

Knowledge and business engagement networks in the Maritime Studies University Strategic Research Group (USRG), University of Southampton

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Executive Summary

The report summarises the findings and outcomes of a research project, commissioned as part of the HEFCE-funded Employer Engagement Initiative (EEI) at the University of Southampton. The ultimate aim of these funds was to increase employer responsive provision in higher education and to focus in particular on the development and delivery of provision co-funded by employers.

As a research intensive institution, the University intended that any education or training provision developed or prompted by the EEI would relate to existing research expertise, and rely on interdisciplinary collaborations; so understanding the academics' views, their internal collaborations and their external engagements is crucial to future development. Furthermore, the aim was to learn from and build upon existing practice and experience, and gather evidence for proposals for change. This research project was an opportunity to gather some of that data.

Maritime Studies was a designated area of interest for the project as the University of Southampton has particular expertise here, and in 2009, a cross disciplinary University Strategic Research Group (USRG) was launched, aiming to promote, connect and reinforce the role of academic research in this field. It provided a broad sample of academic staff with which to work.

We therefore set out to map the knowledge and collaborative networks established by academics and other research and support staff within Maritime Studies. By involving staff in a research project we provided ourselves with an excellent communications opportunity to discuss in detail the EEI, employer engagement and professional development with a range of academics and support staff.

Interdisciplinary collaboration and employer engagement are essential facilitators of employer responsive provision, and the study results (see Summary of Key Findings) aim to inform our institutional strategies and procedures, in terms of:

1. how the institution can best coordinate, support and maximise the benefit from our engagement with employers;
2. how the University can best enhance its research agenda and add value to existing collaborations, including CPD opportunities; and
3. identifying the appropriate support structures and procedures to facilitate employer responsive provision, including means of delivery.

In order to achieve the above, we wished to gain an understanding of the key dynamics in both internal and external collaborations, to document and learn from current practice. It was therefore important to examine processes and experiences, to consider how internal knowledge collaborations were used to establish external contacts and the potential of collaborative opportunities involving multi-disciplinary teams.

As the research involved the Maritime Studies USRG, it also sought to meet some needs of that particular group, so as to maximise involvement in the study. In particular, it set out to:

- document how a range of academics build external collaborations and how this relates to the development of internal collaborations;
- understand the role of USRG-type infrastructures in facilitating cross disciplinary collaboration;
- identify barriers and opportunities for the USRG and external engagement in general;
- develop a research framework and methodology to enable a better understanding of internal and external networks and the support needed for further collaborations (particularly CPD provision).

The findings of this report have already been shared with key stakeholders and an opportunity to use the findings with ECRs has been identified. The institution is keen to use it as broadly as possible. It is intended to share this with the USRGs to help inform their development and to support the University's Education Strategic Plan, by informing employer engagement, external collaborations and the development of employer responsive provision.

Summary of key findings

The decision to undertake this research project, as part of the HEFCE-funded Employer Engagement Initiative, was driven by the potential to contribute to three main goals of the Employer Engagement Initiative (EEI):

1. To inform how the institution can best coordinate, support and maximise the benefit from our engagement with employers

The University and academics interact with a wide range of external actors, but efforts to coordinate this and therefore capitalise on experience and successes have been limited. The research has provided a means to document the current approach of academics (from a variety of Schools) towards employer engagement, both to provide an opportunity to discuss collaborations and the nature of those collaborations, but also to consider the institutional approach or infrastructure which offers support. Interviews and social network analysis questionnaires undertaken were used as communications tools to make academics aware of the Employer Engagement Initiative, asking them to reflect on their external contacts as well as to critically assess the role played by the University and its infrastructure. We also sought to establish how and why academics interact with one another (very important if interdisciplinary collaborations are to be encouraged, as they are at the moment) and how and why they interact with external actors.

Results: The research results highlight a variety of different practices and approaches towards employer engagement within the University. Some of the differences relate to School infrastructure, some to the nature of the research undertaken and the kind of external partners that can be involved and some others relate to the level of experience and career development of the academic. These differences seem to reflect a range of approaches necessary to address engagement in a flexible and adaptive way rather than being owed to structural considerations. In fact, the motivation, benefits and rationale to engage with the outside seem to be shared amongst academics across the whole institution. Furthermore, the necessity and interest for engaging with the outside emerged as a meaningful driver across all kinds of practices. The research reveals for the first time, the range of organisations that the University engages with (in the Maritime Studies field) and gives the University (and its central units) an overview of the barriers and issues which associated with this engagement from the perspective of the academic community.

Key finding: The report highlights that the academic community places a strong intrinsic value on collaboration with external partners. Academics consider this collaboration a two-way exchange; and they value the knowledge, expertise, values and technology outside the University. Academics' main motivation to work with the outside is to have a more complete and often more grounded understanding of their research as part of the real world. Alongside this main motivation, academics perceive benefits for teaching (creative opportunities for the School and students), for bringing in funding and for influencing public policy (or industry practice). The respondents indicated that the University infrastructure does not seem to play a very strong role in supporting this – apart from drafting and agreeing the contracts and terms of agreement – but it is not seen as a barrier to strong engagement. However, the infrastructure tends to sometimes slow down the process of engagement and more flexible support services (such as catering, finance etc) were mentioned as areas for potential improvement.

2. To contribute to our understanding of how the University can best enhance its research agenda and add value to existing collaborations, including CPD opportunities

Developing new and innovative opportunities for Masters (M) level professional development is one of the key goals of the Employer Engagement Initiative. The research has engaged with academics and has tried to make them consider in which way their external engagement overlaps and reinforce their teaching and their contribution towards Continuous Professional Development (CPD) activities. (CPD here is taken to include postgraduate programmes of professional interest, such as a specialist MBA, which could be seen broadly as a form of professional development, or short courses which could lead to a full qualification, or individual modules or elements from a postgraduate course which could provide professional development).

Results: The results of the research highlight that while external engagement allows for major opportunities to reinforce and develop teaching activities, especially internships and MSc collaborative projects, developing CPD activities is not seen by the individual academic as a specific focus or as an area of personal responsibility / engagement. While few academics recognised that their proximity to companies and external organisations provided them with an insight in those organisations' training needs and that there was potential for developing CPD activities, many had not considered this route of engagement as particularly relevant for their research outputs. Some of the academics interviewed who held senior management positions (such as Heads of School) had a better overview of how their School could provide CPD for organisations, and of both the potential and limitations. However, it was clear from the interviews with younger members of staff that development of CPD provision was not considered realistic as it required a

greater degree of knowledge and investment. Other members of staff highlighted the need for a more flexible service infrastructure in the University to allow CPD to take place.

Key finding: The potential of developing external engagement into CPD opportunities is not a widely shared view within the University. While a few senior academics had the experience and overview to see some potential in creating further CPD, the majority could not express a specific view on it. The kind of investment and infrastructure required to enable this form of provision is outside a single academic's reach. From these observations, it can be argued that the development of M level opportunities needs to be happening at the School / Faculty level through dialogue amongst academics, making use of their industrial insights and discipline expertise. However, it also needs to be part of a strategic vision and effort (including specific resources) as the opportunities for CPD are not that straightforward and do not routinely arise from external engagement. Often, there was the impression that consultancy and research projects are an easier solution for companies to acquire the knowledge they need, rather than investing in CPD. CPD seems to be a practice which relates to School or Faculty level decision making, rather than decisions made by individual academics. It requires an institutional infrastructure which supports and encourages this. It was also considered important to find opportunities that offer both parties more, rather than simply provide professional development for income opportunities.

3. To identify the appropriate support structures and procedures to facilitate employer responsive provision, including means of delivery

The EEI aimed to bring about changes to facilitate and encourage employer responsive provision, and this research gave an opportunity to explore perceptions and practice with a particular group of staff. The project aimed to provide a better understanding of the kind of barriers that the University infrastructure presents as well as leading to an understanding of how certain knowledge frameworks – such as the University Strategic Research Groups – might facilitate external engagement. The research not only aimed to inform the EEI and institutional change, but to support the work of the EEI and its Business Fellows. Preliminary findings and research issues were shared during the project to enable a better understanding of academic staff and their views of and approaches to external engagement.

Results: the findings suggest that the USRG – as an intra-University knowledge infrastructure – has created awareness, across different Schools and disciplines, of broader research issues and knowledge and expertise within the University. While this awareness does not guarantee a specific practical outcome (in reference to income generation or actual collaborations being established), it was seen as positive by most academics. The USRG was seen as enabling a better understanding of the strengths and range of expertise available, as well as giving academics confidence in the possibility of establishing new relations. Certain specific issues were perceived as relevant such as access to and timely catering services, or the difficulties posed by certain financial procedures, but also important was the lack of understanding by industrial partners as to the business of the University, a point made repeatedly in research literature.

Key finding: Most academics were satisfied with the degree of freedom they had to establish external relationships. They saw relationship development as something not imposed by the University or School, but a matter best left to their personal and professional judgement. However, particularly for the younger members of staff, there was a need for support, in order for them to be able to maximise their external engagement and to develop further professionalism in interacting with external organisations. Many identified the USRG, the interdisciplinary knowledge network infrastructure, as a potential vehicle to establish and facilitate collaboration internally and externally. Time was mentioned as a barrier in a number of ways, in terms of the time needed both to develop and maintain a relationship, or time taken to process external requests.

Overall, the research project has created a better understanding within the University, and within the EEI, of how academics engage with external organisations. In particular, it has documented the intrinsic motivations of the academic community, as represented by a specific but broad-based group, as well as highlighted the benefits that are experienced. It is hoped that this can provide a way to increase the collaborative dialogues both amongst academics themselves and between academics and the central services at the University (e.g. Research and Innovation Services), which aim to support external engagement.

The methodology adopted aimed to create a framework that can be reproduced to study different interdisciplinary research groupings and also possibly applied in a longitudinal way, thus providing a way to map the manner in which networks and collaborations change over time. It could also be applied to non-research groupings to map internal or external collaboration networks.

Introduction

This research was commissioned as part of the Employer Engagement Initiative (EEI) at the University of Southampton. This was funded by HEFCE, which invested over £60 million in employer engagement projects at various institutions within their 'workforce development programme', to increase employer engagement in higher education and to focus in particular on the development and delivery of programmes co-funded by employers.

The University of Southampton was successful in bidding for some of this funding, to engage employers more closely in the identification and expansion of professional development opportunities, primarily at masters level. Maritime Studies was a designated area of interest for the project as not only is it a flagship area of expertise of the University of Southampton, but since 2009, the subject of a cross disciplinary University Strategic Research Group (USRG), aiming to promote, connect and reinforce the role of academic research in this field. A central aim of the EEI was that any education or training programme developed or prompted would relate to existing research expertise, so academics, their internal collaborations and their external engagements were key to future development. Furthermore, we wanted to learn from and build upon existing practice and experience, and any proposed change were to be evidence based. This research project was therefore an opportunity to gather some of that evidence, while also supporting the development of the USRG.

The Maritime Studies University Strategic Research Group (USRG) is used as a pilot, to understand the way academics and researchers work and connect internally, as a university-wide research group, and the way each of us engages with external partners. We considered this the best platform (and pilot) to investigate the way academics collaborate within a University and the way in which they engage with external organisations. Maritime Studies was also an interesting field in which to undertake the present project as it is a very interdisciplinary area of research, particularly at the University of Southampton, including experts from various research fields, from humanities to ship science, and from law to oceanography. Much of the discussion is about generic external or employer engagement. This is because research¹ indicates that there is still a major gulf of understanding between higher education institutions and the private sector when it comes to collaboration and understanding. We believe that this will increase the understanding of our own practices and processes, and have an application across the piece in employer engagement.

The key for the EEI was what could be learned about cross disciplinary collaborations (to provide broad professional development opportunities) and external relationships (to identify those opportunities). Cross disciplinary relationships are essential for development of a curriculum to reflect broad employer needs, and we need to understand more about how external relationships arise so that we can learn how best to broaden existing relationships and create new ones. The approach to better understand employer engagement was routed through comprehension of current interactions and collaboration in the institution, in particular:

- To document how a range of academics build external collaborations and how this relates to the development of internal collaborations;
- To increase our understanding of the role of USRG-type of infrastructures in facilitating cross disciplinary collaboration;
- To identify barriers and opportunities both for the USRG and external engagement;
- To identify a research framework and methodology to enable a better understanding of internal and external networks and the support needed for further collaborations (particularly CPD provision).

This was to be facilitated by engaging staff involved in the USRG in a piece of research which directly addressed some of their interests as academics in a research intensive university, but which broadened the discussion to include less mainstream activities, such as the provision of continuing professional development opportunities. (Whilst noting that there is of course variation and CPD is well established in some disciplines but not others).

The research began by considering the internal network and then expanded to consider external collaborations. The internal component (of social network analysis) is an important basis for the following consideration of external relations (via analysis of data collected in semi structured interviews). The level of internal collaboration may have a direct impact on external collaborations and contacts, and the structure and features of the internal network and the needs of the individuals and network as a whole may influence what institutional infrastructure and processes best support them. For instance, it may raise questions about how communications take place or how the current structure meets needs.

¹ Bolden R, H Connor, A Duquemin, W Hirsh and G Petrov (2009) Employer Engagement with Higher Education: Defining, Sustaining and Supporting Higher Skills Provision, A Higher Skills Research Report for HERDA South West and HEFCE, July 2009, available online <http://www.cihe.co.uk/category/knowledge/publications/>

Methodology & Data

The research project used a mixed method approach, complementing social network analysis (SNA) with qualitative semi-structured interviews. A Glossary of the terms used in social network analysis is included in this methodology chapter.

In reference to social network analysis, the research adopts two different approaches, during the two phases of the project. During the first phase, a 'complete networks' approach was used. A SNA questionnaire (Appendix 5) was sent out to all members of the USRG (see Appendix 1). In the second phase an 'egonet' approach has been used (see Appendix 6) in addition to qualitative semi-structured interviews.

Anonymity and confidentiality are essential when collecting SNA data (see Ethical guidelines documents Appendix 2). Therefore, the internal network analysis does not include the names of the respondents. Schools, research groups and other characteristics of the respondents are used in the analysis.

The aim of the SNA was to map two types of relations: general awareness and collaboration (table 1 shows the definition provided to respondents of the two categories).

Table 1: Types of relation mapped by the SNA questionnaire

Relation Type 1	I have heard of the person and I am aware of his / her research interests /activities and strengths but I have not actively collaborated with him / her (active collaboration means one or more of the following: a common publication; a common application for funding; a common research project / consultancy; a common teaching module or supervision of shared research students). In the case of support staff (only), this might include simply knowing the person's role.
Relation Type 2	I have actively collaborated with this person in the past (active collaboration means one or more of the following: a common publication; a common application for funding; a common research project / consultancy; a common teaching module or supervision of shared research students). In case of support staff, an interaction on a project is required.

Sample description

The research has used the list of academics provided by the Maritime Studies USRG as a definitional boundary. This is of course not a definitive sample, as we can assume that other people who are not on this list might have interest in the topic, or that people on the list might simply be there to be kept informed about opportunities (like managerial and research support positions within Schools). Nevertheless, it presents a good sample of academics and researchers engaged in this area across the University. As the list of members indicates, it also includes a wide disciplinary spread.

In terms of a description of the sample:

Out of 150 members of the Maritime Studies USRG, 82 returned the questionnaire (a 54.6% response rate).

The following tables provide a further description of the sample.

Table 2: Respondents profile: time at University of Southampton

Time at the University of Southampton	N of respondents
N/A	7
Three years or less	23
Between four and ten years	22
More than 10 years	30
Total	82

Table 3: Respondents profile: age groups

Age group	N of respondents
N/A	1
20-35	8
35-49	36
50+	37
Total	82

Table 4: Respondents profile: Role at the University of Southampton

Role at University of Southampton	N of respondents
N/A	1
Mainly teaching	0
Mainly research	18
Teaching and Research	55
Support	8
Total	82

It is important to consider that the USRG is a knowledge community involving 15 different Schools or divisions within the University. However, the Schools and divisions identified are not equally represented in the USRG. The four main Schools represented are: the School of Engineering Sciences (with 22 members) the National Oceanography Centre / School of Ocean and Earth Science (with 38 members), the School of Humanities (with 22 members) and the School of Civil Engineering and the Environment (with 16 members). While the respondents to the SNA questionnaires did not include all the Schools represented, it can be seen from fig. 1 and fig. 2 that the respondents are representative of the distribution of individuals across Schools and divisions.

Table 5: Description of the whole network and respondents by Schools/ Research Groups

SNA CODE	School and Unit	Number of Individuals in USRG	Response rate	Number of Responses
1	Institute of Sound and Vibration Research	10	40%	4
11	Signal Processing and Control Group	4		2
12	Dynamics Group	1		0
13	Fluid Dynamics and Acoustics	2		1
14	Human Factors Research Unit	1		0
15	ISVR consultancy	2		1
2	National Oceanography Centre / School of Ocean and Earth Science	38	42%	16
21	National Marine Facilities ²	11		3
	School of Ocean and Earth Science	27		13
22	Coastal Processes	2		1
23	Ocean Biogeochemistry and Ecosystems	7		3
24	Geology and Geophysics	10		3
25	Ocean Modelling and Forecasting	3		2
26	Geochemistry	1		1
27	Ocean Observing and Climate	5		2
28	(School of Engineering)	1		1
3	Research and Innovation Services	5	80%	4

² For the purpose of the research we have considered NOC as part of the University of Southampton and the School of Ocean and Earth Science. The only part of NOC which seems to have a separated function/nature are people employed at the National Marine Facilities, so in some areas of the analysis the two groups are considered separately.

4	School of Biological Sciences	1	100%	1
5	School of Chemistry	3	33%	1
51	Synthesis & Catalysis	2		0
52	Electrochemistry, Interfaces & Materials	1		1
6	School of Civil Engineering and the Environment	16	37.5%	6
61	Sustainable Energy Research Group	11		4
62	Environment	2		1
63	Transportation	2		1
64	Infrastructure	1		0
7	School of Electronics and Computer Science	3	0%	0
8	School of Engineering Sciences	22	77%	17
81	Engineering Materials and Surface Engineering	2		1
82	Fluid Structure Interactions	14		13
83	Wolfson Unit	1		0
84	Research Institute for Industry	1		1
85	Energy Technology	1		0
86	Airbus Noise Technology Centre (ANTC)	1		0
87	National Centre for Advanced Tribology (nCATS)	2		2
9	School of Geography	8	75%	6
91	Global Environmental Change and Earth Observation	1		0
92	Earth Surface Dynamics	3		2
93	GeoData Institute	2		2
94	Economy, Society and Space	2		2
10	School of Humanities	22	77.2%	17
101	Maritime Archaeology	3		2
102	English	5		4
103	Film Studies	1		1
104	Modern Languages	2		1
105	History	4		4
106	History / The Parkes Institute	4		3
107	Archaeology	3		2
11	School of Law	5	60%	3
111	Maritime Law	4		2
112	International Law	1		1
12	School of Management	8	75%	6
121	Management Science	3		3
122	Management	4		3
123	Accounting & Finance	1		
13	School of Mathematics	6	17%	1
131	Pure Mathematics	1		0
132	Operational Research	2		0
133	Applied Mathematics	3		1
14	School of Social Sciences	1	0%	0
141	Politics / International Studies	1		0
15	Winchester School of Art	2	0%	0
TOTAL		150	54.6%	82

Qualitative semi-structured interviews

Alongside the internal social network analysis, a sub-sample of the respondents to the first part of the research project was asked to take part in an interview (lasting between 15 minutes and 1 hour). 21 interviews took place between March and July 2010.

The focus of the interviews was on the external engagement of the academics / participants. The interviews were organized in two stages. Firstly, the respondent was asked to provide a sample of the kind of companies, organizations, charities or individuals they worked with outside the academic sphere (Appendix 6). These data are used as a base for presenting an ego network analysis of the data (see findings 2 part) but also to engage with key issues about academics'

external engagement (for more details see interview outline Appendix 4). The key topics addressed during the interviews were:

- The main benefits of collaborating with external partners
- The personal (and career) motivations behind external engagement
- The relation between external engagement and teaching, in particular CPD
- The kind of infrastructures or practices that facilitate external engagement
- The barriers to external engagement experienced
- The role of the university (and USRG infrastructure) in external engagement

Confidentiality and anonymity were provided to the respondents and a confidentiality agreement form was signed by the participants (see Appendix 3).

