availability of grow on space: number of businesses graduating from IACs to larger commercial space and how this varies across London geographies, sectors, through association with universities (e.g. if they are spin-outs, graduate enterprises or had a university partner); the geography of graduation from IACs to larger commercial space i.e. do businesses move into London, out of London, out of boroughs or London zones (e.g. within the M25) etc.; the quality, vacancy	• Is there an absence of options for companies looking for grow-on space? How does this vary across sector and geography (including within the M25/outside of London)? • Are there any barriers to businesses accessing space in the right locations, including rental values/quality? Do these force	As above, initial research would consist of a desk-based review using similar sources. Further qualitative research with similar stakeholders as listed above could be conducted around areas such as the impact of shortages of grow-on space on new enterprises. Similarly, research could investigate further whether there

Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
rates and rental values for grow-on spaces within London and surrounding areas; number of developers/schemes focused on grow-on space.	companies to move away from where they would like to be based? • Are there any barriers to the provision of grow-on space?	are patterns of businesses leaving London as they grow and any reasons for this. Research should consider variation by geography; sector and the type of commercial space businesses are graduating from. This parameter could be linked to *business support, entrepreneurial finance* and the *universities* themes. It could also be linked with parameters within the *leadership* theme, particularly where local leadership have played a role in encouraging the development of commercial space.
Geography and infrastructure: number and density of key neighbourhood cluster areas within London, travel time and availability of transport connectivity between these; availability of high quality connectivity and digital infrastructure by London geography.	• How does location and travel time to a neighbourhood cluster affect its performance? *Links to other themes, e.g. on entrepreneurial finance (including focus of investors) and networking.* • How effective is supporting physical and digital infrastructure/connectivity? Is it fit for purpose for commercial space? How does/ could this enable growth? How does this vary by sector/geography?	Review of any relevant literature on these themes. This might include any relevant local authority commissioned reports as well as academic studies. More detailed and relevant data would likely require primary research. This could include conducting interviews and surveys with stakeholders within relevant government bodies, such as the Department for Digital, Culture, Media and Sport (DCMS), London Boroughs and cluster managers (i.e. for the Knowledge Quarter, Tech City etc.). This parameter could be linked to parameters within the *networks* theme, particularly when researching cluster areas and their impact.

Source: SQW and MU

Entrepreneurial finance

3.9   Table 3-4 below sets out a series of parameters to consider when conducting further research into the role of entrepreneurial finance within the London entrepreneurial university ecosystem. Overall, key parameters relate to the characteristics (range and types) and behaviour (risk appetite, local embeddedness) of entrepreneurial finance providers for start-ups and spin-outs from London universities, the support services and intermediaries for linking university enterprise with suitable finance, and the complementarity of finance to generate an efficient finance escalator.

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We have recommended a range of existing data and information sources be used in the first instance. In some cases, these may need to be supplemented through surveys and qualitative work, e.g. with key stakeholders within Universities, finance providers and intermediaries.

Table 3-4: Parameters for Universities and Entrepreneurial Finance

Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
Entrepreneurial finance characteristics and behaviour: • Number of investments annually by different types of investor (e.g. VC, angel, accelerator, crowd funder (CF) etc.). • Scale of investment and size of individual investments by early stage of investments (i.e. seed, early commercialisation/scale-up). • Geography of investment by investors.	• Public-private, university combinations (whether internal, close linked university funds). • What are investors' risk appetite for different stage, sector – including whether there are particular investors that invest in university-originated start-ups or spin-outs, and whether there is evidence of any finance gaps? • Experience and track record of investors. • Locational aspects of investment, e.g. postcode preferences or proximity between investors and companies.	Risk financing is highly nuanced, applicability of lessons elsewhere requires local desk-based review of university and business finance data. Likely sources: • University TTO data on spin-outs and financing, including where own/related funding schemes (Imperial, IP Group) • UKRI (Invest UK grants, investments, loans) • London Co-Investment Fund (LCIF) commercialisation investment data • London Business Angel Network (LBAN), BVCA • Beauhurst - British Business Bank equity tracker data (including CF e.g. SyndicateRoom). Fine-grained investor and firm-level data on sectors, financing (stages/volume) and performance could ideally be collected via annual surveys.
Roles and services of intermediaries: interrelationship of business support and advisory networks with universities and entrepreneurial finance types; investment readiness; access to finance finders and equity finance networks; knowledge quality and referral actions by financial and related professional service (e.g. accountants and lawyers) intermediaries; 'pay it on' recycling of mentoring and finance support from successful university entrepreneurs.	• What is the role for investment readiness programmes – e.g. how far does this help to improve quality of demand, and take-up of such provision? • Presence, quality and knowledge base of professional support services (finance finders, accountants, lawyers, intermediaries), and referrals linkages made to them and by them (links to *Networks* theme and role of boundary spanners). • Is there evidence of university entrepreneurs recycling support and finance?	Desk review and survey work triangulating universities' TTOs, finance support networks, intermediaries and professional services. Data sources include: • University/TTO data on business support and IR programmes and linkages. • Local business support programme data of assists and outcomes. Qualitative interviews will evidence knowledge, linkages, quality of provision and processes.

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Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
Range and complementarity of finance: scale, size, stage range of different types of risk finance for university spin-outs and graduate entrepreneurs; includes grants, loans and equity, public and private co-financing; new forms of alternative finance such as CF; crucial need for complementary of financing types along finance escalator.	• What is the range of different types of risk finance available, and the role and complementarity of each within the finance escalator? • Do alternative finance such as CF, corporate accelerators, challenger banks play an increasing role and assist in filling market gaps? • What is the role of social impact investment?	Desk review of the numbers and types of early stage risk finance providers, drawing on: • Beauhurst, British Business Bank data on equity tracker and alternative finance. • Cambridge University/Nesta alternative finance research. • Annual qualitative survey tracking data of university enterprises and investor types is required to understand the flow and complementarity of different forms of investment through investment stages over time.

Source: SQW and MU

Networks

3.10   Table 3-5 below sets out a series of parameters to consider on the role of networking within the London entrepreneurial university ecosystem. Overall, key parameters relate to the range and activities of organisations and key people, the nature and embeddedness of formal and informal linkages, and the density and quality of networks. Obtaining meaningful, readily available data on such parameters can be challenging. Therefore, further research could include in-depth qualitative interviews and larger scale surveys to understand how networks evolve across different spatial levels (neighbourhoods within London through to London's international networks).

Table 3-5: Parameters for Networking

Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
Organisations and players: • Number of formalised networks and range of types of organisations involved (universities, private SMEs, corporates, business support services). • Types of organised networks e.g. sector, stage, location specialisms. • Facilitating network mechanisms.	• What is the role of government business support policies, local level initiatives (e.g. Knowledge Quarter) and intermediaries in facilitating networking? • What is the role of leadership in supporting successful network development?	Formalised networks aim to facilitate the operation of the local entrepreneurial ecosystem, varying in membership and reach. Mapping networks and participants is crucial - key data sources include: • University TTOs and associated business support, outreach services.