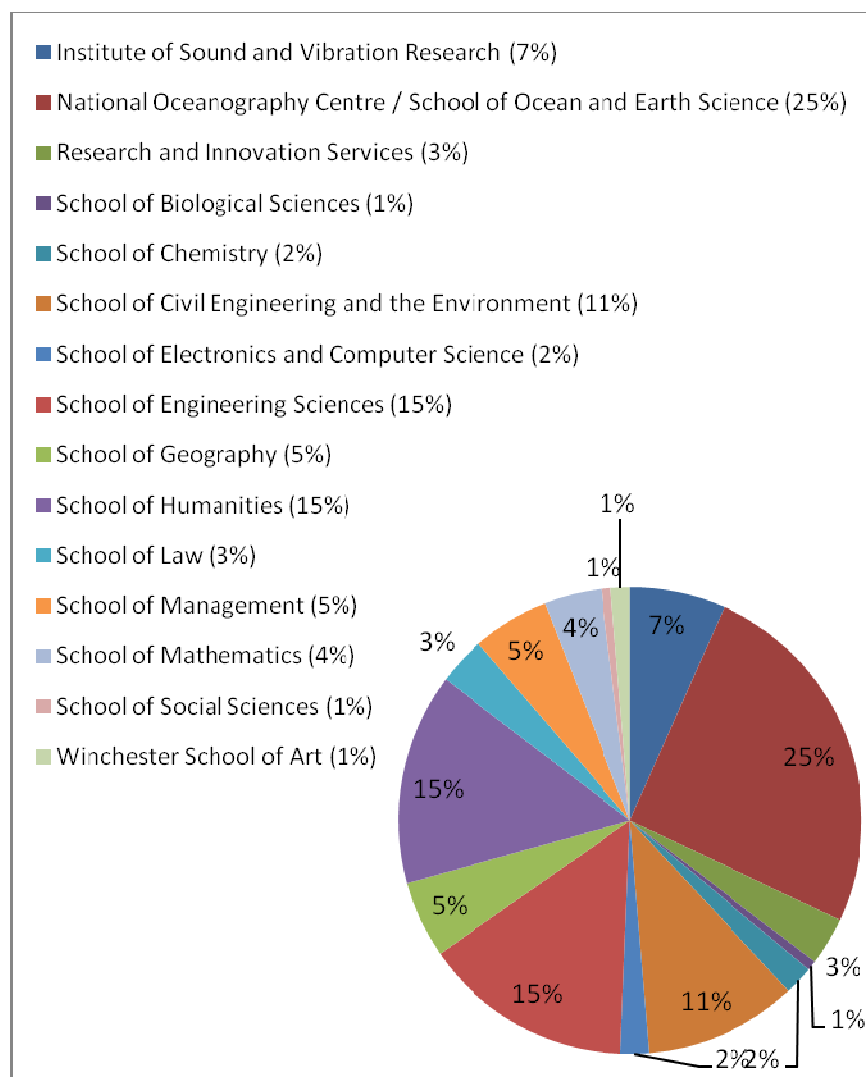


Figure 1: Composition of USRG

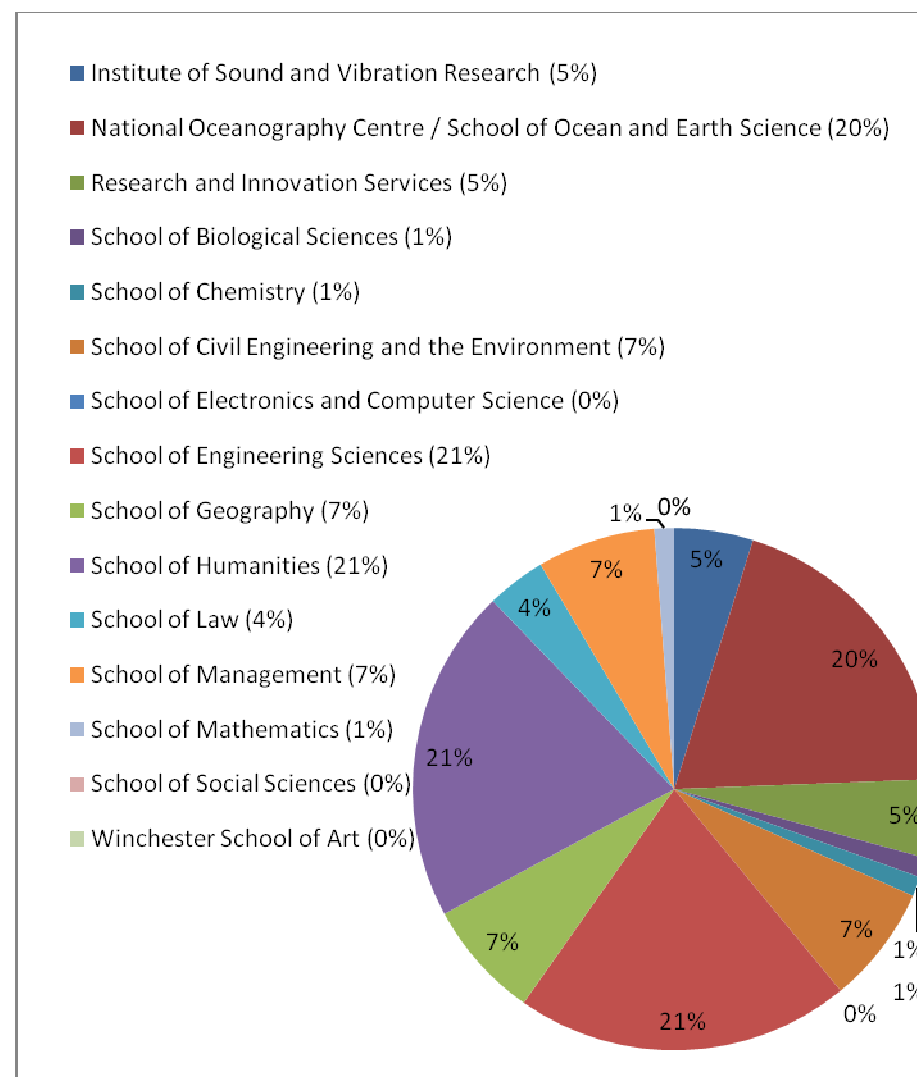


Figure 2: Respondents to SNA survey

Glossary of Social network analysis

Please note that most of these definitions and notes are drawn from Hanneman, Robert A. and Mark Riddle. 2005. Introduction to social network methods. Riverside, CA: University of California, Riverside (published in digital form at <http://faculty.ucr.edu/~hanneman/>)

Betweenness Centrality: With binary data, betweenness centrality views an actor as being in a favoured position to the extent that the actor falls on the geodesic paths between other pairs of actors in the network. That is, the more people depend on me to make connections with other people, the more power I have. If, however, two actors are connected by more than one geodesic path, and I am not on all of them, I lose some power. Using the computer, it is quite easy to locate the geodesic paths between all pairs of actors, and to count how frequently each actor falls in each of these pathways. If we add up, for each actor, the proportion of times that they are "between" other actors for the sending of information, we get a measure of actor centrality.

Complete network analysis: Full network methods require that we collect information about each actor's ties with all other actors. In essence, this approach is taking a census of ties in a population of actors -rather than a sample. Because we collect information about ties between all pairs or dyads, full network data gives a complete picture of relations in the population. Full network data is necessary to properly define and measure many of the structural concepts of network analysis (e.g. betweenness).

Core / Periphery analysis: When we apply the core-periphery model to actor-by-actor data, the model seeks to identify a set of actors who have high density of ties among themselves (the core) and another set of actors who have very low density of ties among themselves (the periphery). Actors in the core are able to coordinate their actions; those in the periphery are not. As a consequence, actors in the core are at a structural advantage in exchange relations with actors in the periphery.

Degree (Indegree and outdegree) centrality. Degree centrality is defined as the number of links incident upon a node (i.e., the number of ties that a node has). Degree is often interpreted in terms of the likelihood that a node will catch whatever is flowing through the network (such as a virus, or some information). If the network is directed (meaning that ties are directional i.e. a to b does not necessarily imply b to a), then we usually define two separate measures of degree centrality, namely indegree and outdegree. Indegree is a count of the number of ties directed in towards the node, and outdegree is the number of ties that the node directs outward to others. For positive social relations such as friendship or advice, we normally interpret indegree as a form of attraction/popularity, and outdegree as a predisposition toward gregariousness.

Density: The density of a binary network is simply the proportion of all possible ties that are actually present. For a valued network, density is defined as the sum of the ties divided by the number of possible ties (i.e. the ratio of all tie strength that is actually present to the number of possibilities). The density of a network may give us insights into such phenomena as the speed at which information diffuses among the nodes, and the extent to which actors have high levels of social capital and/or social constraint.

Ego network analysis: Ego-centric methods really focus on the individual, rather than on the network as a whole. By collecting information on the connections among the actors connected to each focal ego, we can obtain a pretty good picture of the "local" networks or "neighbourhoods" of individuals. Such information is useful for understanding how networks affect individuals, and they also give a (incomplete) picture of the general texture of the network as a whole.

E-I Index: Krackhardt and Stern (1988) developed a very simple and useful measure of group embedding, based on comparing the numbers of ties within groups and between groups. It measures how inward looking (or outward looking) a group is, compared to other groups in the network, and allows us to compare the groups and their interactions. The E-I (external - internal) index takes the number of ties of group members to outsiders, subtracts the number of ties to other group members, and divides by the total number of ties. The resulting index ranges from -1 (all ties are internal to the group) to +1 (all ties are external to the group). Since this measure is concerned with any connection between members, the directions of ties are ignored (i.e. either a out-tie or an in-tie constitutes a tie between two actors).

Social network analysis: Social network analysis views social relationships in terms of network theory consisting of nodes and ties. Nodes are the individual actors within the networks, and ties are the relationships between the actors. The resulting graph-based structures are often very complex, yet they offer rich visual pictures. There can be many kinds of ties between the nodes.

Findings – Part I: Internal knowledge Networks

The USRG is clearly a connected knowledge network. There are no individuals isolated – i.e. none who are completely unaware of others' research. The fact that the network is completely connected (with no isolated nodes) is also expressed, in social network analysis terms, as the network being made by a single component (i.e. all the nodes are part of single united network).

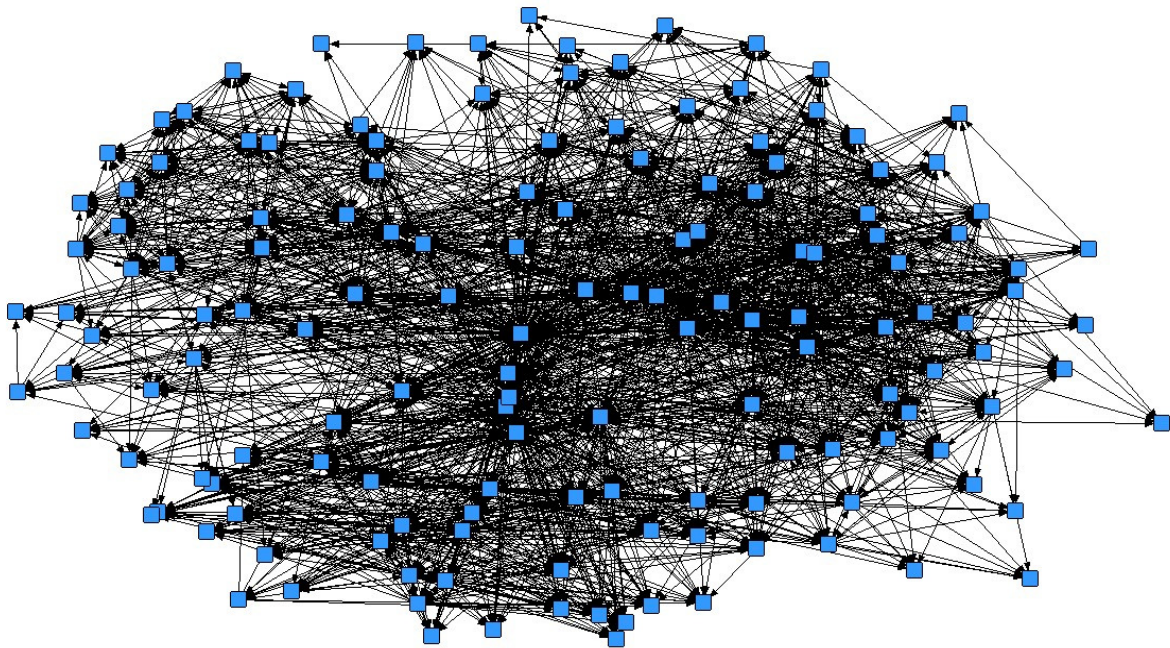
The 150 individuals (represented as nodes) show a great variety in reference to connections. The measure of outdegree and indegree considers the direction of a relationship, outdegree being the number of relationships identified by the individuals themselves, the indegree showing those identified by others (i.e. incoming arrows). As shown in table (1) the range of outdegree (contacts that people named in their questionnaires) ranges from 146 to 5, while most of the respondents have been named (indegree) by 10 to 19 respondents. This highlights that across the USRG the level of interactions and awareness is really varied and we will explore the way this might be linked to the School that the node belongs to, but also his / her academic profile or age group. These findings underline the level of diversity and complexity of interactions, but also the level of individualism of each node, which interacts according to his / her specific interests, social skills and knowledge.

Table 6: Outdegree and indegree

Number of nodes	Outdegree	Number of nodes	Indegree
1	146	1	66
5	79-70	0	59-50
2	69-60	1	49 - 40
2	59-50	12	39-30
16	49-40	48	29-20
23	39-30	69	19-10
13	29-20	20	9-1
14	19-10	0	0
7	9-1		
0	0		
83		150	

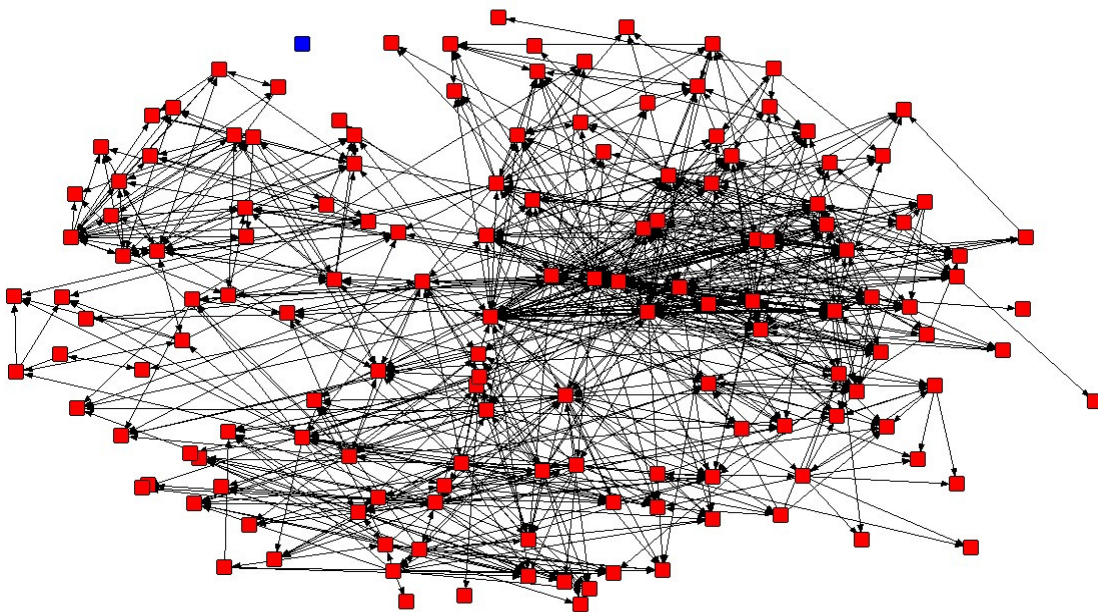
As we can clearly see in Fig.3 the general awareness network is fully connected and it is a single-component network. This means that each component of the can reach every other by some path (no matter how long). This means that any of the USRG members in the network can have awareness of each others' research, or gain access to others via an existing link (passing through others knowledge along the network). All the nodes (academics and other members of the USRG) are represented in blue.

Figure 3: The Maritime Studies USRG awareness network



When we look at the collaborations network, we can see that it is less dense. Although there is still only one major component (including all the red nodes), there is one single isolate (blue node). This suggests that there is someone who has not collaborated with anyone within the USRG to date.

Figure 4: The Maritime Studies USRG network of collaborations (only)



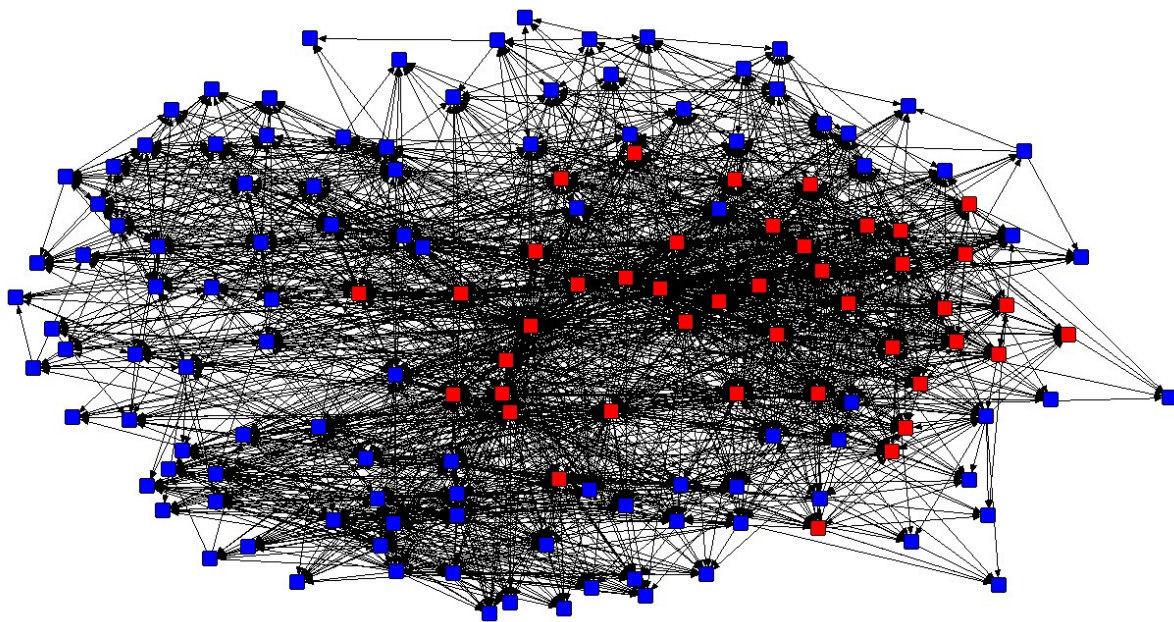
The density measure between the two networks is also interesting. This is the number of current connections as a percentage of the number of possible ties that can be achieved. We can compare the density of the networks in fig. 3 and 4. The awareness network has a density of 16.7 %, while the collaboration network has a density of 8.45% (so nearly half). Of course, as we only have responses from 54.6% members of the network, and assuming that the non-respondents would present a similar type of profile to our sample, we could estimate that in the overall awareness network around 33% of the potential knowledge connections are realized, while in terms of actual collaboration, the figure is around 16%. This means that while there are many connections taking place, these are still only one-third of the possible awareness relations that can take place within

the USRG. There is room for improvement and for this awareness to increase further in years to come.

Core / Periphery analysis

An important analysis is one which enables the identification of the core and periphery. The core is defined by those sets of nodes which have higher level of interactions with each other than others (the periphery). By running a core-periphery analysis, we can observe that there is a strong distinction between the core and periphery. The core is formed of nodes that interact more closely with each other, while peripheral members interact with core members. This implies that while nodes in the core exchange information directly amongst each other, nodes in the periphery tend to receive information only when it is passed by the core and rely on the core to access information or knowledge.