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Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
		• Government (e.g. LEP/local authority) sponsored business support agencies (e.g. enterprise agencies, growth hubs).
		• Private business associations and sector trade bodies (e.g. chambers of commerce).
		• Entrepreneurial finance networks (e.g. BANs).
		• Data available from web sources such as eventbrite.co.uk, meetup.com.
		Requires data review and qualitative key informant insights on network operation, participation and processes – lending well to detailed networking case studies. Larger-scale area surveys could reveal the nature and extent of formal and informal networking.
Formal and informal networking embeddedness: • Existence of established or formalised networks/networking organisations. • Extent of informal culture of networking, e.g. supported through physical, social networking spaces (e.g. cafe and night economy, culture of Shoreditch). • Roles performed by networks, e.g. supporting access to the knowledge base, sector/trading links, collaborators etc.	• Do formalised linkages and protocols exist? • How long have formal networks been established? • Whether and how far there is an open innovation culture of inclusivity and accessibility (boundary permeability), or the types of barriers that exist to this. • Is there an informal networking culture, local facilities? • How can networks be extended to places with fewer start-ups and thinner networks?	Desk review of evidence of networks, memberships and their locations and evidence of informal networking physical space and services provision. Data sources include: • Internet searches of public service providers (e.g. LEP, growth hub, enterprise agencies, business clubs), private agencies (chambers, FSB) and other events (meetp.com) offering business support and networking. • University (TTO), Local Authority and GLA data. Selected key informant interviews or large-scale surveys to gain insight into formal and informal network activity.
Density and quality of networking: breadth of local networking culture; accessibility and quality of events/training; sector and locality focus; networking skills of entrepreneurs, trainers and mentors, including 'pay it forward culture' and feedback loops; upstream and downstream connectivity for business; connections beyond local ecosystem for external finance, servicing and markets.	• Quality and effectiveness of networking, as considered in terms of its: sustainability; regularity of networking links and referrals; accessibility and inclusivity; adequacy (capacity) of networking space; and quality/ experience of facilitators etc. • What is the role of boundary spanning intermediaries?	Quality and breadth of networking activity from desk review of university, trade, entrepreneurial finance and government policy data (as listed above). Deeper insight on quality of networks and their impacts, what works and why, is likely to require selective interview evidence or large-scale surveys. This would include understanding of informal networking and the operation of 'pay it forward' cultures in providing re-enforcing feedback loops (that help to sustain and develop networks).

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Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
	• Existence and activities of entrepreneurial mentors and role models (feedback loops) as part of 'pay it forward' culture.	
	• Extent of external linkages into finance, business services and markets.	

Source: SQW and MU

Leadership

3.11 Table 3-6 below sets out the parameters in relation to the role of leadership within London's entrepreneurial university ecosystem. Key parameters focus around the type and quantity of London-based ecosystem leaders, the nature of partnership working between leaders within the ecosystem, and the levels of leadership skills and training. Some data sources currently available could be used to collect data on such parameters, though these largely comprise of university websites, HESA and social network websites such as LinkedIn. In most cases, further qualitative research, involving surveying and conducting interviews with leaders and key stakeholders within ecosystem actors, would enable researchers to develop a more complete view for each parameter. Measuring leadership is challenging, and so a focus on particular aspects of interest and the use of bespoke research may be important here.

Table 3-6: Parameters for the leadership theme

Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
Leaders: organisations/individuals in clear leadership roles within the ecosystem, and coverage by: sector focus/background (e.g. academia, entrepreneurship, business), the nature of their networks/connections.	• Who are the current leaders within London and what is their current role in driving and facilitating the entrepreneurial ecosystem? How does this vary across geographies within London? • What is the balance across London universities of leadership in terms of level of seniority? • What aspects of the ecosystem have leaders had an impact on, or could they have an impact on?	Map London-based leaders using web-based sources such as: • HESA and/or university websites: to identify numbers of managers/directors/senior officials within higher education staff, for survey data on: business and community interactions, reviews of policy and regulator changes within universities. • Government/local authority websites: to identify leadership within government/public office. • Social network websites such as LinkedIn, Inspired Leaders Network, London Women's

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Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
	• What is the extent of cooperation and partnership working amongst leaders and their ability to translate this into actions?	Leadership Network, Data.com Connect and PartnerUp. These could be linked with data from Companies House on company directors and their connections with other companies.
		Further research could be conducted to provide a more detailed view. For example, conducting surveys and/or interviews with universities and other key ecosystem actors may provide more insight into parameters such as the influence of leaders, the ability of leaders to represent/articulate holistic needs of the sector etc. and aspects around partnership working (see next row).
		Research should take into account variation by sector and geography.
		This parameter could be linked to the *networks* theme.
Partnership working: how leaders are engaged in partnership working and how this varies by partner type (e.g. universities, businesses, entrepreneurs) and focus (including sector focus, locational focus).	• What is the role of partnership working within the London ecosystem currently and what impacts has this had on aspects of the ecosystem? How does this vary by sector/geography? • What are the success factors behind partnership-led leadership models for innovation ecosystems?	Web-based review on how leaders are engaging in partnership working and numbers of official partnerships, using sources such as university/business websites.
		As above, conducting surveys and/or interviews with universities and other key ecosystem actors will enable a deeper understanding on parameters such as the engagement in, and role of, partnership working, as well as what has made these successful and the impacts they have had.
		Research should take into account variation by sector and geography.
		This parameter could be linked to the *university roles* theme, particularly when focusing on partnerships between university and business leaders.