Figure 5: Distinction between core and periphery in the USRG network



As visible in the network image, the red nodes are the core and blue the periphery (fig. 5). Measuring the density of these sub-groups and their interaction, we find that the higher density of interactions takes place within the core. A good level of interaction takes place between the core and the periphery (i.e. directional from core to periphery), but the interaction of the periphery with the core and within the periphery is very weak (see table 7). Therefore, we can identify a sort of hierarchical structure in the USRG where a few nodes have direct access to knowledge and exchange knowledge between them and to a lesser extent send this information out to the periphery. On the contrary, the periphery seems quite detached from the core and it might be the case that valuable information (developed within the periphery) never reaches the core.

Table 7: Matrix of density across core and periphery

	1 (43 nodes)	2 (107 nodes)
1 (43 nodes)	0.695	0.245
2 (107 nodes)	0.071	0.096

It is important to consider which schools are more represented in the core and which ones are more represented in the periphery, as this relates closely to the way information is circulated and how collaboration can be established and strengthened.

Figure 6: Distribution of core and periphery nodes among School / Divisions

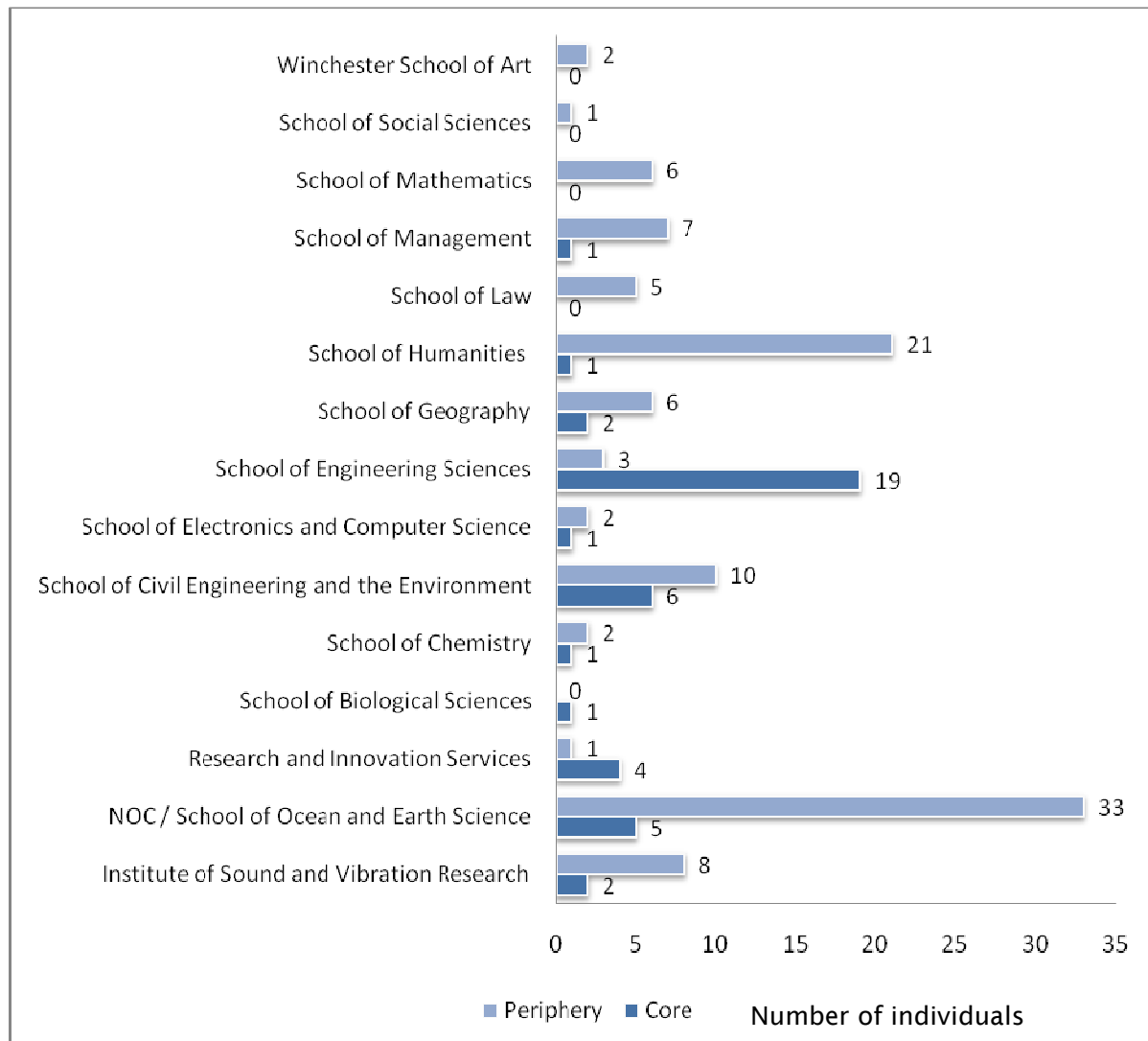


Fig. 6 shows the distribution (as number of individuals) of Schools between core and periphery. The schools which play a stronger role in the core are the School of Engineering Sciences and NOC / School of Ocean and Earth Science, followed by the School of Civil Engineering and the Environment.

Degree Centrality and Betweenness Centrality

In order to better understand the dynamics of the network it is important to consider which nodes are more central and influential. We use two analyses to identify these. Degree centrality allows us to identify the key individuals in the network in reference to recognition and leadership. These individual have access to more individuals and knowledge resources and are key to the network. Differently, betweenness centrality will help us identify individuals not in relation to their leadership but in relation to their position within the network, being key 'bridging' nodes between different type of individuals or groups.

Degree centrality. This is the sum of relations that a node enjoys, and considers both the indegree (number of connections directed towards the node) and outdegree (number of connections sent out by the node). In our network, as we have results from 54.6% of the nodes, we will look both at degree centrality in general and most specifically the indegree centrality. Usually, individuals with a high degree centrality maintain numerous contacts with other network actors. Individuals have higher centrality to the extent they can gain access to and/or influence over others. A central actor occupies a structural position (network location) that serves as a source or conduit for larger volumes of information exchange and other resource transactions with other actors. Central actors are located at or near the centre in network diagrams of social space. In contrast, a peripheral actor maintains few or no relations and thus is located spatially at the margins of a network diagram. Table 8 considers the (academic) position of the individuals with

highest indegree (the most named in the network). The indegree number (first column) indicates the number of other individuals who named this person. Amongst these 25 individuals, 12 occupy senior positions (Professor, Head of Schools or Head of Research Groups). So, while a degree of leadership helps in being recognised in the network, 8 of the nodes represent younger and mid-career academics, indicating that there are opportunities also for younger member of staff to become key players in the network. Although the data on the length of service at the University of Southampton (third column) is patchy, amongst the 14 individuals who provided this information, 8 have been at the University of Southampton for more than ten years and only 3 for less than 5 years, showing that the length of employment plays a role in being recognised within internal networks.

Table 8: Description of nodes with highest indegree

INDEGREE	ROLE / POSITION	YEARS AT UoS
94	Head of research group	-
61	Lecturer / Senior Lecturer / Senior Research	16
53	Lecturer / Senior Lecturer / Senior Research	-
52	Professor	-
51	Lecturer / Senior Lecturer / Senior Research	16
51	Head of research group	15
47	Head of School	-
46	Consultancy unit	-
46	Head of research group	37
45	Lecturer / Senior Lecturer / Senior Research	10
43	Researcher / Research fellow	2
43	Support	6
41	Professor	-
40	Professor	-
40	Professor	17
39	Head of research group	-
39	Professor	-
39	Lecturer / Senior Lecturer / Senior Research	3
39	Lecturer / Senior Lecturer / Senior Research	-
39	Support	2
39	Support	-
38	Consultancy unit	7
37	Deputy Head of School	11
37	Lecturer / Senior Lecturer / Senior Research	4
37	Head of research group	10

Table 8: Role / position of nodes with indegree higher than 35 (including how long they have been working at the University of Southampton, if information available)

It is important to consider the number of connections and their quality (i.e. simple awareness vs. active collaborations).

Amongst the 82 respondents we find a great variation. At one extreme, one person is aware of 146 (highest value) nodes while another is aware of only 5 (lowest value). The average number of nodes (or individuals) that each respondent is aware of in research terms is 34.5. The values are obviously much lower for the collaborations network (as defined in table 1). They range from 0 to 45 (the largest amount of collaboration). The average number of active collaborations for each respondent is 11.7. In some cases the indication of awareness is almost the same as that of project collaboration (87.5% overlap for one of the nodes) for others there is no strong overlap, which can be read positively as people seem to be aware of others' research although they are not their strict collaborators. In general an average of 35.8% of the awareness network represents the nodes with which the person actively collaborates. .

Table 9: Turning awareness into collaborations

Node	Outdegree Awareness	Outdegree Collaboration	Relation between awareness / collaboration (%)
1	13	6	46.2
4	22	6	27.3
7	27	8	29.6
8	23	12	52.2
9	32	7	21.9
10	46	10	21.7
11	19	6	31.6
19	38	13	34.2
25	53	15	28.3
26	41	19	46.3
27	29	16	55.2
29	32	10	31.3
30	35	28	80.0
31	64	28	43.8
33	40	17	42.5
34	7	5	71.4
35	58	30	51.7
37	Highest 146	44	30.1
38	35	20	57.1
39	39	16	41.0
40	42	14	33.3
41	70	44	62.9
42	37	10	27.0
44	31	2	6.5
45	36	17	47.2
46	46	13	28.3
48	40	6	15.0
50	46	19	41.3
51	18	7	38.9
52	8	2	25.0
53	21	9	42.9
54	7	1	14.3
58	18	4	22.2
61	41	23	56.1
63	36	19	52.8
64	44	12	27.3
67	34	13	38.2
71	13	5	38.5
74	37	12	32.4
78	73	3	4.1
79	75	12	16.0
81	7	4	57.1
85	75	21	28.0
88	41	16	39.0
90	38	7	18.4
92	33	13	39.4
93	36	4	11.1
95	63	7	11.1
98	40	18	45.0
99	24	11	45.8
100	44	7	15.9
105	30	12	40.0
112	18	2	11.1
113	30	10	33.3
114	45	4	8.9
115	20	11	55.0
116	38	2	5.3
118	22	2	9.1

119	11	6	54.5
120	28	12	42.9
121	14	4	28.6
123	21	5	23.8
124	12	4	33.3
125	24	21	Highest 87.5
126	33	3	9.1
127	30	6	20.0
128	43	1	2.3
129	28	7	25.0
131	32	4	12.5
134	14	6	42.9
135	Lowest 5	4	80.0
136	43	Lowest 0	0.0
137	12	3	25.0
138	19	10	52.6
139	17	3	17.6
140	40	20	50.0
142	22	8	36.4
143	8	5	62.5
146	35	21	60.0
147	38	28	73.7
148	77	Highest 45	58.4
149	49	26	53.1
Total	34.5	11.7	35.8

Betweenness centrality. Betweenness centrality views a node as being in a favoured position, to the extent that the node is positioned on the 'path' between other pairs of nodes in the network. The measure is normed (expressed as a percentage of the maximum possible betweenness that an actor could have had). There are quite a few differences amongst the nodes which are more central in reference to degree centrality and the ones with a significant betweenness perspective. In particular, looking at Table 10, we can see that apart from one individual (with the highest betweenness), the next twenty nodes have a similar betweenness and are also spread across a variety of Schools and institutions. These nodes seem to function as 'hubs' within the sub-disciplines in terms of connecting individuals within the USRG. These are academics who are generally in senior positions and are either involved in teaching and research, or in research only (only one person was in a support role). As we can see from the table, the betweenness measure is quite different from the indegree, as it is not a measure of simple 'popularity' but identifies a function in the network as being a conduit for communications between different groups.

Table 10: the 20 nodes with higher level betweenness

SCHOOL / DIVISION	Age Group ³	Role ⁴	INDEGREE	BETWEENNESS VALUE
School of Engineering Sciences	3	3	94	15.87
NOC / SOES	3	2	52	2.18
Research and Innovation Services	3	4	52	1.75
School of Engineering Sciences	3	3	63	1.42
NOC / SOES	2	3	31	1.31
NOC / SOES	3	3	30	1.22
School of Geography	3	2	26	1.06
School of Engineering Sciences	2	3	53	1.05

³ Respondents (when the information was given) are classified in 3 age groups: 1 (20-35 years old) 2 (36-49 years old) 3 (50 plus years old)

⁴ Respondents were asked to classify their role as Mainly teaching (1) Mainly research (2), Teaching and Research (3), Support (4)

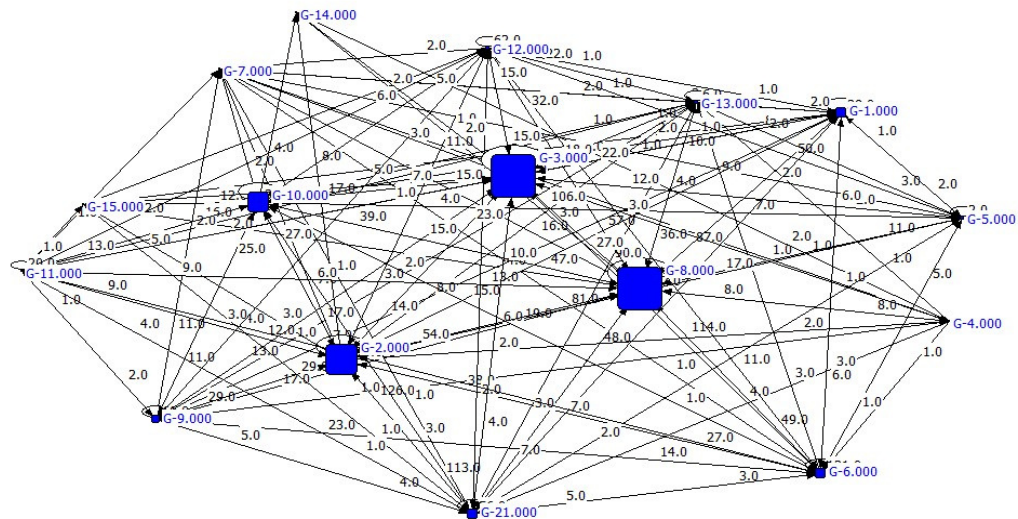
School of Humanities	2	3	28	1
School of Humanities	3	3	45	0.93
School of Geography	3	2	34	0.91
NOC / SOES	2	3	27	0.78
School of Civil Engineering and the Environment	3	2	41	0.75
NOC / SOES	3	3	30	0.69
School of Management	2	3	34	0.66
School of Humanities	3	3	25	0.63
School of Engineering Sciences	3	3	48	0.61
School of Civil Engineering and the Environment	2	3	28	0.6
Institute of Sound and Vibration Research	3	3	30	0.58
School of Law	2	3	18	0.53

While the first betweenness analysis highlights the key role played by certain individuals, it is also import to consider the overall betweenness value of different Schools and divisions. Table 11 and Fig. 8 suggest that two key groups show highest level of betweenness: the School of Engineering Sciences and Research and Innovations Services. They therefore are best placed to be the conduit for information sharing and to connect a variety of Schools and individuals. The value of this is knowing how to get important information out or circulated – using these key nodes will facilitate this.

Table 11: Between value of School / Divisions

SNA CODE	School and Unit	Betweenness value
1	Institute of Sound and Vibration Research	1.882
2	National Oceanography Centre / School of Ocean and Earth Science	6.932
21	National Marine Facilities	2.048
3	Research and Innovation Services	10.182
4	School of Biological Sciences	0.200
5	School of Chemistry	0.750
6	School of Civil Engineering and the Environment	1.922
7	School of Electronics and Computer Science	0
8	School of Engineering Sciences	10.182
9	School of Geography	1.625
10	School of Humanities	4.815
11	School of Law	0.125
12	School of Management	0.615
13	School of Mathematics	0
14	School of Social Sciences	0
15	Winchester School of Art	0

Figure 7: Betweenness value (represented by size of nodes) of the Schools / Divisions



Connections between and across groups

Alongside the role of betweenness centrality of Schools and divisions (Fig. 7), it is also important to consider which groups present stronger connections with other groups. Table 12, presents the sum of ties (including both awareness and collaborative ties – attributing highest value to the second type of ties) between the groups.

If we ignore the central oblique line (which includes the connections within the group or school), it is possible to see that a number of Schools present high levels of cross- collaborations in particular we can see that, within the USRG boundaries:

- The School of Biological Sciences, the School of Chemistry, ISVR and the School of Mathematics are mostly connected to the School of Engineering Sciences.
- The School of Civil Engineering and Environment has stronger connections with the School of Engineering Sciences and the NOC / School of Ocean and Earth Science.
- The School of Engineering Sciences has strong connections with many schools: The School of Civil Engineering and Environment, Research and Innovation Services, NOCS and the School of Ocean and Earth Science and the Institute of Sound and Vibration Research.
- The School of Geography has stronger connections with the School of Civil Engineering and Environment and NOCS and the School of Ocean and Earth Sciences.
- NOCS and the School of Ocean and Earth Science have strong connection with the National Marine Facilities at NOCS and with the School of Engineering Sciences and with the School of Civil Engineering and Environment
- The National Marine Facilities at NOCS has strong relations with the School of Ocean and Earth Sciences
- The School of Humanities has stronger connections with the School of Engineering Sciences and NOCS and the School of Ocean and Earth Sciences
- The School of Law has connections with the School of Humanities
- The School of Management has strong connections with the School of Engineering Sciences and with the School of Civil Engineering and Environment and also with Research and Innovation Services.