Source: SQW and MU

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Ecosystem overall

3.12 Table 3-7 below sets out three further parameters that are more widely relevant when considering the ecosystem as a whole. These relate to: the sub-ecosystems present in London, which could be associated with specific sectors, technologies and/or geographies; the permeability of the ecosystem; and its sustainability and resilience to external shocks. The nature of these parameters means they are likely to require further research, such as with key cluster, sector, university and business leaders both within London and outside of it. These issues could also be considered in relation to the parameters already identified – e.g. it is likely to be possible to undertake sub-systems cuts to other data, and it would be relevant to consider issues such as permeability or resilience in relation to other aspects.

Table 3-7: Parameters for ecosystem overall

Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
Talent and skills: aspects where skills issues potentially hold back elements of the ecosystem.	Incidence of skills gaps and/or skills shortages in terms of: • skills and knowledge of the workforce, entrepreneurs, managers, leaders, support services, research base etc. • specific/technical skills • non-cognitive skills. Future skills/talent requirements for developing sectors and technologies	Secondary evidence from existing research reports and Employer Skills Survey. Analysis of trends in vacancies, e.g. using recruitment adverts online. Primary research (surveys or interviews) with different stakeholder groups.
Sub-systems: the geographic boundary of the London ecosystem and its sub-systems; number and size of the London sub-systems (which could be geographical, sectoral or technological). When discussing parameters, questions for further investigation and data sources on the other six themes set out in the preceding pages, it has been noted that research should take into account variations of each parameter and theme by sub-system.	• What sub-ecosystems exist in London? • How/to what extent do sub-ecosystems differ depending on sector/technology or place-specific factors?	Primary research (surveys or interviews) with key stakeholders including cluster (e.g. Knowledge Quarter), sector, university and business leaders. All parameters within this theme could link to most other themes discussed, as they deal with the ecosystem as a whole.
Permeability: travel time and availability of transport connectivity to key areas outside of London; number of wider national/international linkages with key ecosystem stakeholders; degree to which the ecosystem or a sub-system is recognised outside of London.	• How/to what extent do sub-ecosystems in London interact with each other? • How/to what extent is the London ecosystem connected to systems outside London (including internationally)?	As above, primary research with cluster, sector, university and business leaders. Stakeholders within international-facing bodies such as the Department for International Trade as well as equivalent sector, cluster, university or business

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Parameters for consideration	Examples of subjects/questions for further investigation	Commentary, incl. on how evidence could be sourced
		leaders elsewhere in the UK/internationally could also be consulted.
		Indicators such as value of positive media, or results of international benchmarking surveys would also give an indication of profile/recognition.
Resilience: the sustainability of the ecosystem; ability to respond to economic or political shocks.	• How has the London ecosystem changed in response to significant socks? • To what extent is the ecosystem in London sustainable and equipped to deal with such shocks?	Certain indicators may help inform as to whether there are conditions in place associated with greater resilience, e.g. indicators of innovation, start-up rates, density of networks, how far ideas are shared, and capacity of leaders to put together credible responses.
		Interviews and/or surveys with experts within the functioning of ecosystems as well as economic trends. Stakeholders from long-standing businesses developed through the ecosystem and main ecosystem actors could also be consulted.

Source: SQW and MU

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4. Next steps

Towards a specification for further research

4.1 This technical note has provided a thematically-based longlist of possible parameters for consideration in developing further the understanding of London's entrepreneurial university ecosystem. In doing so, the note has provided examples of possible questions and issues for further investigation, as well as suggested methodologies and approaches for data collection. These parameters should be considered as part of a systems-based approach, which has been developed from the findings of the literature review.

4.2 The intended next steps and further phases of research, as agreed during the final Project Group meeting, are as follows:

- This technical note, including the long list of parameters, should be reviewed and discussed by the Project Group. Based on this review, a time-prioritised list of parameters and/or areas for further investigation should be developed. This could be based on judgements of research areas that are felt to be most relevant within London, and considerations of the viability of research within resource constraints. Within the last Project Group meeting, adopting a sectoral approach was discussed. It was suggested that future research could focus on exploring London's ecosystem in greater detail within a select number of sectors. Sectors of focus could reflect a range and include those known to be successful in London as well as those emerging or less successful. Examples included pharmaceuticals, fintech and fashion. It would be important to establish the detail of what such a deep dive could involve, including any potential challenges.

- Once priorities have been finalised, to explore the parameters set out within this note and how they relate to the ecosystem further, data should be collected on each. This should be done through the collation of readily available data, as well as the commissioning of more detailed research, likely to involve primary data collection. The outcome of this phase will vary and depend on the agreed research.

- The third stage should involve utilising the information collected in the first two stages to develop an overall understanding of how the ecosystem is working, and the links between the actors within it. This should be used to identify patterns, processes, barriers and potential areas for improvement within the London ecosystem. These areas for improvement would inform appropriate intervention – with the effect on the performance of the ecosystem evaluated.

4.3 To guide the second and third phases of research, we recommend that the Project Group consider the following questions when identifying priorities:

- Which of the parameters within the long list are particularly important to consider further in developing London's ecosystem, and how could changes in these affect other elements within it, for example in terms of their impact on bottlenecks or creating virtuous cycles? This might be based on: a view on the magnitude of importance of parameters, and how they might affect other parameters and links

between them; the extent to which the parameters could be changed through intervention; and existing gaps in understanding.

- Which of the possible issues/questions for further research identified do you feel are particularly pertinent to developing a deeper understanding of London's ecosystem?

4.4   Once completed, the research is intended to guide and inform the development of policies that might support improvements within London's, and subsequently potentially other UK cities', entrepreneurial university ecosystems.

Annex A: Actor Mapping

A.1   Table A-1 below maps the different actors within an entrepreneurial university ecosystem by participant type. Examples of actors within each type are also set out for London. This list was developed based on the findings from the literature review as well as the ecosystem map presented in Section 2. The list, and examples provided, are not intended to be exhaustive.

Table A-1: Ecosystem actors/participants

Participant type	Examples in London	Comments
Universities and other higher education institutions	Imperial College UCL London South Bank University Brunel University Queen Mary University University of Greenwich University of the Arts Royal College of Art	42 HEIs in London as well as renowned colleges.
Technology Transfer Offices (within universities)	Imperial Innovations UCLB	
Academic and research talent (scientists, technicians and researchers)	Numerous	Including university staff and students.
Research & innovation institutions and Research centres	Francis Crick Institute National Physical Laboratory Molecular Sciences Research and Translation Hub Digital Catapult	
Teaching hospitals, NHS Foundation Trusts	Guy's and St Thomas' NHS Foundation Trust Hammersmith Hospital	
University spin-outs	Numerous, but some examples: Oslr, Bloomsbury AI, Message Automation Ltd, Bramble Energy Ltd (all from UCL); and Ceres Power, Dynamic Boosting Systems Ltd., Veryan Medical (all from Imperial College)	80% of London's spin-outs between Imperial and UCL.
Graduate start-ups	Numerous, but some examples: Brainpool, Flair Football, Momoby, Freshcheck, Humanising Autonomy	In UCL: In 2017/18 around 50 students created start-ups, employing roughly 75 (FTE) staff and receiving over £4.5m in external funding.
Other businesses/ start-ups / scale-ups	Numerous	
Entrepreneurs	Numerous	
Incubators	Queen Mary Biotech Innovation Centre Accelerator London Breed Reply	