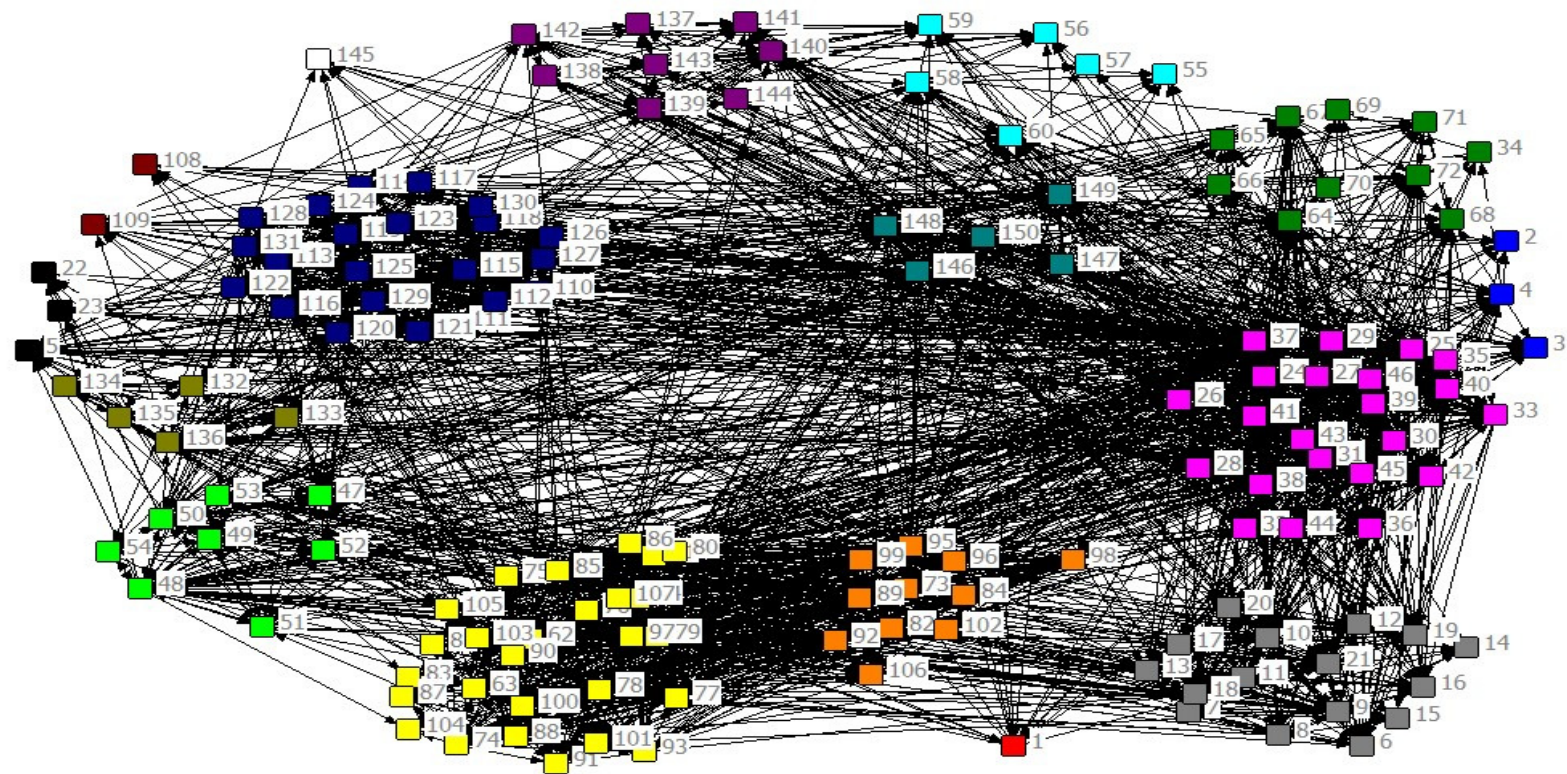
Research and Innovation Services has strong connections with the School of Engineering Sciences and to a less extent with the School of Civil Engineering and Environment, NOCS and the School of Ocean and Earth Science and ISVR

Table 12: Sum of ties strengths within and between Schools and Divisions

	Biol. Sc	Chem	Elect & CS	Civil Engin & E	Engin Sc	ISVR	Geog	Math	NOCS /SOES	NOCS/ NMF	WSA	Hum	Law	Manag	Social Sc	R&I S
Biological Sciences	0	0	1	1	8	0	0	1	2	3	0	0	0	0	2	1
Chemistry	0	2	2	5	11	2	0	3	1	0	0	0	0	0	0	2
Electronics and CS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Civil Eng and E	0	1	1	121	49	6	14	3	27	3	0	1	0	11	0	4
Engineering Sciences	8	17	16	114	537	87	19	36	81	48	4	47	13	57	3	90
ISVR	0	1	3	6	50	38	4	2	9	7	2	1	1	1	0	8
Geography	1	0	11	23	17	7	60	1	29	5	0	11	2	4	0	13
Mathematics	0	2	2	0	10	0	0	6	0	0	0	1	0	0	0	1
NOCS/SOES	2	6	7	38	54	15	29	8	338	126	3	17	12	3	1	14
NOCS/NMF	0	2	1	5	7	7	4	3	113	56	1	3	1	2	0	4
WSA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Humanities	0	4	2	2	39	4	25	5	27	6	12	382	16	8	4	17
Law	0	0	1	3	9	2	1	2	9	4	1	13	20	2	0	5
Management	0	1	2	14	32	1	3	22	1	1	2	5	6	62	0	15
Social Sciences	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R&IS	3	12	11	27	106	22	15	18	23	10	7	15	1	15	2	32

To represent the interconnections between individuals and schools we can also visualize this network (fig. 9) which highlights the density of connections across schools and divisions

Figure 8: Awareness network: interconnections between School and Divisions

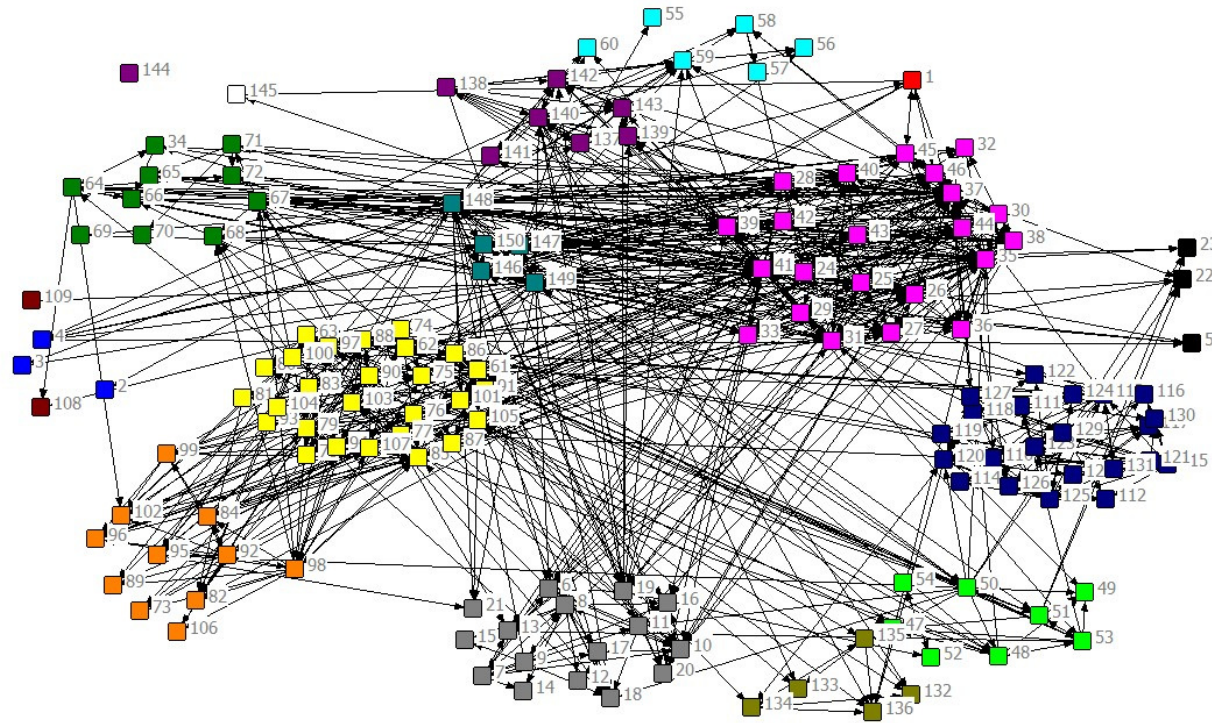


■	School of Biological Sciences
■	Research and Innovation Services
■	School of Chemistry
■	School of Engineering Sciences
■	School of Social Sciences
■	School Civil Engineering and the Environment

■	School of Electronics and Computer Science
■	Institute of Sound and Vibration Research
■	School of Geography
■	School of Mathematics
■	NOC / School of Ocean and Earth Science
■	NOC / NMF

■	Winchester School of Art
■	School of Humanities
■	School of Law
■	School of Management

Figure 9: NETWORKS OF COLLABORATIONS BETWEEN SCHOOLS AND DIVISIONS



■	School of Biological Sciences
■	Research and Innovation Services
■	School of Chemistry
■	School of Engineering Sciences
■	School of Social Sciences
■	School Civil Engineering and the Environment
■	School of Electronics and Computer Science

■	Institute of Sound and Vibration Research
■	School of Geography
■	School of Mathematics
■	NOC / School of Ocean and Earth Science
■	NOC / NMF
■	Winchester School of Art
■	School of Humanities
■	School of Law
■	School of Management

Looking at the interconnections among the Schools and divisions, it is interesting to consider the E-I (external - internal) index. This takes the number of ties of group members to outsiders, subtracts the number of ties to other group members, and divides by the total number of ties. The resulting index ranges from -1 (all ties are internal to the group) to +1 (all ties are external to the group).

The outcomes of this analysis are presented below. We should ignore those Schools / groups with a tiny representation as they easily reach the index of 1 (as they do not have enough colleagues from the same school to balance internal and external ties). If we focus our attention to the more representative and comparable (in size) groups we can see that:

NOC and the School of Ocean and Earth Science have an average level of interaction between inside and the outside, the School of Humanities is the more inward-looking group (with -0.271), while the School of Engineering Sciences seem to be the most outward-looking of the three larger Schools (0.156). Other smaller schools, clearly show high relative levels of interaction with the outside as only a few individuals are involved in the USRG.

Table 13: Group level E-I Index

School and Unit		Group level E-I Index
1	Institute of Sound and Vibration Research	0.518
2	National Oceanography Centre / School of Ocean and Earth Science	0.011
3	Research and Innovation Services	0.846
4	School of Biological Sciences	1
5	School of Chemistry	0.857
6	School of Civil Engineering and the Environment	0.243
7	School of Electronics and Computer Science	1
8	School of Engineering Sciences	0.156
9	School of Geography	0.505
10	School of Humanities	-0.276
11	School of Law	0.621
12	School of Management	0.46
13	School of Mathematics	0.792
14	School of Social Sciences	1
15	Winchester School of Art	1
21	National Marine Facilities	0.605

Preliminary conclusions from SNA questionnaire survey

The use of SNA data has enabled us to explore some of the knowledge and collaboration dynamics emerging within the USRG. These are some of the key findings emerging:

- **The network shows a great variety of connections and collaborations. While all the academics involved are somehow connected (i.e. can possibly access everyone through other people they know), it is clear that there is a strong CORE to the network, where interactions happen at higher intensity.** This is a natural property of the network, as people might only be partially interested in Maritime Studies and might be part of other networks. However, it is important to consider what can facilitate dialogue between the core and the periphery and to make sure that no individuals are excluded, (i.e. ensuring the periphery can easily access the core, or ensuring good communication throughout the network).
- Some key players emerge in the analysis, both at the level of Schools (with School of Engineering Sciences being strongly represented at the core of the network) and at the individual level (i.e. few individuals being central to most of the connections and functioning as hub for nodes to interact with the USRG). **At the individual level, we see a greater role played by professors, heads of school and heads of research group, as well as academics who have been at the University of Southampton for quite a long time.** If we want to achieve change, it may be important to consider the placement of individuals who may take or be given particular roles, implying that a change agent will find it more difficult to function at the periphery than those closer or central to the core.
- **The betweenness analysis has helped to identify two key hubs for information (and possible collaborative opportunity) to be passed on: the School of Engineering Sciences and Research and Innovation Services.** The particularly strong connection between the two also reinforces this knowledge hub. While it is inevitable that the School of Engineering Sciences has strong interconnection with most of the other science-based Schools / divisions, it seems important the Research and Innovation Services plays a more neutral role in bridging towards other non-science based Schools, in order to make sure that knowledge reaches the USRG more broadly.
- **While three main schools (Engineering Sciences, Ocean and Earth Science and Humanities) are almost equally represented in our sample of respondents, it is clear that they have different approaches to cross-disciplinary collaborations.** So far, Humanities seem to have been less outward looking, but this could also be explained by the variety of science-based activities across the University, compared with the clustering of Humanities research in one main faculty.
- **There is a broad message about communication.** If academics want to have something broadly known within the group they can choose to communicate via the key nodes. Obviously the coordinator is one of these, but there are others too and there may be reasons for choosing a particular node for a particular message.
- **From the amount of inter-disciplinary connection, we can assume that the USRG is likely to have played a role in raising awareness, across schools and divisions, of the research activities which are part of the Maritime Studies at the University of Southampton.** The difference between the awareness network and the collaboration network implies this, because while certain academics might have established collaborations, the difference between this network and the broader awareness network can probably be attributed to the USRG's role and activities. This is reflected in some of the interview responses.

Exploring the role of the Maritime Studies USRG

Alongside the internal social network analysis, a sub-sample of the respondents to the first part of the research project was asked to take part in qualitative semi-structured interviews. The analysis of these interviews is the focus of the second part of the report, but here we consider the views of interviewees on the role played by the Maritime Studies USRG in developing or supporting their networking activities.

In general, across a variety of school and career stages, there was recognition of the role that the USRG has played in raising the awareness of others' research interests across the university.

The USRG has broadened my horizon a lot, a year ago I would not know about what was going on around the University in the Marine sector, I am much more aware and having seminar lists and lists of talks (School of Civil Engineering and the Environment)

Further to the general awareness, some of the interviews saw an active role played by the USRG in helping them establish contacts and having greater opportunities

It gave me an opportunity to go beyond the world of museums, the USRG is useful for the business side of things, in humanities this is much more difficult to deal with, it is a problem area for us, but through the USRG we have a route through this and there were some events where we showcase projects and brought in a range of partners, and talk with people from the MoD and local business, I would not have been able to do this, in ship-science they probably do it everyday but not for us, we can plug into a wider range of partners (School of Humanities)

The USRG has given me the opportunity to make contacts, but also to present humanities to the rest of the University, that interface is sometimes difficult, we have lots of things going on, we are doing these things too, and that has been hugely appreciated, it has provided a vehicle where the USRG allowed us to make visits as group and talk about a range of issues and collaborations with external partners. (School of Humanities)

Our contact with the Maritime and Coastguard Agency came out at the USRG, they made direct contact with us, we had a poster presentation ... It was a good interface between industry and university (Institute of Sound and Vibration Research)

Only a few of the 20 academics interviewed were sceptical about the role of the USRG

I am quite sceptical of how useful this is (the USRG) but if there is an expectation the School and individual have to contribute, I am happy to do this (School of Law)

Many of the senior academics appreciated the potential of the USRG, but did not find it specifically useful to their internal and external networks. This was very different from younger members of staff, who saw the value of interacting with a variety of people across the university.

The USRG has not had any effect at all for me, I can see that it makes it look like we are joined up but in reality I do not think we are ... If I want to work with someone I go and find it myself, but maybe it is because I have been here so long, maybe it is different for young lecturers (School of Engineering Sciences)

From a personal perspective the USRG has not really contributed, across the School it might be different, it had a very successful launch event but it is unclear to me how it developed from there (School of Earth and Ocean Science)

The USRG has made me realise how little I know about the university as a whole ... I was staggered by how few people I know outside Humanities... internally the University needs to do more along those lines (School of Humanities)

While many appreciated the range of activities and the links created by the USRG, many commented on the fact that it could do more or enable further connections and opportunities, especially towards external engagement.

The maritime USRG is going to open up new opportunities, avenues where we can do cross-discipline research, there is going to be a lot of cross over, which means that the industrial pool we can tap in is going to grow and the USRG can help bring this together (School of Engineering Sciences)

For the research group it gives us an opportunity to think about bigger projects, spanning humanities and ship science ... for example the museum has a collection of ship-plans, over 2 million, we had discussions involving ship sciences and historians (School of Humanities)

The USRG has not helped so far in my experience but there is no reason why it could not develop to become a more useful framework around which we could develop new relationships (School of Ocean and Earth Science)

I have not seen any direct benefit yet from the USRG but there are possibilities of that, if you have a larger pool of expertise and if we need to access a larger infrastructure ... the more knowledge we have of other people's capabilities then the better it is, so if we get approached by someone, we know who the right person to ask ... (School of Engineering Sciences)

There was also a view that the aspirations and objectives of the USRG could be pushed further and the more visibility would be essential for members to the USRG to reach to new contacts and new opportunities (rather than tapping into the same links which already exists).

The USRG is valuable ... we need to keep raising our profile like that getting our names into the media, however, it takes a lot of effort and time, and often people that are coming to the events are people that we have already links with. (School of Geography)

While many academics appreciated the role of the university in creating further opportunities for external engagement, there was also the recognition that this can never be forced and that the individual academic retained the choice and ability to engage or not in these possibilities

To be honest, when it comes down to meaningful external engagements, it comes down to individual academics with individual research interests, that is the bottom line but the USRG can make opportunities for this to happen (School of Humanities)

Some of the younger members of staff suggested that the USRG could play a role in fostering and supporting younger academics in their efforts to establish external contacts.

The USRG could hold an event dedicated to the extent to which we already have established relationships outside the academic sector and a forum about how one develops in the maritime context these new relationships, so people that have already been successful in establishing new relationships could share their experience with others who are thinking of doing the same thing (School of Ocean and Earth Science)

In order to make the most of an individual's capabilities, the university should give guidance as to how one can maintain one's research in the public sphere, while also engaging with the private sphere ... if the University expects you to do these things, it needs to put something in place that makes that part of staff development ... Maybe working with the private sector or local community, you might be able to shadow someone else and you can see how it works and the opportunities and benefits from both sides (School of Humanities)

Summary

Overall, there is a broad recognition across all career stages and schools that the USRG has helped academics to gain a greater awareness about others' research and activities. **While this is considered important for the growth of the University in the field of Maritime Studies there is some scepticism of how this could be taken forward or how we can build on this awareness to deliver better, larger and cross-disciplinary research projects.** The USRG seems to need a stronger 'political' profile, to take further actions and

initiatives, especially in reference to raising the overall profile of the university and acting as broker for external engagement. **While senior members of staff recognise that this could add value to their work, they also feel confident that they can develop contacts and projects based on their own knowledge of the university expertise. On the other hand,** younger members of staff see in the USRG a possible vehicle to acquire more expertise, interact with experienced academics and engage more professionally with outside partners.

Findings – Part II: External Engagement

Sectors and external engagement

During the interviews, academics provided a range of examples of external contacts. This can give us an overview, although from a limited sample of 21 academics, of the range of sectors and interconnections experienced.

Fig. 10 and Table 14 provide an overview of the academics interviewed (identified only by their School of origin) and their contacts (with the sector they belong to). As we can see, some academics mentioned up to 11 contacts (I asked for a sample of 10) but few of them had fewer external (non-academic) partners; and one of the interviewees did not have any involvement with external organisations (apart from other universities). Overall, it is interesting to notice that each academic tends to work with a range of organisations, although some have strong private sector collaborations (such as number 2 or number 14) or not for profit partners (such as number 9), in most cases we can highlight that academics tend to work across sectors, engaging with private, public and not for profit organisations according to their research interests and topics.

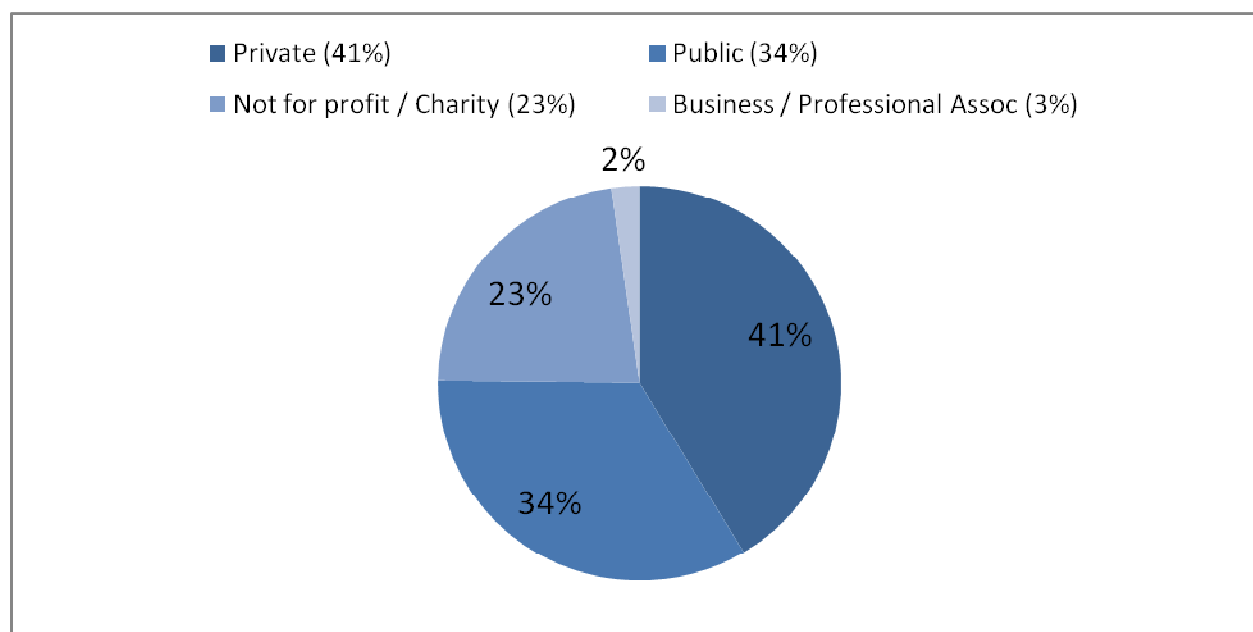
Table 14: Academics and their external contacts

School / Division	Sector				Total
	Private	Public Sector	Charity / Not for Profit	Business Association	
1) School of Engineering Sciences	4	2	1	2	9
2) School of Engineering Sciences	9	0	1	0	10
3) School of Law	1	0	0	0	1
4) NOC / School of Earth and Ocean Science	4	1	3	0	8
5) School of Geography	3	1	1	0	5
6) School of Engineering Sciences	0	0	0	0	0
7) School of Civil Engineering and the Environment	1	2	1	0	4
8) School of Humanities	0	3	0	0	3
9) School of Humanities	0	0	8	0	8
10) School of Humanities	0	4	2	0	6
11) School of Management	0	5	1	1	7
12) NOC / School of Earth and Ocean Science	2	2	2	0	6
13) School of Geography	2	6	2	0	10
14) School of Engineering Sciences	8	0	3	0	11
15) School of Engineering Sciences	1	0	0	0	1
16) ISVR	1	3	1	0	5
17) School of Chemistry	8	0	0	0	8
18) NOC / School of Earth and Ocean Science	4	6	1	0	11
19) NOC / School of Earth and Ocean Science	6	3	0	0	9

20) School of Humanities	1	2	1	0	4
21) NOC / School of Earth and Ocean Science	0	5	2	0	7
Total	55	45	30	3	133

Overall, as shown in Fig. 10, private companies make up 41% of the external contacts, the public sector represent 34% of the external partners and the not for profit sector 23%, while business and professional associations represent just 3%.

Figure 10: Sector of external partners



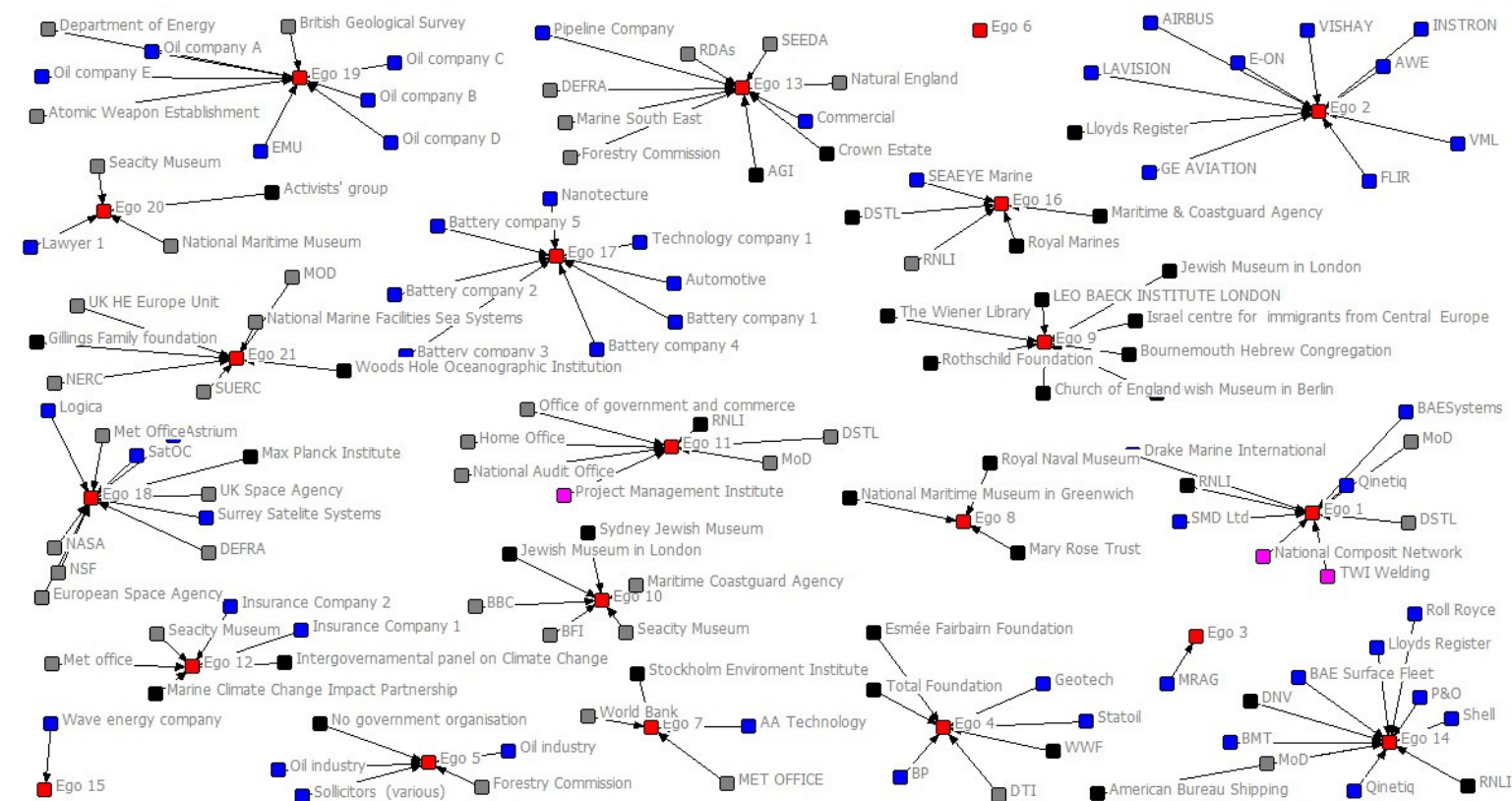
Different academics, specifically in relation to their research, identify different sectors and organisations as their relevant external partners. There is no judgement as to whether a public sector organisation is “better” to work with than a not for profit organisation. In relation to the specific field of the partner organisation, different advantages and disadvantages can be identified, so it is not always the case that the private sector is better or worse to work with.

Money is a big barrier at the moment, particular for small companies, they would love to throw some money at the project but they cannot do it at the moment (School of Engineering Sciences)

There are interesting opportunities here, it means we can tap into funding streams that we would not ordinarily be able to and vice versa, because they are a registered charity, and give us some flexibility (School of Humanities)

Figure 11 helps us visualise the range of contacts and external partners that the interviewee engages with. In particular, thanks to the colours which identify the sectors of the external partners, (education, public, private or not for profit) it is possible to see how certain individuals tend to interact with specific sectors (for example almost all the contacts of Ego 2 are private companies). However, in most case, the nodes (representing the academics interviewed) present a range of collaborations, including not-for-profit sector, public organisations etc. The only nodes belonging to the education/University sector (in red) are the individuals interviewed, as during the interviews they were asked to specified external contacts but outside the academic sphere.

Figure 11: Egonetworks and they connections by sector



	Education / University
	Not for profit / Charity
	Private sector
	Public sector

Geography of external engagement

The geographical dimension of these collaborations is also interesting (see fig. 13). Overall, 40% of the connections are local (the South of England) but this large percentage obviously includes London and other cities in the South, which being within easy reach, are well represented. As these respondents suggest the one-day commute distance does facilitate interactions.

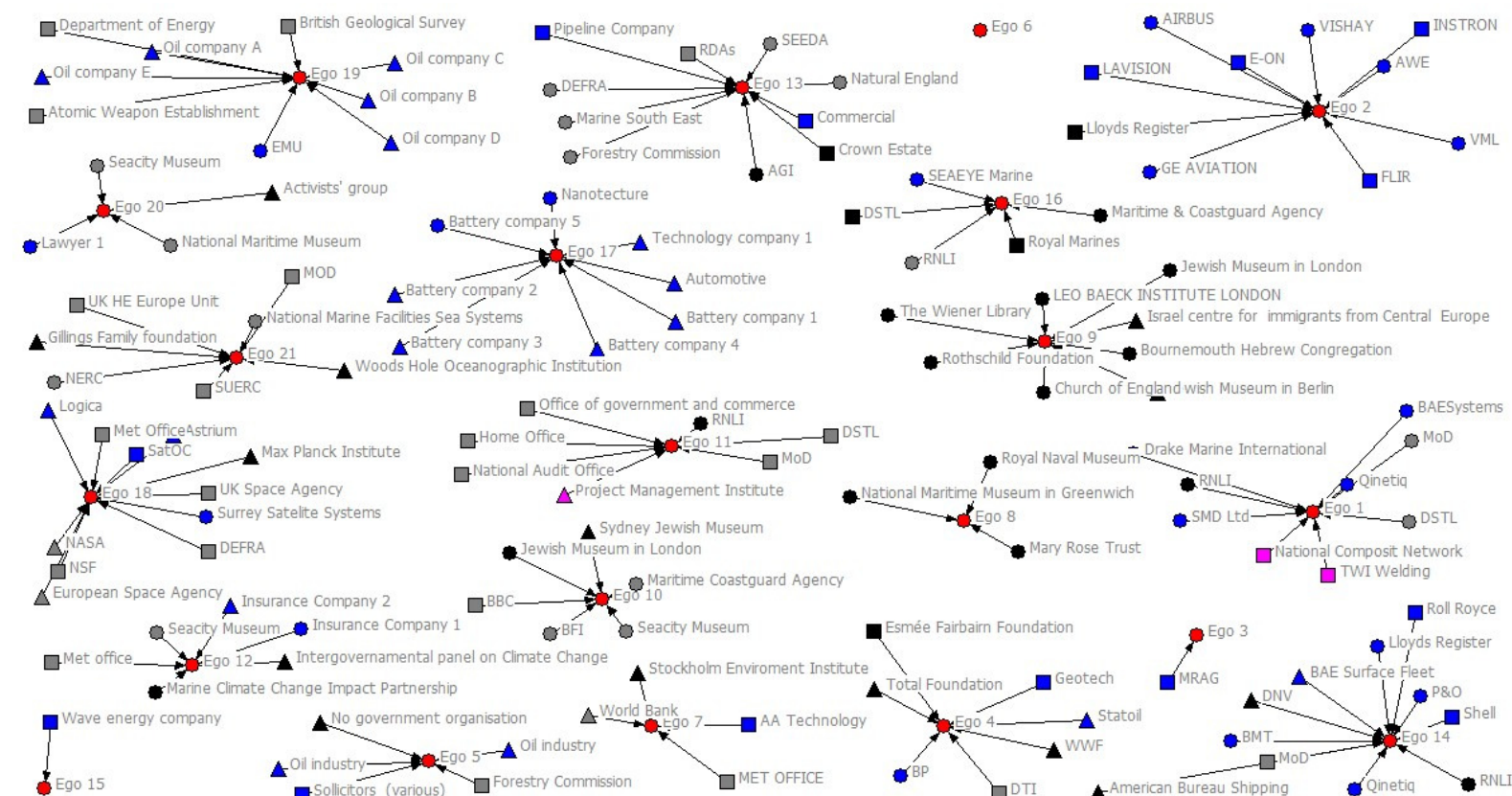
What is really helpful in generating collaboration is being close to people, but at the end of the day if they want to work with you, it does not matter where you are, but collaborations we had close by worked very well, within a one-day commute ... that is a big barrier to more collaboration internationally, you cannot go anywhere further than Brussels in one day (School of Engineering Sciences)

Some of them are local but geography is not the primary determinant, it is more about who the right partners are, and geography is becoming less of an issue with electronic communication, it is a geography of relation rather than a geography of space (School of Earth and Ocean Science)

However, overall, respondents underlined the importance of working with key players in their area of expertise and research and therefore distance was not considered important. Also in relation to the different context and scale of one's research, global issues or dynamics might in fact be more relevant than local ones. In general it was felt that Southampton did not provide specific resources (such as Regional funding) to tap into.

Southampton and the South East do not get enough funding to do anything meaningful, compared to the North of England and Scotland, so we work with some local companies but no big funding organisations (School of Chemistry)

Figure 12: Egonetworks and their connections by sector and geographical location



■	Education / University
■	Not for profit / Charity
■	Private sector
■	Public sector
○	South of England
□	Rest of UK
△	International

Some of the academics and Schools have local collaborations, but they are not a major part of their work.

*Personally the relation with Southampton is not strong, I work more with the USA, but as a school, our school board is chaired by the Head of the City Council, **so as a school we try to foster relationships with local businesses, we have 11 senior managers on our school board, some maritime like Carnival** (School of Management)*

There is quite a lot of activity within the South East and the Hampshire region, maybe 30% of our contracts, but the rest of our work is in the rest of UK and internationally as well (School of Engineering Sciences)

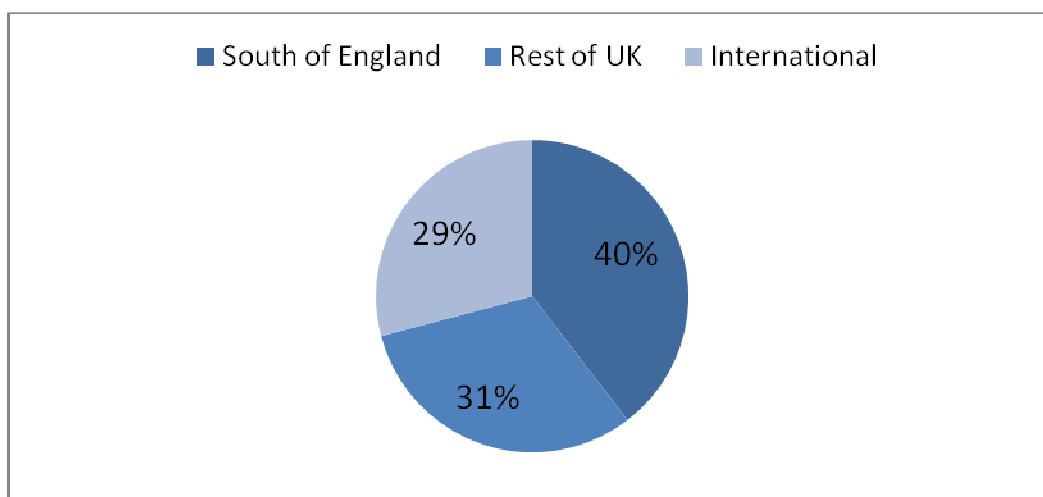
The role of Southampton (or the Hampshire area) was not considered particularly important for the respondents, although there was a feeling that it could have improved or was something worth considering further.

*They tend to have offices in the Southern Region but it does not mean it would be my main point of contact, it can be wherever, **I do not think Southampton makes such a difference**, although we work with local companies, our business is international (School of Engineering Sciences)*

*Contacts with Southampton is something we need to work on and links with local communities, **we have strong national and international links, but the local is something we do not pay much attention to** (School of Humanities)*

*I like talking to general audiences, I am motivated to try and improve the visibility of our research, **especially in Southampton, I do not think enough people in the city are aware of or sufficiently proud of this university, and we can do a better job in establishing our presence in public** (School of Ocean and Earth Science)*

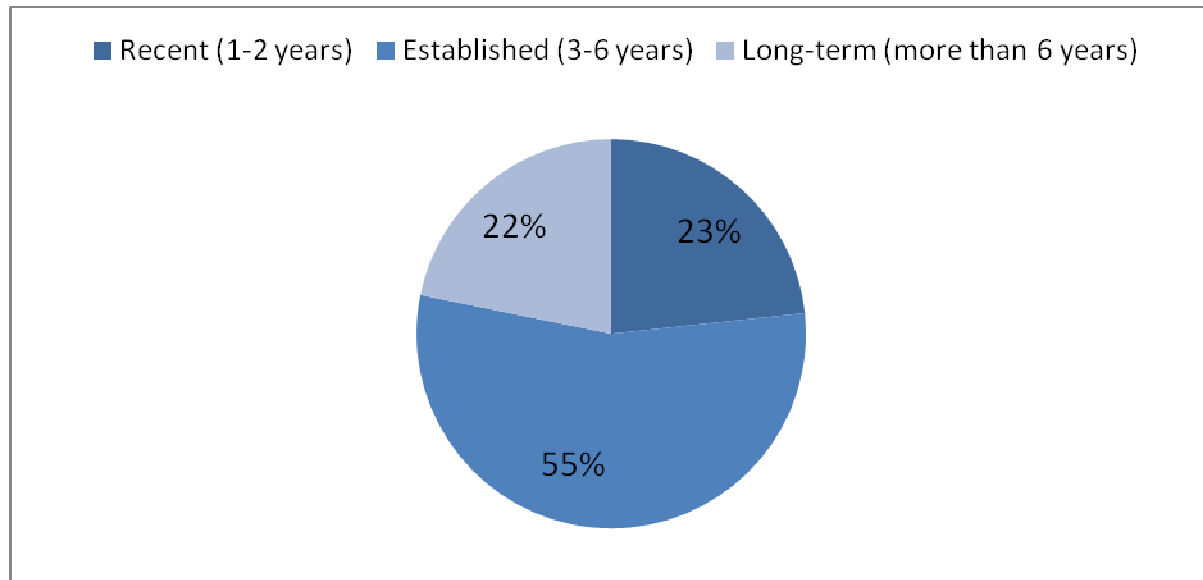
Figure 13: The geography of connections



Time and strength of the relationships

The responses show an interesting variety and mix, particularly when we consider the stage that the relationships are at with external partners. The majority of the relationships had been established for three to six years, but most of the respondents, alongside established and long-term relationships, were cultivating new contacts (see fig. 14).

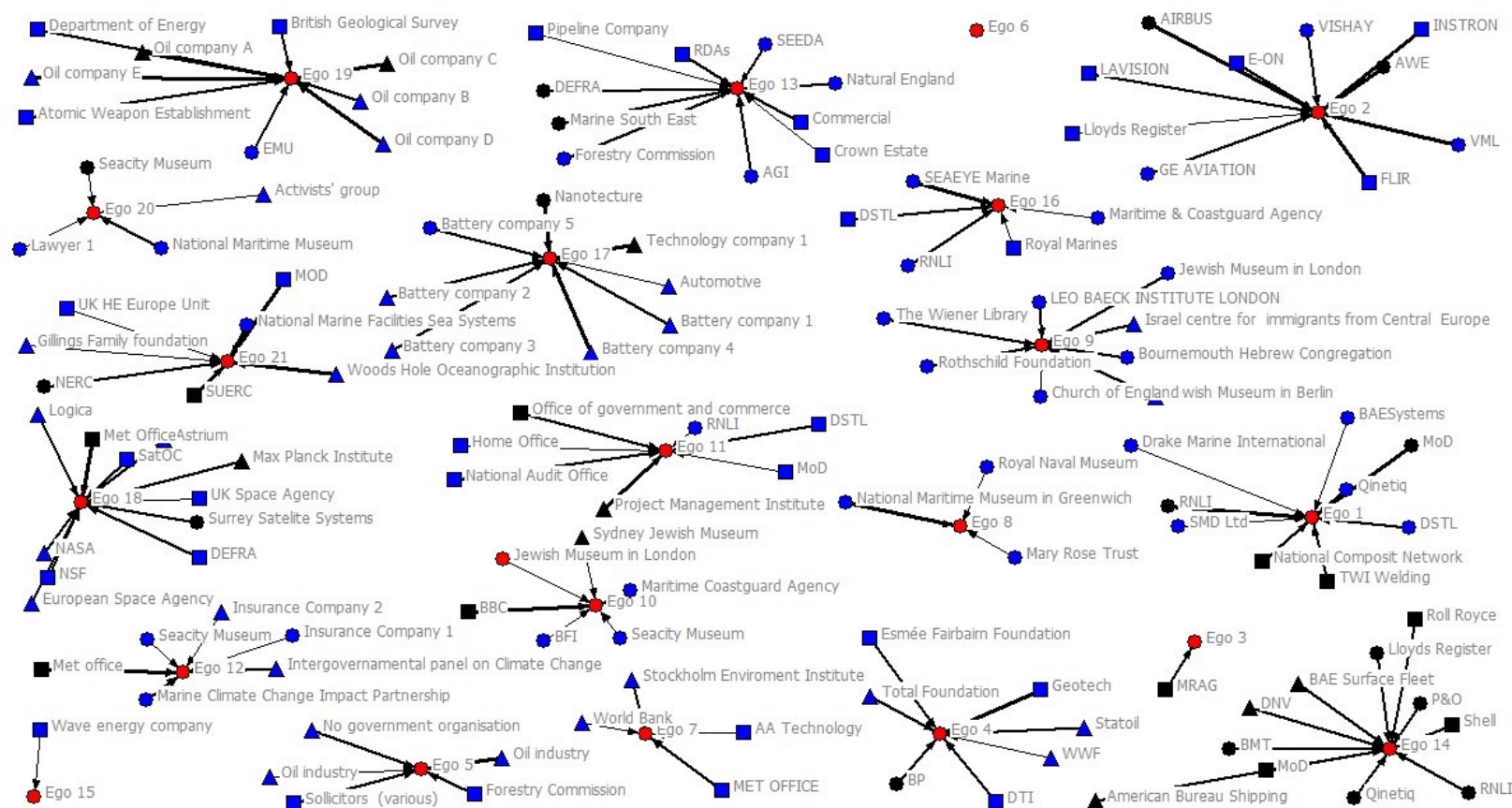
Figure 14: When was the relationship established?