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Participant type	Examples in London	Comments
	Clarence Centre for Enterprise & Innovation	
	London BioScience Innovation Centre	
	Imperial and UCL provide support and incubation in bioscience	
	Digital technology incubator centres in Wilson Street (Shoreditch)	
Accelerators	FinTech Innovation Lab Microsoft Accelerator JLAB (John Lewis) ODI Start-up Accelerator Seedcamp	
Co-working spaces	Whitebear Yard Impact Hub Brixton Digital Greenwich	
Makerspace	Blackhorse Workshop Makerversity	
Science parks	Brunel Science Park South Bank Technopark The London Science Park at the Bridge	
Innovation centres	IDEALondon (Innovation Digital Enterprise Alliance London)	
Property developers	Delancey	
Financiers (business angels, angel groups corporate incubator investors, angel groups, angel capital groups, seed VCs, Venture Capital firms)	Passion Capital VC Episode One EC1 London Business Angels Network	
Business support – business support organisations	Newable Chambers of Commerce Enterprise Agencies – Enfield	
Business support – professional and financial support services	Propel by Deloitte Crunch Russel-Cooke Solicitors VWV IP Group	Accountants, lawyers, finance finding consultants, consultants.
Business support – innovation networks/ networking organisations	Tech Nation Knowledge Quarter London	Networks incl. non-academic networks and informal networking environments. Incl. innovation districts e.g. Silicon Valley and Kendall Square.
Mentors/ advisors	Numerous	
Suppliers	Numerous	

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Participant type	Examples in London	Comments
Customers	Numerous	
Collaborators	Numerous	
Innovation foundations/ centres/ organisations	Examples (operating in London but not exclusively) include: Enterprise Research Centre, Nesta, the National Centre for Universities and Business, the Big Innovation Centre, and the Institute of Innovation and Knowledge Exchange	
Public funding bodies	Research England, Research Councils	
Government (central government; local government; government agencies)	HM Government Local leadership incl. the GLA and the Mayor	National, regional and local policy and regulatory frameworks. Funding.

Source: SQW, MU

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Annex B: Social Enterprise

B.1   Universities can play a key role in the social enterprise ecosystem. This research has developed a framework for understanding such ecosystems and this framework can be applied to social enterprises as well as conventional businesses. Social enterprises are defined as businesses that are trading with a social or environmental purpose. They range from those with a charitable legal form, to those with private sector legal form but prioritising social aims. There is a need to understand how they are supported by the different elements of the university entrepreneurial ecosystem model. In Table B-1 below, we have outlined issues and questions, within each ecosystem theme explored within this report, that may require further investigation.

Table B-1: Issues and questions for further investigation regarding Social Enterprise

Theme	Issue/question for further investigation
Universities	How do courses and extra-curricular activities introduce social enterprise as an alternative form of businesses that combines commercial and social objectives? How does support in universities help with start-up and growth? What are the sectors and locations for social enterprise coming out of universities?
Business Support	Who are the providers that specialise in social enterprise or who offer generic business advice? What data do they hold on university related social enterprises? What types of support are most suitable for social enterprise? How can universities draw on their alumni to offer mentoring and support? What partnerships exist between providers of support?
Space	What are the specific requirements for social enterprises to start up and grow? Do specific social enterprise spaces lead to social enterprise growth or are social enterprises better placed along-side other businesses? What are the requirements for social enterprise grow-on space?
Finance	Who are the suppliers of social investment that is focused on university related start-ups? What are the different types of finance used (social investors, angel investors, crowd funding, banks)? What specific conditions of finance for social enterprise (subsidized, alongside grants, alongside other support)? What is the demand for finance and to what extent are social enterprises 'investment ready' and able to effectively manage their investments and exit strategies?
Networks and leadership	What are the social enterprise specific networks found within a locality/region? How do leading stakeholders support social enterprise?

Source: MU

B.2   Data sources on social enterprise are limited but are found through universities' own sources, from existing social enterprise research programmes and through Social Enterprise UK. There is potential to gather increased knowledge from adding questions into the biannual SEUK survey of over 1,000 social enterprises.

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