In fact most of the respondents considered their contacts to be long-term contacts and even if recent, they considered them starting points of new long-term partners. There was very little evidence of using contacts for one-off projects or partnerships.

Once we get a client, we tend to work with them for a very long time; generally our relationship does not end, it might lie dormant for a few years, but we might get a phone call out of the blue and immediately pick up where we left off (School of Geography)

Figure 15: Egonetworks: professional and social relations and strength of ties



	Professional and social relation
	Professional relation only
→	The thickness of the line correspond to the length (in time) of the relation (recent, established, long-term)

While some people highlighted that a social dimension creates advantages in trust and exchanges with external partners, the social side is very 'personal', depending on personal affinity. It is not a prerogative, and in fact an added social dynamic is present in only 24% of the relationships.

***If it becomes a social relationship, it becomes a lot easier, and you move further into that trust relationship.** Some of the project management circles are quite social relationships, particularly with government types of people, particularly when you attend conferences you start to know people (School of Management)*

***Many of my contacts are built from former students because naval architecture is a very small discipline** (School of Engineering Sciences)*

***I get more out of the organisation because I like the people there; we have a professional and personal relation and the two balance each other very nicely.** You gain more from a relationship with an individual that is a personal one as well as a professional one (School of Humanities)*

*Whether the relation is also social, I do not think it depends on the organisation but the individual ... probably with policy makers I do not see them often enough to establish social relations ... **if you do have a social relation then it makes it easier to interact on any level, you know people better** (School of Earth and Ocean Science)*

Although a social dimension is not always present, there was a strong personal connection and an element of serendipity in the kind of relations that were established.

***The Max Planck Institute relationships was an accident of history, because a German guy that was working here moved to the institute so we might not have developed a relationship with them, but it is because this person was heavily involved** (School of Earth and Ocean Science)*

***It is like serendipity, I had a colleague and friend in Australia and told her I was coming to the end of a large project and mentioned I wanted to work on a large river...** she had a friend in this non-government commission and they contacted me so that came by personal recommendation (School of Geography)*

*A lot of these relations come by **word of mouth**, these people came and asked about submarines and this a new relationship, I just met this guy a month ago, but that's because he was sitting on a desk opposite a person I was working with twenty years ago, **so in a sense it is a new relation but it is also a twenty-year old relationship** (School of Management)*

Sometimes this is also informed by the career patterns of the academics involved, for example if they have had experience in industry

***I came from an engineering consultancy, which was a naval consultancy, so all my contacts are naval contacts, some of them are to do with logistics and project management** (School of Management)*

***The centre has 28 companies on its books, people who are funding work, that's driven by the vision of the academic involved, who was our previous director, it would be difficult to see something of that scale come off if he had not been involved in this enterprise - consultancy sort of activities, having companies, coming in and doing a variety of different work** (School of Engineering Sciences)*

In more than one case, this personal dimension allows academics to become 'brokers' of relations even outside their specific field of research

***I have contacts with the Maritime and Coastguard Agency and I have put them in contact with the Sea City project and hopefully they will be involved in that as well** (School of Humanities)*

***The Sea City Museum in Southampton ... I have introduced them to a travel writer, who will do some of their narratives ... this is more as a facilitator than a direct research interest** (School of Humanities)*

Modes of engagement

From the interviews it was clear that when talking about 'external engagement' it was not possible to have a single definition or single understanding and in fact all of the School and academics are aware that their external engagement develops via a variety of activities, contacts and modes of interactions

*There are all sorts of different ways, there is consultancy, using them as research partners, PhD students, MSc projects in the summer, knowledge transfer partnership ... **these are all different ways of collaborating, we have the whole spectrum of ways of collaborating** (School of Management)*

*We tend to work with everybody, large projects provide more contingency ... **but we work with the full range, because you never know where things would lead, often we have helped someone almost as an individual, and you do not realise that they work in a large organisation** and that leads to something much bigger, we try to help always everyone and that really pays off (School of Geography)*

***We work with companies, from people who have a handful of employees to multinational companies, from a couple of days work, to the largest contract of £250k run over a three-year period, the whole range** (School of Engineering Sciences)*

*We adapt to the financial model and infrastructure of each organisation, **we tend to be very flexible, and react to how each organisation type likes to work**, some organisations are very formal, others we are able to work with and roughly tell them how much it costs, with some others we have some service agreement sort of format (School of Geography)*

The multiple nature of these relations depends also on the role of the academics involved

*I have a number of roles, so the organisations with which I work under each role are different, I run the NERC Rapid Climate Change Program, I have my own personal research interests and I am co-chair of a research group, **so I get in contact with people for different reasons** (School of Earth and Ocean Science)*

*My interests are experimental mechanics and structural testing and I work with academics and I have had EPSRC grants, **so I cover some fundamental research aspects but my main activity is the applied research and consultancy** (School of Engineering Sciences)*

The modes seems to be also linked to the kind of subject and research academics are involved in, but not in a predetermined way

*At the School and Faculty level, we have to work together with industry, **it is engineering as a whole, needs to offer solution to a problem, we can say 'I have this solution technique, I am looking for a problem** (School of Engineering Sciences)*

*Often is only an exchange, but there are instances when they really need you because you are the expert and **they commission you to write a concept for an exhibition, in that case it can be paid work, but you won't get rich** (School of Humanities)*

*The reasons for collaborating depend on where you are in the spectrum, so if it is an MSc is just getting a contact, consulting may be about getting money ... **you cannot do business school research within the Business School, to do research you need to be out there, it is like our laboratory, the business world is our lab, we have to be out there**, even if it is a bit of consultancy which is not very interesting, as long as it helps to introduce us to interesting research data or an interesting problem, it gives a creative interest... the school is research-led and research is at the heart of the school (School of Management)*

Benefits of collaborating with external partners

Most of the respondents struggle to capture the single nature of their relationship with the external partner as in the majority of the cases, the relationships was a sum of different types of activities and exchanges (table 15).

In general terms, mostly people identified three main types of connections: a knowledge transfer / funding relations (often linked to a research project), a consultancy relation (more directed to provide a service to the external partner) and more general knowledge sharing / collaborative relation (often not linked to a specific contract but more to an exchange).

*With the MET office it is a partnership, we work with them in climate change, so they are putting their own resources into that, **so there is no exchange of funds, it is a collaboration** (School of Earth and Ocean Science)*

However, while these three categories provided a main framework for the relation, every relation had multiple benefits and dimensions, mostly including relations with teaching and student projects / placements, funding towards research students, small consultancy tasks or access to materials / data /equipment of the external partners.

Table 15: List of benefits mentioned

	Benefit 1	Benefit 2	Benefit 3
KT / Funding	49	3	2
Consultancy	22	18	4
Knowledge sharing / collaboration	36	10	8
Access to funding	13	3	1
PhD / Research student	4	12	7
Personal relationship	1	0	0
Influence Public policy	1	7	4
Co-founder / spin out	1	0	0
Materials / Archives / Data	2	21	5
Teaching / Student placements	1	22	9
Visiting academics / teaching companies	1	2	2
Networking	1	3	2
Access to technology / equipment	1	5	4
	133	106	48

This multiple nature of the relationships established was underlined by many interviewees.

***It is only a consultancy but we have plans to talk about maybe supporting UG student projects, they are also involved in the business advisory board for one of our EPSRC contracts and this is because of the consultancy relationships** (School of Engineering Sciences)*

***We have lots of alumni in the carbon industry and mining industry and we try to bring their expertise into our education programme as visiting lectures and they do fund certain aspects of our education programme and they hire our graduates ... sometimes they contribute with datasets to our master programmes** (School of Earth and Ocean Science)*

Many respondents did see their external engagement activities closely linked with their teaching practice and benefiting the experience offered to students

*It is officially a consultancy relationship ... but as a visiting academic he also talks to our students so he provides industrial insights in some aspects of the structures of submarines ... **this educational provision of knowledge to our students is quite unique** (School of Engineering Sciences)*

*The benefits are varied ... giving a public lecture sometimes ... what is interesting is the kind of questions you get asked ... **it makes you question the assumptions that you are making** ... and that's very good for teaching (School of Humanities)*

*For UG teaching I feed pictures and **examples from my consultancy into my lectures so the students can see a practical link with the work you are doing**, it is important for their perception of you as individual and their own perception of what they might do as a career, you are not just an academic interested in rivers you are helping society by managing rivers, and they think 'I could go into river consultancy' (School of Geography)*

***For our students we have an opportunity through these links**, so they can also speak to museum staff (School of Humanities)*

*There is a feed through to masters teaching, **when I lecture on things like observation, telling my students about the latest techniques, telling them about things that are coming out from our meeting ESA, NASA and also development project with companies**, where we look at the users and they implement the technologies and applications (School of Earth and Ocean Science)*

Many of the respondents saw collaboration with external partners as essential to their work and strongly recognised the value and expertise of those external partners

*The relationship is two way because we do not have ships, and we want information about ships, we need research and operational information for our research, it has to be, **they bring valuable knowledge** (School of Engineering Sciences)*

*We see it as co-production of knowledge, so things we could not do on our own ... the people we like to talk to are 'reflective practitioners' who do the job and think about it... we join up with them and we can do something together, **so it is co-production of knowledge, a lot of things we do, we could not do on our own, industry could not do on their own but you put us together and we can** (School of Management)*

In particular, external engagement was a driver for motivation and many respondents were doing it mainly because it was something interesting and challenging in relation to their research.

*And in terms of the museum it helps publish our work, to make it known to the public – for an historian you sit in an archive, you deal with sources and then you write it up but to have the possibility to show it in an exhibition and show it with pieces of artefacts, **it is much more attractive than just an article in a journal** (School of Humanities)*

The engagement with external partners also enables people to test the relevance and value of their work in the real world

***Businesses put a value on what that knowledge is**, they have a role in helping us define the kind of impact of our research work (School of Engineering Sciences)*

*I find the advisory boards in big projects very useful, **they will keep your feet anchored to the ground** ... asking simple practical questions 'how can you use it on this boat', simple practical problems, to actually make a difference to these people (Institute of Sound and Vibration Research)*

Funding

Funding is considered a major driver of external engagement, sometimes industry seems to be the only viable partner in supporting a specific kind of research. There was also a push

towards a diversification of funding sources, driven by the economic climate and policy change, where external engagement seemed to become more important

*Engaging with external organisations is going to become more important in the future than it was in the past, it is clear that funding from government is going to decline, and **our efforts needs to be directed elsewhere and we might have to change our behaviour in order to achieve that*** (School of Earth and Ocean Science)

*Motivation is usually doing something interesting and wanting to work with someone, but we also have **funding drivers as we have staff and want to pay their salary and keep them working**, so the primary driver is interesting science, the second is to bring in money* (School of Earth and Ocean Science)

***Funding is a major motivation** but it helps also me and my colleagues to appreciate the employment sectors that our graduates will hopefully enter* (School of Earth and Ocean Science)

*Our activity is not just about income generation, it is support of research activities, **we might be able to see a business case and make a lot of money, but if it is not tied in with the research and education, it has only got a short-term life and no long-term benefit*** (School of Engineering Sciences)

Responding to the impact agenda

Another important dimension, considered key both by academics in science and humanities is the new importance of external engagement to support grant applications to research councils. The importance of showing 'impact' makes these external relations very important towards receiving large grants.

*For the AHRC everything you do needs to have an impact, **an impact means a bit more than turning the wheel of academia, impact can be understood as reaching out, reaching different people that you do not reach with academic work*** (School of Humanities)

*Each time I have to write a proposal, I need to write an impact plan, and I am happy to write in it a similar kind of venture, that we could develop through a long-term collaboration with the Sea City museum ... **there is a long-term opportunity to rotate exhibits at the museum to show off our research*** (School of Ocean and Earth Science)

*The scientific knowledge is one way, from us to them, but the industrial knowledge is the other way. They tell us what is required and if what we are doing is relevant to what they need, **they offer to work with our discoveries, so showing the sponsors (like the EC) that what we are doing is worthwhile*** (School of Chemistry)

And even for academic who does not engage with companies, this is recognised as an obstacle for them to try and access funding.

My work is kind of theoretical so it is not easy to work with companies ... of course it is important especially for EPSRC proposals that usually ask for industrial support and that's a problem for me (School of Engineering Sciences)

*Engagement is going to become more important for the university, with Engineering and Sciences there is not a massive amount of blue sky research done, lots of the fundamental research is kind of applied, offering solutions to real life problems so there is always going to be a fair amount of industrial engagement, they will know of companies that lead in the technologies they are interested in, **but it is more important in demonstrating the impact of research, because companies using***

knowledge that is generated in the university is the best example of that (School of Engineering Sciences)

The impact agenda is closely intertwined with the need to reach out to different audiences, whether in the community, the economy or in public policy

*The relationship with the Sea City museum is a small partnership but if that works out well, I am interested in exploring **how I can increase the presence of my research in the local community** ... we will provide display materials and develop them in partnership* (School of Ocean and Earth Science)

*By having contact with these kinds of people, it enables us to tap into what it is that industry really want, making sure the research we do is industrially relevant, if you do too much research which is too much blue sky or behind closed doors you can do research activities for nothing, **the outputs of the research can be valuable to the UK economy in the future*** (School of Engineering Sciences)

*Outreach is very important for us [...] it is important for us to inform the public of what we are doing, because it is more than academic, **it has a societal and political dimension to influence public policy*** (School of Humanities)

*There is a sense of pride working with public sector organisations, we do things in a very standard-compliance, value for money, very cost-effective manner, **so it gives us a feel good factor to know that you are delivering those philosophies within a public sector*** (School of Geography)

The personal motivation behind external engagement

Although many academics described a variety of benefits to engage with external partners, there were quite a few motivations which were personal and linked to career dynamics and the future of the respondents, and this was particularly true in the case of younger members of staff

*The things I do, I do them because I want to do them, they are part of my job, but it is not motivated by someone else, is not that my ambition leads me to do things I do just for doing them, there needs to be a personal interest in it for me ... **it is personal motivation, it has a long-term career goal ... but it needs to all connect, it needs to have a personal motivation beyond simply the sake of 'I am doing this because it is my job'*** (School of Humanities)

*The motivation for engaging is **writing better research papers and improving my teaching** ... a research paper I published recently was very much informed by the discussion I was having with lawyers working on a case* (School of Humanities)

Sometimes this engagement is seen in strategic terms, for the career development and opportunity of the academic, or to remain in a current post.

*From a selfish point of view, having this network of people that I built up over the years allows me to continue the relationship in the hope we do good research with them and **they will support bids for research council money or government money or from elsewhere to further my career** ... some of the contacts are my own, that I fostered on my own, they are important to me, **they will help me secure my future ability to get industrial support for my research council funding*** (School of Engineering Sciences)

*It is a worthwhile institute to get close to, the materials they want to archive ... my aim is to nurture the relationship so that I have a PhD student working there at some point in the future ... **I am thinking long-term, thinking how it would help to construct a relationship that would help me and my colleagues ... I am early-career so I am doing this in small steps.*** (School of Humanities)

*It is impossible these days to have an academic career without linking with industry, in the latest review of the department, **if it was not for my industrial***

collaborations and the support I was getting from that network, I would have been made redundant ... if you do not get money in, you get fired... It has made me focus much more on developments that bring money in and into leaving anything else (School of Chemistry)

The importance of networking

Many respondents highlighted the importance of networking or keeping informed and be part of activities that can provide further opportunities.

*They organise meeting of people who have like-minded ideas on how to drive research forward ... **They are the conduit through which we make further industrial contact** ... they organise seminars and workshops to aid those relationships (School of Engineering Sciences)*

*I try and act, I'd rather be involved and find out that is not really my thing, rather than not being involved and wish I had done that, **networking is also valuable** (School of Humanities)*

Establishing new contacts seems to be a very time consuming investment.

*I went to a 'Christmas Seminar' that led to a visit last summer, we managed to progress a relationship with them and talk also to another insurance company about ways in which our research can improve our ability to predict hurricanes, **in both cases I have been quite pro-active, it took so far a year and half to get to this point and we are optimistic that sometimes in the future they would invest in our research** (School of Earth and Ocean Science)*

However, many also highlighted the demanding tasks of keeping up with their network and contacts and the importance of maintaining the networks and connections alive.

***Most of these people I see once a month**, through project meetings, or meeting somewhere for other issues we are involved in together (School of Engineering Sciences)*

*I try to provide an excellent service so they will come back to me. **I try to maintain contact with the same people and every few months send an e-mail** saying "is there anything I can do for you"- "would you like to discuss a studentship", every year I contact them to make sure they remember me even if I am sure they might not have any money (School of Geography)*

*The problem is we are fairly static here, with fairly permanent positions, we look at things long-term there they get promoted or move sideways, you call after six months you are not talking to the guy you built the relationship **with so that's why we went down there ... you need to be building up the relationship all the time so you have a gateway to the company** (Institute of Sound and Vibration Research)*
*Funding is diverse, so you need a lot of relationships with different people for different reason, **sustaining them is a time issue and a problem sometimes** (School of Ocean and Earth Science)*

Time is often considered a barrier here and also maintaining stable contacts in very volatile working environments and project-based work is difficult.

*Main barrier is time, if you have been working with someone a long time and you need to write a bid it is straight forward, **but if you have not worked with anyone before, it takes time to build a relationship** (School of Ocean and Earth Science)*

*We have a weak link with DEFRA, because the person involved kept changing every 6 months, so over 3 years we have 4-5 different people, **we never established a very good relationship but we worked hard on that, I seconded one of my staff to spend time, not long, there to get to know people and find out what they wanted, what kind of information they as policy-makers find useful** (School of Earth and Ocean Science)*

Developing CPD

Continuing Professional Development was not very high in the agenda of external engagement. It often felt like it could be an opportunity for some disciplines, but was not fully explored for a variety of reasons, including time and commitments.

*Long-term we see this as opportunity for UG but we are starting to see the research side of it, we would like to work closer with the Museum at the level of MA modules. They could provide input to a new MA programme but these are difficult things to negotiate; we are thinking of developing more opportunities so that we can deliver ourselves courses in maritime study, which would increase our research-base. **It is again about timeframes, we need to be mindful about the fact that it might take some time** (School of Humanities)*

*CPD ... we have very little, although we are trying to develop it, I am not sure if it is because ... we are just not good at marketing or the way you package it ... we have changed now the way we deliver PG courses, so you can just take one module for one week, which becomes a one-week short course... **we have the knowledge, we are just not good in showing we have that knowledge** ... we are trying to spread the message and have evening seminars (School of Management)*

During the interviews successful examples have been mentioned of integration between CPD and external engagement, but the impression was that the university struggles to provide relevant opportunities and materials for specialised markets.

*In the 80s we ran courses and we would get engineers from oil companies and they were successful; we run short courses, now we occasionally have people coming, but **it is not very common and there is not a very big market to tap into**. What we are teaching is too broad ... they are not tailored to specific markets, if you have a government regulation that the company needs to meet, then you can do that, but otherwise it is too generic (School of Earth and Ocean Science)*

*The Summer School is a form of CPD, run by the Electro-chemistry section, seven or eight academics, we run the course in a week and we receive about 30 people from industry who pay around one thousand pounds each, **it has been going on for 30 years and it generates further industrial contacts** (School of Chemistry)*

Barriers

Some infrastructural difficulties were mentioned, specifically in the way financial and legal issues are address within the university.

*Within the university there is a **lot of rigidity and inflexibility in the way the university runs, that sometimes make doing enterprise activities very difficult** and that's a serious problem for the university to deliver on that agenda, for example the way finance operates ... like having to close all accounts at the end of the year (School of Geography)*

***It is difficult to set up contracts within the university, getting stuff through legal issues, they got lots better** ... if you go to a consultancy company and you want a job done, they can snap their fingers, and have three consultants there that day working for three months, we cannot always to this, if you come and ask us for a consultancy in May we need to say, it is exam time you have to wait (School of Management)*

On the other hand, some mentioned that the university provides an open approach to engagement, not forcing or constraining activities.

There are benefits from being at the university, we are seen to be independent, we can charge what we like, we can charge a small sum, if we think it is something

very interesting, we do consulting for fees that consultancy would not want to do, because we might get a good paper out of it (School of Management)

*I never let the way the university operates stop me from doing anything, it is irrelevant how we get money or making our contacts, **the university is neutral in many ways, neither a help or a hindrance...gives academics a great deal of freedom** ... which I think helps as you would not want the university to facilitate that, it is up to the individual, is not for the university to say you must meet so and so, it up to the individual (School of Engineering Sciences)*

Overall, interviewees find it difficult to identify specific barriers to engagement.

*I do not see any barrier, we get good support from Research and Innovation Services in dealing with specific issues ... there is always been a solution, **I cannot think of any project that has not happened because we could not agree on T&Cs** (School of Engineering Sciences)*

*There are no real barriers from the outside, our involvement with external organisations is always welcomed and very positive, **never had a negative reaction to the fact that we come from the university** (School of Geography)*

Time was seen as the major issue preventing more engagement taking place.

***Principal barrier is time**, time constraints can be severe, especially in the teaching year but apart from that there are no specific barriers to developing relationships and becoming more networked in the community (School of Earth and Ocean Science)*

***The main barrier is time**, but as a School we have not been able to do too much and we do not have a champion of it, finding the human resources is the challenge, we have many contacts with industry but **we have not got ourselves together to be more coherent in our approach with industry** (School of Earth and Ocean Science)*

Another issue mentioned was the financial pressure and difficulties created by the recession.

*It is difficult for industry when there is a recession to be putting resources into an academic project, that may make collaboration for some companies difficult – not the long established – but starting up and relationship building is a long-term commitment and **in the recession it might seem very difficult to start new projects** (Institute of Sound and Vibration Research)*

Another important issue mentioned, that complicates the relations between academia and industry is the different timescales that they adopt.

*We are not really oriented towards business ... the fundamental difference between university and industry is that they are in research “and development” but we are in research, the university has been pushing on spin-out, there are going to be very few areas where we can develop spin out ... **but I still feel we’ve got a totally different horizon than industry, they want solutions now, we want problems that take three – six years to try and find an answer** (Institute of Sound and Vibration Research)*

*After the formal link, we had a series of meetings but now it is more informal contacts, but you have to keep maintaining the contact ... you have to keep ringing them to say, “I am still here, I am going to be down soon”, it is all from our side ... you have to keep in touch, we need data, they need solutions, but also we need access to them, we work very hard to keep these links going, is not a easy thing to do ... **things like an approval from Safety & Ethics might take four months, if you are out there in industry, you have not concept of why a procedure like that might take so long ... sometimes it is difficult for industry to understand how the university operates, and why a procedure like that should take so long** (Institute of Sound and Vibration Research)*

Some academics felt that there are no real barriers but that sometimes perception can play a role against academia.

*People have a totally wrong view of academics sometimes, with no industrial experience ... we need to get the message that we are active as well, we work in the real world ... **they think we teach students all the time ...they do not know that the main part of my work is about research** ... we do not tell people enough about it (Institute of Sound and Vibration Research)*

*To some industries they still sees us as the next stage after school, they have not quite realised we are a research institute, but **once you have broken that misconception down and they see the facilities and the knowledge we have and when we can demonstrate some of our research output they are very willing to collaborate**, but you have to break that misconception down (School of Engineering Science)*

Conclusions and Recommendations

The analysis of qualitative interviews and social network analysis data has provided many insights into internal collaborations and external engagement in the Maritime Studies USRG at the University of Southampton. It is important to consider how these findings help us not only to describe processes and experiences but also to inform future activities and indicate how these can be supported and developed further. In the following paragraphs, we explore the main findings of the research and link these to possible actions and recommendations, however, some issues raised here might benefit from further research and consultation. In particular, bearing in mind the original aims of this report, we want to highlight the findings relevant to the three key questions below.

1. How can the institution best coordinate, support and maximise the benefit from our engagement with employers?

The findings from our qualitative interviews suggest that external engagement is strongly linked to personal and career motivations; the academics interviewed showed a strong level of engagement with external partners. Whether working with industry, or influencing public policy, or engaging different audiences, making an impact in the real world and the challenges that this presents, is seen as the main reason for engaging. Lack of motivation does not seem an issue and the University helps to channel and support that motivation.

The academics highlighted a variety of different benefits to themselves and others from external interactions. These ranged from the very practical (access to data or technology) to rather more intangible benefits, for the local community, or enhancing the University's reputation. When working with external partners, academics understand that they are engaging in an evolving relationship, often multi-purpose, often overlapping with their teaching and research agenda and often long-term. Therefore, benefits are also put into this long-term perspective, with only small short-term benefits, but possibly greater long-term rewards. It may take a number of years to reap major reward, and there may be secondary benefits (such as guest lectures, students placements etc) which have low financial value but have broad and important impact on the institution. This degree of flexibility (and long-term investment) is managed by the single academic and often – unless there is a contract or income generated – it is not "always known, measured or indeed fully recognised by the School and University.

Recommendations

Promote diversity of external engagement practices: the interviews highlighted a broad range of external engagement practice: not only contracts and consultancy, but also for example guest lecturing, MSc projects and others. The University should raise awareness of this range of practices and celebrate external engagement more broadly, not only in relation to big contractual agreements. The development of case studies which highlight this range of collaboration could improve the overall understanding of external engagement at the University and enable learning from good practice across the institution. More routine contact with external organisations at a variety of levels should also improve understanding of the University and its business and potential as a collaborative partner.

Valuing inter-disciplinary research: while many appreciated the opportunity to understand better the range of research activities taking place, the value of interdisciplinarity could also be promoted further by the USRG, even if simply presenting some of the interdisciplinary work already taking place at the University. This would reinforce the value of having networks like the USRG at the University and provide a basis for further interdisciplinary collaborations.

Involving more Early Career Researchers (ECRs) in the USRG: Younger members of staff represent less than 10% of the USRG (according to our sample of respondents). The USRG might need to have a specific strategy to fully engage the early career academics. This could

improve the career development for the ECRs and also capitalise fully on research and other expertise within the USRG. For instance, having a younger member of staff representing ECRs on the USRG board could enable a more representative view of the issues that Maritime Studies face in Southampton.

2. How the university can best enhance its research agenda and add value to existing collaborations, including CPD opportunities

The interviewees frequently cited lack of time as a barrier to their external engagement - meaning it is difficult to take on a potentially time intensive activity in addition to teaching, research and administrative activities. However, they also felt that help or support was limited or lacking to facilitate this engagement. In particular, younger members of staff highlighted the steep learning curve needed to build relations and the know-how to deal with external organisations.

Most of the interviewees saw in the USRG a potential platform to support external engagement (alongside internal collaboration). While senior academics seemed to place limited value on the USRG, as they have enough experience to engage directly with other academics and external partners, younger members of staff saw in the USRG the possibility of acquiring a greater awareness of the knowledge-base in Maritime Studies within the University. They also saw the USRG as a platform to create opportunities to interact with the outside but also to learn the know-how of external engagement.

The SNA has shown that the USRG has been successful in creating awareness amongst academics but also a platform for dialogue across Schools and Faculties. However, many highlighted the need for the USRG to become more relevant in presenting Maritime Studies to the outside and also to coordinate activities which could be relevant across Schools. In particular, a few interviewees mentioned that the USRG could play a stronger role in coordinating the University of Southampton presence and collaboration with the Sea City Museum.

Recommendations

Growing the external engagement expertise of academics: Whether junior or senior, the level of academic expertise and confidence towards external engagement is varied across the USRG. It would be useful, to create a means to facilitate knowledge sharing in relation to external engagement. The documentation and sharing of case studies of external engagement may help, as would inviting ECRs to shadow experienced staff at meetings and business activities, whether those staff are immediate colleagues or experienced colleagues from another area (e.g. Research and Innovation Services or another School).

Increase the University profile and engagement with the city: from the interviews, it was clear that Southampton and its surroundings did not play a significant role in external engagement activities. While this might be a result of a lack of opportunity or of local partners, there was a common view from interviewees that this could be improved and that this might influence the capacity of the University to interact with the city when the opportunity arises. The development of the Sea City Museum in Southampton could become a means to explore external engagement, outreach and the civic role of the University and should be taken forward by key university representatives as such an opportunity.

Increase discussion and knowledge sharing about CPD opportunities and their impact: only some interviewees were aware of the potential of CPD development, but many did not consider CPD development as part of their role. An increased awareness of the practices and potential of CPD should be promoted, perhaps as a means to add value to existing relationships. As noted earlier, CPD here is used in the broadest sense, to include M level provision. Notably, CPD requires flexible delivery (for non- traditional university students) and this would require different skills and competencies to support, so it would be

appropriate for discussions to take place at School or Faculty level, about potential opportunities and the implications this has for academic practice.

3. To identify the appropriate support structures and procedures to facilitate employer responsive provision, including means of delivery

Most of the interviewees were satisfied with the role that the USRG had played in making them aware of others' research within the University and further opportunities to showcase their work. However, many saw more potential and opportunities for the USRG to fulfil both in respect to knowledge sharing (and as mentioned the professional development of younger members of staff) and external engagement. In particular the opportunity for the USRG to become not only a vehicle to promote the Maritime Studies within the University and externally but also a platform to provide better opportunities – created by mixing and tailoring a variety of experts and facilities – for engaging with employers and public policy organisations.

Some interviewees perceived that there were occasions when internal procedures or structures made external engagement more problematic, even if the political will was present to encourage it. For instance, financial and legal procedures were mentioned specifically. The University as a whole, it was noted, was not generally in a position to seek fast solutions to problems, whereas the private sector often is. Additionally, certain aspects of institutional infrastructure further hinder external engagement. For instance, the speed of reaction to requests was observed to have been hampered by the time taken to draft and finalise contracts and agreements. The broader issue of a lack of understanding of the University business and its range of potential collaborations is also relevant here.

Recommendations

Creating time for external engagement and a reward system. If the University supports external engagement for a variety of reasons, including greater impact for research and CPD opportunities, then there needs to be both a strategic commitment and a reward system to encourage this. The current Education Strategic Plan highlights a commitment to engagement but there needs to be a means to ensure that academics have both the opportunity (time) and motivation (beyond personal) to ensure that this takes place.

More efficient knowledge sharing platforms: While the USRG has created valuable interactions and awareness across Schools and divisions, it is clear from the SNA that knowledge travels through very specific structures and key nodes within Schools. A more flexible and open platform may benefit the USRG to allow knowledge to reach more peripheral nodes and also to ensure the periphery can feed valuable information to the core. A platform for exchange (also creating continuity over time) could be a blog or a bi-monthly newsletter, where members can update others on their project / progress, where grant opportunities (or opportunities to engage) can be advertised and seminars or other academics can be promoted. This would create also a sense of 'continuity' over time, as many felt that the USRG was coming together only in specific occasions (such as the launch event).

Research and Innovation Services and USRG structure: in considering the results of the SNA and interviews here, there seems to be a degree of incongruence between the USRG structure and the Research and Innovation Services. While the School of Engineering Sciences enjoys strong connections with key members of the Research and Innovation Services, other Schools, such as the School of Humanities, are not part of the same framework (as other members of Research and Innovation Services interact more directly with the School of Humanities). This might not be a real barrier but the opportunity to develop multi-disciplinary projects might be restricted by the need for different people within Research and Innovation Services to make sure the Maritime Studies initiatives are considered interdisciplinary. The possibility to have someone in Research and Innovation Services overlooking 'Maritime Studies', from a multi-disciplinary perspective, could enable

more connections to be created across faculties.

Improvement of services and facilities towards professional audiences: Some highlighted the lack of facilities and services supporting external engagement and CPD. In particular, areas of the university where employer engagement was taking place commented on the lack of catering / conferencing facilities or parking, but also how the services on campus – specifically tailored towards students – did not facilitate professional interactions. The EEI has associated funds which are being dedicated to develop some spaces as high quality training and meeting space, but more work needs to be done to ensure that all additional services are high-quality, including the public-facing administrative systems. This is part of the greater issue of need for better communication and increased communication with external partners, to improve mutual understanding.

Future and further research

The research has revealed a diversity of activity and approach to collaboration both internally and externally within the Maritime Studies USRG. The study has documented these relationships in a way which allows us to learn from the structure and see opportunities for change and development. The recommendations above are just some of those opportunities.

In general, there was a clear acknowledgment that any means (or strategy) to interconnect academics (and their different expertises) and promote the profile of the University was appreciated. There was often the assumption that there is not enough awareness across Faculties and Schools, as well as Professional Services, of what is going on within the University and how certain types of work or projects could be shared and improved by knowledge-sharing. A better understanding of knowledge and professional networks within the University should be encouraged as it creates coherence and critical mass when the University is presented in external contexts. In order to engage effectively and efficiently with external partners it is important to have a clear picture of strength, connections and possibilities offered by academics and their knowledge and professional networks. It may be helpful to develop some infographics that visually represent the links that academics and academic teams have, as a communications tool to broaden and deepen everyone's understanding of the actuality and potential of our academic community in the wider community.

Additionally the methodology used here is one which can be applied to a variety of networks or groups. This is particularly important in areas where we depend (as we increasingly do) on informal networks and relations. Research is clearly an area where this is the case, as academics frequently build relationships which relate to their own academic profile rather than as a result of external drivers. In the University of Southampton there are a variety of other areas where we could use social network analysis to identify how informal networks which support the strategic aims of the University function, and how they may be developed and improved. For instance, there is a wealth of roles at academic and institutional level which have an employer engagement component – such as industrial liaison officers, employability officers, careers staff and so on. The research methodology could provide a means to discuss the network, roles and relations, and provide a valuable basis for strategic development.

Appendix Documents

Appendix 1 – Members of the Maritime Studies USRG

Members	School / Division affiliation
Dr Dragana Nikolic	Institute of Sound and Vibration Research
Prof Robert Allen	Institute of Sound and Vibration Research
Prof Michael Brennan	Institute of Sound and Vibration Research
Mr Richard Collier	Institute of Sound and Vibration Research
Prof Victor Humphrey	Institute of Sound and Vibration Research
Prof Timothy Leighton	Institute of Sound and Vibration Research
Dr Christopher Lewis	Institute of Sound and Vibration Research
Mr Matthew Parker	Institute of Sound and Vibration Research
Mr Malcolm Smith	Institute of Sound and Vibration Research
Prof Steve Elliott	Institute of Sound and Vibration Research
Mr Mike Douglas	National Oceanography Centre
Dr Maarten Furlong	National Oceanography Centre
Mr Steve Hall	National Oceanography Centre
Dr David Lewis	National Oceanography Centre
Mr Steve McPhail	National Oceanography Centre
Dr Matt Mowlem	National Oceanography Centre
Mr Roland Rogers	National Oceanography Centre
Mr Kevin Saw	National Oceanography Centre
Mr Peter Stevenson	National Oceanography Centre
Ms Jacky Wood	National Oceanography Centre
Prof Edward Hill	National Oceanography Centre
Prof Gwyn Griffiths	National Oceanography Centre / School of Engineering Sciences
Prof Carl Amos	National Oceanography Centre / School of Ocean and Earth Science
Dr Justin Dix	National Oceanography Centre / School of Ocean and Earth Science
Dr Neil Wells	National Oceanography Centre / School of Ocean and Earth Science
Dr Brian Bett	National Oceanography Centre / School of Ocean and Earth Science
Dr David Billett	National Oceanography Centre / School of Ocean and Earth Science
Dr Steve Boswell	National Oceanography Centre / School of Ocean and Earth Science
Prof Harry Bryden	National Oceanography Centre / School of Ocean and Earth Science
Dr Rachel Mills	National Oceanography Centre / School of Ocean and Earth Science
Prof John Bull	National Oceanography Centre / School of Ocean and Earth Science
Dr Valborg Byfield	National Oceanography Centre / School of Ocean and Earth Science
Mr Rob Curry	National Oceanography Centre / School of Ocean and Earth Science
Mr Alan Evans	National Oceanography Centre / School of Ocean and Earth Science
Dr David Hydes	National Oceanography Centre / School of Ocean and Earth Science
Mr Colin Jacobs	National Oceanography Centre / School of Ocean and Earth Science
Dr Boris Kelly-Gerrey	National Oceanography Centre / School of Ocean and Earth Science
Mr Peter Hunter	National Oceanography Centre / School of Ocean and Earth Science
Prof Richard Lampitt	National Oceanography Centre / School of Ocean and Earth Science
Dr Robert Marsh	National Oceanography Centre / School of Ocean and Earth Science
Prof Tim Minshull	National Oceanography Centre / School of Ocean and Earth Science

Prof Lindsay Parsons	National Oceanography Centre / School of Ocean and Earth Science
Prof Meric Srokosz	National Oceanography Centre / School of Ocean and Earth Science
Prof Andrew Roberts	National Oceanography Centre / School of Ocean and Earth Science
Dr Charlie Thompson	National Oceanography Centre / School of Ocean and Earth Science
Dr Peter Talling	National Oceanography Centre / School of Ocean and Earth Science
Dr Michael Tsimplis	National Oceanography Centre / School of Ocean and Earth Science
Prof Ian Wright	National Oceanography Centre / School of Ocean and Earth Science
Robin Axford	Research & Innovation Services
Kevin Forshaw	Research & Innovation Services
Hilary Smith	Research & Innovation Services
Dr Tony Raven	Research & Innovation Services
Don Spalinger	Research and Innovation Services / Director of Corporate Relationships
Prof Bill Keevil	School of Biological Sciences
Prof David Harrowven	School of Chemistry
Prof John Evans	School of Chemistry
Prof John Owen	School of Chemistry
Prof. AbuBakr Bahaj	School of Civil Engineering and the Environment
Dr William Batten	School of Civil Engineering and the Environment
Dr Luke Blunden	School of Civil Engineering and the Environment
Dr Sally Brown	School of Civil Engineering and the Environment
Prof John Chaplin	School of Civil Engineering and the Environment
Dr Derek Clarke	School of Civil Engineering and the Environment
Mr Jack Giles	School of Civil Engineering and the Environment
Dr Paul Kemp	School of Civil Engineering and the Environment
Mr. Mark Leybourne	School of Civil Engineering and the Environment
Dr Mustafa Mokrech	School of Civil Engineering and the Environment
Dr Gerald Muller	School of Civil Engineering and the Environment
Dr Luke Myers	School of Civil Engineering and the Environment
Prof Robert Nicholls	School of Civil Engineering and the Environment
Prof John Preston	School of Civil Engineering and the Environment
Dr Ben Waterson	School of Civil Engineering and the Environment
Prof Chris Clayton	School of Civil Engineering and the Environment
Prof Harvey Rutt	School of Electronics and Computer Science
Dr Zed Sabeur	School of Electronics and Computer Science
Dr Colin Upstill	School of Electronics and Computer Science
Prof Mark Spearing	School of Engineering Sciences
Prof Janice Barton	School of Engineering Sciences
Dr James Blake	School of Engineering Sciences
Dr Stephen Boyd	School of Engineering Sciences
Mr Ian Campbell	School of Engineering Sciences
Dr Zhi-Min Chen	School of Engineering Sciences
Prof Grant Hearn	School of Engineering Sciences
Dr Dominic Hudson	School of Engineering Sciences
Prof Kai Luo	School of Engineering Sciences
Dr Simon Quinn	School of Engineering Sciences
Prof Philip Wilson	School of Engineering Sciences

Prof Geraint Price	School of Engineering Sciences
Prof Ajit Sheno	School of Engineering Sciences
Dr Ming-yi Tan	School of Engineering Sciences
Dr Dominic Taunton	School of Engineering Sciences
Prof Penny Temarel	School of Engineering Sciences
Dr Stephen Turnock	School of Engineering Sciences
Dr Yeping Xiong	School of Engineering Sciences
Prof Xin Zhang	School of Engineering Sciences
Dr Julian Wharton	School of Engineering Sciences
Prof Frank Walsh	School of Engineering Sciences
Prof Robert Wood	School of Engineering Sciences
Prof Peter Atkinson	School of Geography
Prof Paul Carling	School of Geography
Prof Steve Darby	School of Geography
Mr Chris Hill	School of Geography
Mr Jason Sadler	School of Geography
Prof Steven Pinch	School of Geography
Prof David Sear	School of Geography
Prof Peter Sunley	School of Geography
Dr Jonathan Adams	School of Humanities
Dr Julia Banister	School of Humanities
Prof Tim Bergfelder	School of Humanities
Dr Lucy Blue	School of Humanities
Prof Bill Brooks	School of Humanities
Ms Frances Clarke	School of Humanities
Prof Elizabeth Dore	School of Humanities
Dr Mary Hammond	School of Humanities
Dr Graeme Earl	School of Humanities
Dr Stephanie Jones	School of Humanities
Dr Marianne O'Doherty	School of Humanities
Prof Matthew Johnson	School of Humanities
Dr James Jordan	School of Humanities
Prof Simon Keay	School of Humanities
Prof Tony Kushner	School of Humanities
Prof John Oldfield	School of Humanities
Dr Christer Petley	School of Humanities
Dr Prem Poddar	School of Humanities
Prof Joachim Schloer	School of Humanities
Dr François Soyer	School of Humanities
Dr Fraser Sturt	School of Humanities
Prof Yvonne Baatz	School of Law
Prof Charles Debattista	School of Law
Dr Andrew Serdy	School of Law
Mr Richard Shaw	School of Law
Prof Hilton Staniland	School of Law
Dr Julia Bennell	School of Management

Dr Tolga Bektas	School of Management
Dr Arni Halldorssan	School of Management
Prof Douglas Macbeth	School of Management
Prof Stephen Ward	School of Management
Prof Terry Williams	School of Management
Dr Yue Wu	School of Management
Prof Richard Dale	School of Management
Prof Jacek Brodzki	School of Mathematics
Prof Jörg Fliege	School of Mathematics
Dr Marvin Jones	School of Mathematics
Prof Colin Please	School of Mathematics
Prof Chris Potts	School of Mathematics
Prof James Vickers	School of Mathematics
Prof John Forster	School of Mathematics
Professor J Simpson	School of Social Sciences
Mr John Gillett	Winchester School of Art
Prof Bashir Makhoul	Winchester School of Art

Appendix 2 – Ethical Guidelines Documents

Research description, Ethics & Data protection

Project: Mapping and understanding the external engagement of the University of Southampton in the MARITIME sector

Background

This research project will take place between November and February 2009 and will involve academics of the Maritime Studies strategic research group. It is part of a Business Fellowship within the Employer Engagement Initiative, which is funded by HEFCE and led by the Learning and Teaching Enhancement Unit.

Aim

The project aims to map and understand external engagement of academic staff, within the Maritime Studies USRG, in order to assess the type of relations and exchanges taking place with companies, public sector bodies and other organisations.

Methods

Social network analysis: to create a map of external engagement dynamics: such as type/nature of relations, type of external partners involved, strength of exchange etc.

What is social network analysis?

Social network analysis (SNA) is a powerful and relatively new research tool which has developed popularity in recent years. It “provides a way to make the invisible visible and the intangible tangible” (Borgatti & Molina, 2003, p. 337). In order to examine the network-level phenomena of interest to social network analysts, researchers have used a survey method called sociometrics. Free-response is used to determine ego-centric networks, in which the respondent is the centre of a personal network. This method is often used in large-scale network studies or when the boundaries of a network are unknown. The resulting data can contribute to system network if the reported relationships are combined with others from the system, making interconnections apparent. This is the method used in the current research. In contrast, rosters are used when the boundaries of a network are known (e.g., a classroom or organisational setting). All parties in the network are polled for their relationships. Roster data contributes to knowledge of all of the interconnections in a whole network.
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Simply asking respondents for their contacts (based upon friendship, acquaintance, expertise, etc.) is the most basic sociometry. The resulting respondent names and their contacts are organised into pictorial sociograms in which each respondent-contact relationship is represented by circles with lines linking them. Some circles, or nodes, will have more than one line linking in/out, and this determines their positions in the network.

For more information: http://www.analytictech.com/networks/whatis.htm

Qualitative interviews: to investigate the nature of these collaborations, how they get established and what facilitates or inhibits their development.

Ethical consideration and data protection

An important prerequisite of any research conducted using human participants is the assurance of anonymity and confidentiality in order to protect them from any potential harm. As (Kadushin, 2005) argues, in social network analysis “the collection of names of either individuals or social units is not incidental to the research but its very point,” (p. 141). Therefore, the data collected will be analysed but always presented in anonymous form. In order to guarantee confidentiality to the participants of the research a ‘confidentiality agreement form’ is provided to the participants and they are able to decide in which way they prefer to disclose (or not) the information provided.

Important! There are obvious ethical concerns when conducting social network research. This paper has outlined issues of anonymity, confidentiality and informed consent. In the

present research we appreciate your concerns and if before providing data you would like to talk through any issues, please contact the principal investigator: R.Comunian@soton.ac.uk

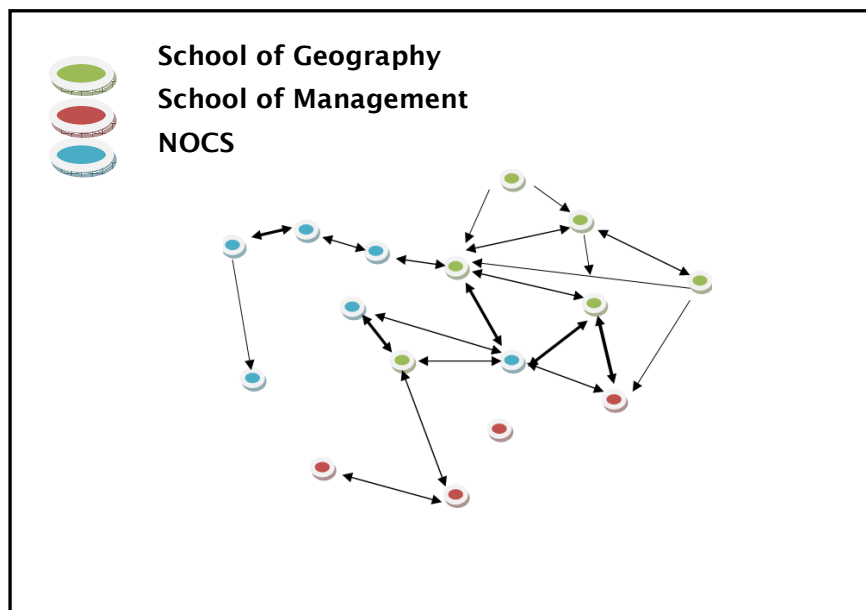
How will the data you provide for the present study be used?

When you provide names and personal contacts within this present research, you are guaranteed a certain level of anonymity. If you would like a higher level of anonymity and confidentiality you have to state this in the 'confidentiality agreement form' (this form is attached and you will be asked to sign it after a brief meeting with the PI).

Internal Network analysis

- Anonymity: your name and the name of the other member of the USRG will not be disclosed in the display of the network.
- Nodes (=people) will be simply grouped and analysed in function of these categories:
 - o School or research group (each individual will be coloured / identified by his/her school and research group)
 - o Seniority: individuals might be classified by their seniority level
 - o Affiliation at UoS: individuals might be identified by the length of time they have been based at UoS
 - o Gender: individuals might be classified by their gender
- While the overlapping of these categories might allow a degree of identification between the node and the person, this would only be a guess by the observer as anonymity will be respected in all uses (internal and external) of these data.

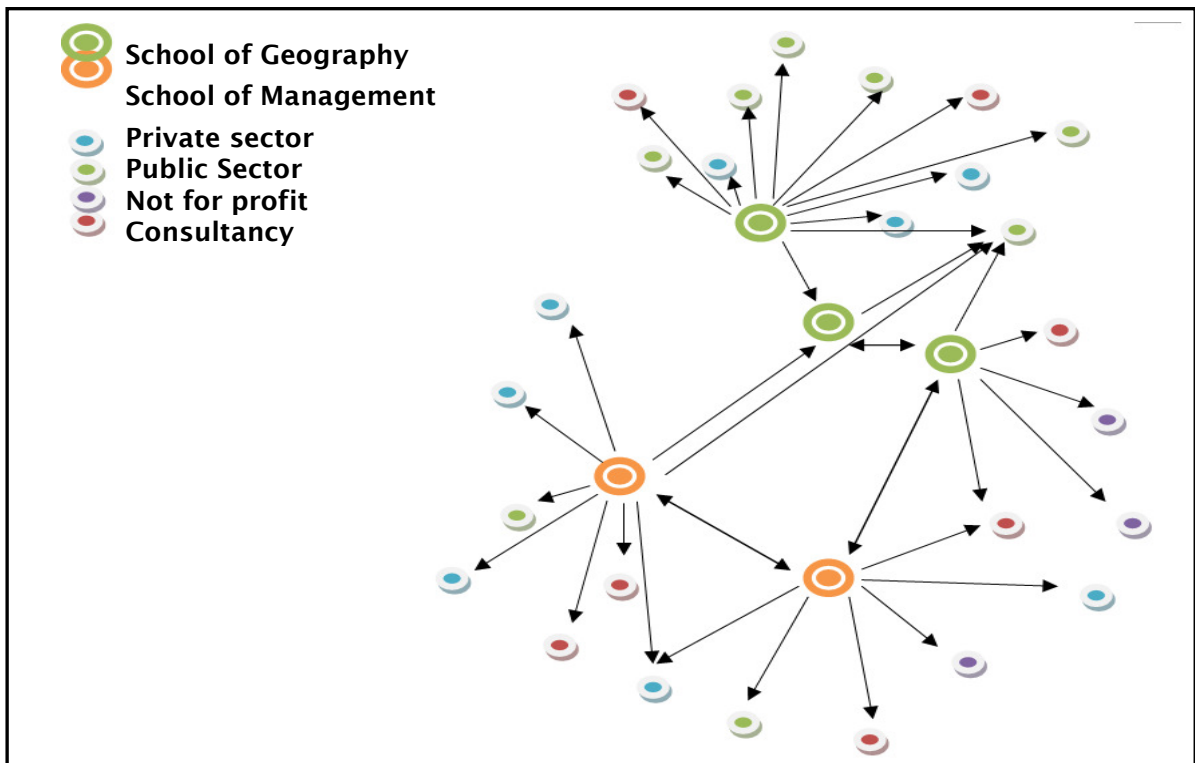
Below you can see an example of the way the data will be visualised and presented (for internal or external use)



External Network analysis

- Anonymity: your name and the name of the other CONTACTS you have included will not be disclosed to anyone (internally or externally within the UoS) apart from the researcher.
- Anonymity of the person completing the SNA questionnaire will be guaranteed in all publication of these data.
- In order to get the best use out of the data collected, we might identify the node of the contact you included using their 'company' name (you can opt out from this possibility completing the 'confidentiality agreement form').

- Nodes (=people you mentioned as contacts) will be simply grouped and analysed in function of these categories:
 - o Their geographical location;
 - o Their sector of activity;
 - o The kind of benefit they bring to your research;
 - While the overlapping of these categories might allow a degree of identification between the node and the person, this would only be a guess by the observer as anonymity will be respected in all uses (internal and external) of these data
- Below you can see an example of the way the data will be visualised and presented (for internal or external use)



Appendix 3 – Confidentiality agreement form

(To be completed with the researcher)

Project: Mapping and understanding the external engagement of the University of Southampton in the MARITIME sector

Researcher: Dr Roberta Comunian, University of Southampton (School of Geography)

This consent form, a copy of which will be left with you, is part of the process of informed consent in relation to your participation to the present research project.

If you would like more detail or information, feel free to ask. Please take time to read this carefully.

- 1) The aim of the project is to map and understand external engagement of academic staff, within the Maritime Studies USRG, in order to assess the type of relations and exchanges taking place with companies, public sector bodies and other organisations.
- 2) Subjects are asked to complete two social network analysis questionnaires (one mapping internal relation, one mapping external ones) and undertake a brief interview with the researcher.
- 3) Complete confidentiality will be always maintained in reference to the person completing the questionnaires and interviews (i.e. your name will never be disclosed) including reports and publications.
- 4) In reference to the external partners you name in your social network analysis questionnaire you can choose different levels of anonymity of how the data can be showcased and presented to internal and external partners:
 - ☐ Complete anonymity: The name of the person, company will not be disclosed
 - ☐ Partial anonymity: The name of the company can be disclosed, but not the name of the person you collaborate with
- 5) Use of data by the Employer Engagement Initiative (EEI) team. The EEI is a 2 year HEFCE funded programme that aims to engage employers more closely with the University for the identification and expansion of professional development opportunities, primarily at Masters level. Some of data collected through this project will inform the initiative of EEI. Please let us know if you agree with the data you provided being shared with the Employer Engagement Initiative in these two ways:

Aggregated disclosure: The name of the company can be disclosed in a separate list which includes all the companies with which the University of Southampton Maritime Studies USRG works (without referring to you or the name of the person you work with);

- ☐ Agree
- ☐ Disagree

Possibility to get in contact with you: EEI would not use the contacts you provide to directly approach employers. If, however, an opportunity arises to involve you or any of your contacts in the programme, would you be prepared for a member of the EEI team to contact you to explore the possibilities?

- ☐ Yes, please feel free to contact me
- ☐ No

- 6) If you agreed to be interviewed as part of the research project. A digital recorder will be used during the interview. All the information will be treated as confidential and the only person to have access to the raw interview materials will be the researcher. All materials

from the interview will be used in anonymous form, any name or project mentioned which might enable the identification of the participant will also be made anonymous

Your signature on this form indicates that you have understood to your satisfaction the information regarding the participation in this research project and the way the data will be used and treated.

Principal investigator: Dr Roberta Comunian ext. 26711 R.Comunian@soton.ac.uk

Participant's Signature

Date

Interviewer's Signature

Date

Appendix 4 – Interview Outline

- **Introduction about the project**
 - **Use of personal information or any confidential data**
 - **Ethical guidelines and access to data**
- 1) Looking at the SNA filled in by the interviewee: you have included a variety of contacts in your list, can you please give me an overview on the nature of the project /collaborations you have been involved with that included external partners?
 - 2) What are the main benefits of collaborating with external partners?
 - a. Are your previous experiences all positive?
 - b. In which respect to you think these benefits are personal or concern also your School and the university at large?
 - 3) Motivations behind external engagement
 - a. What are your personal motivations behind engaging in these relations?
 - b. Do they help your research or teaching career?
 - c. Are they linked to CDP and teaching expansions?
 - 4) Facilitating external engagement
 - a. Did you find it easy to start these relations?
 - b. Does your job allow space / time to establish these collaborations?
 - c. What are the people / events which benefit your possibility to engage with the outside?
 - d. How do you see your participation to the Maritime Studies USRG helping developing those connections?
 - 5) Barriers to external engagement
 - a. What are the difficulties in establishing / maintaining these relationships?
 - b. How easy do you find it to capitalize also on your colleagues contacts?
 - 6) Future perspectives
 - a. Do you see yourself working with these partners more or less in the future?
 - b. What could help you establish more collaborations or making these collaborations growth?

Appendix 5 – Internal network analysis questionnaire

QUESTIONNAIRE 1: INVESTIGATING INTERNAL NETWORKS

**PLEASE COMPLETE THE COLOURED BOXES AND
READ THE INSTRUCTIONS BELOW**

Your Name and Surname								
Your School								
Research Group (within your School, if applicable)								
Year when you joined the University of Southampton as an academic								
Age (cross as appropriate)	☐	20-35	☐	36-49	☐	50 +		
Gender (cross as appropriate)	☐	Male	☐	Female				
Role at the University of Southampton (cross as appropriate)	☐	Mainly teaching	☐	Mainly research	☐	Teaching and research	☐	Support

INSTRUCTIONS

In the list that follows are included all academics that have expressed an interest and have been involved with the activities of the **Maritime University Strategic Research Group** since 2008. Please simply scroll down the list of names (School affiliation is also given) and assign your relationship with each person to one of the following three categories:

Relation Type 1	I have not heard about the person before or I have heard of him /her but I am not aware of his /her research/activity;
Relation Type 2	I have heard of the person and I am aware of his / her research interests /activities and strengths but I have not actively collaborated with him / her (active collaboration means one or more of the following: a common publication; a common application for funding; a common research project / consultancy; a common teaching module or supervision of shared research students). In the case of support staff (only), this might include simply knowing the person's role.
Relation Type 3	I have actively collaborated with this person in the past (active collaboration means one or more of the following: a common publication; a common application for funding; a common research project / consultancy; a common teaching module or supervision of shared research students). In case of support staff,

	interactions on a project is required.
--	--

Simply put an X in the column which best describes the relationship you have with each person. Please fill in all rows and **only chose ONE relationship type for each row.**

[illegible]

Appendix 6 – Interview questionnaire for external engagement

Categories		Contact 1	Contact ...	Contact 10
Organisation / company name				
Organisation's area of activities / job title (if applicable)				
Title, Initials and Surname (optional)				
What is the main type of activity of this person / organisation ? (select only one option)	Education			
	Public Sector			
	Not for profit / Charity			
	Consultancy			
	Freelance			
	Private sector / Business			
	Research Council			
	Businesses Association			
	Others (please specify)			
Where does this person / organisation work from?				
When did you start collaborating with this person / organisation ?				
How would you define your relationship with this person / organisation ?	Solely Professional			
	Both Social and Professional			
What benefits does this relationship / collaboration	Collaboration on research projects / grants / Knowledge Transfer Partnerships			

bring to you / your School ? (please place 1 next to the most important benefit, 2 next to secondary benefit and 3 next to other relevant benefits)	Collaboration / opportunities in teaching and student placement			
	Access to funding opportunities or financial support			
	Commissioning of research or consultancy work			
	Bringing specific business knowledge within the University			
	Influencing public policy agendas in the field			
	Others (please specify)			

Appendix 7 – List of external partners organisations⁵

AA Technology
AGI
AIRBUS
American Bureau Shipping
Astrium
Atomic Weapon Establishment
AWE
BAE Surface Fleet
BAE Systems
BBC
BFI
BMT
Bournemouth Hebrew Congregation
BP
British Geological Survey
Church of England
Commercial
Crown Estate
DEFRA (2)
Department of Energy
DNV
Drake Marine International
DSTL (3)
DTI
EMU
E-ON
Esmée Fairbairn Foundation
European Space Agency
FLIR
Forestry Commission (2)
GE AVIATION
Geotech
Gillings Family foundation
Home Office
INSTRON
Intergovernmental panel on Climate Change
Israel centre for immigrants from Central Europe
Jewish Museum in Berlin
Jewish Museum in London (2)
LAVISION
LEO BAECK INSTITUTE LONDON
Lloyds Register (2)
Logica
Marine Climate Change Impact Partnership
Marine South East

⁵ The list does not include some of the companies that the respondents wished to keep anonymous (mostly oil companies). The number in brackets indicates that the organisation was mentioned more than once, by different respondents.

Maritime Coastguard Agency (2)
Mary Rose Trust
Max Planck Institute
MET OFFICE (3)
MoD (4)
MRAG
Nanotecture
NASA
National Audit Office
National Composite Network
National Marine Facilities Sea Systems
National Maritime Museum in Greenwich (2)
Natural England
NERC
NSF
Office of government and commerce
P&O
Project Management Institute
Qinetiq (2)
RDAs
RNLI (4)
Roll Royce
Rothschild Foundation
Royal Marines
Royal Naval Museum
SatOC
Sea City Museum (3)
SEAEYE Marine
SEEDA
Shell
SMD Ltd
Statoil
Stockholm Environment Institute
SUERC
Surrey Satellite Systems
Sydney Jewish Museum
The Wiener Library
Total Foundation
TWI Welding
UK HE Europe Unit
UK Space Agency
VISHAY
VML
Woods Hole Oceanographic Institution
World Bank
WWF