RSE Roadtrip Info Gathering Plan

Formal Title (for Stellenbosch University Ethics application): **Research Software Engineering Groups in the UK; Origins, Organisational Context, and Practices**.

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Rationale and Aims

The aims of this study are to provide useful information to the RSE Community on the subject of how to establish and develop RSE Groups, through comparing and contrasting the histories, strategies, and operational realities of a selection of UK-based RSE Groups.

This information will primarily be gathered by Dr Kim Martin during the course of the 'RSE Roadtrip' (from *5th May to 16th June 2023, with financial support from the [Software Sustainability Institute](#)*) mainly via interviews with individual RSEs (as circumstances allow, given voluntary participation of RSEs).

See '[Topics](#)' below for the kind of questions that may be asked.

The greatest value is likely to be realised if this includes RSE groups that are at different ends of one or more spectra (e.g. small-medium-large; integrated-vs-independent of IT; young vs well-established; highly-formalised vs less formal; centralised vs embedded/domain-specific etc).

See '[Itinerary](#)' below for RSE Groups that will be visited (with agreement from Group Leaders in place).

Shoaib Sufi (Software Sustainability Institute Community Lead): "*It's a key piece of work at a key moment - assessing how other groups formed and are run to inform the start of a new group in a relatively green field space - it will be really useful work for the RSE movement as a stud*y."

Primary Group Features / Variables

- Group Origins and **Context** (e.g. integrated with IT)
- Length of **Time** Since Group Establishment
- **Funding** Model (e.g. underwritten with some cost recovery from researcher projects)
- **Size** (e.g. number of RSEs / associated staff, rate of growth, associated community)

Itinerary

The following RSE Groups at the indicated UK universities will be visited for periods of time from one to several days between 5th May and 16th June 2023.

NB: Any information relating to features of individual groups may be inaccurate / out-of-date.

Manchester Digital Health Software

Embedded RSE team; domain- and technical-specialism.

https://sites.manchester.ac.uk/digital-health-software/

Manchester Research Software Engineering and Application Support

Large and well-established; close links with IT.

https://www.itservices.manchester.ac.uk/ourservices/catalogue/research/research-software-data-engineering/

Birmingham Research Software Group

The 'onion model'; mix of core and embedded RSEs.

https://intranet.birmingham.ac.uk/it/teams/infrastructure/research/bear/rsg/research-software-group.aspx

Sheffield Research Software Engineering

Large established RSE Group with clearly documented hiring etc practices; under leadership transition.

https://rse.shef.ac.uk/

Leeds Research Software Engineering Service

Small team of RSEs based in Research Computing. Group mainly works remotely.

https://arc.leeds.ac.uk/consulting/

Leeds Centre for Environmental Modelling and Computation

Small domain-specific group of embedded RSEs.

https://www.cemac.leeds.ac.uk/

York Research Computing

Small group of RSEs based in IT services.

https://www.york.ac.uk/it-services/research-computing/research-software-engineers/

Durham Advanced Research Computing (ARC) Unit

Small number of RSEs in Advanced Research Computing.

https://www.dur.ac.uk/arc/rse/

Newcastle Research Software Engineering

Large full-time team of RSEs with strong management systems; falls under 'Newcastle Data'.

https://rse.ncldata.dev/

UCL Centre for Advanced Research Computing

Large well-established Group; the first RSE Group formed.

https://www.ucl.ac.uk/advanced-research-computing/

Imperial Research Software Engineering Team

RSE Team in the Research Computing Service. Well-established med-large group; strength in community including internships etc, as well as in Open-Source projects.

https://www.imperial.ac.uk/admin-services/ict/self-service/research-support/rcs/service-offering/research-software-engineering/

Imperial Research Software for Infectious Disease Epidemiology

Based within MRC Centre for Global Infectious Disease Analysis and the Department of Infectious Disease Epidemiology at Imperial College London. Larger departmental (domain-specific) RSE group.

https://reside-ic.github.io/about/

Kings RSE Team

New group in the process of establishment (based in e-Research); should have first recruits by June.

https://docs.er.kcl.ac.uk/research_software_engineering/

King's Digital Lab

Established RSE Group specialising in Digital Humanities.

https://kdl.kcl.ac.uk/

Data ethics & management

Equity-Diversity-Inclusion (EDI)

When collecting protected characteristics: gender, ethnicity, sexuality and suchlike, one needs to be very clear on the purpose. It's an interesting quandary: we don't know if a field is representative unless the information is collected… but is it too intrusive to collect the information?

It could be argued that different team- / management- / work-structures may differentially affect different people, e.g. particular styles of working may be preferable / problematic to particular demographics.

The numbers will likely be too low (with too many confounders) to get actual answers, but may provide useful indicators / a prototype for future work? Perhaps make it an (optional) topic for interview / discussion (being clear that it is optional?).

Demographic / individual variables to consider collecting:

- **Age (additional challenges re Ethics / sensitivity)**
- **Gender (additional challenges re Ethics / sensitivity)**
- Dependents / Care responsibilities
- Work environment preferences (e.g. isolated vs sporadic engagement vs social immersion)
- Level of experience in a RSE-type role
- Prior work experience (before joining RSE group)

Team-/Management-/Work-style variables that may interact with EDI / individual variables:

- Remote vs Onsite (% time, choice)
- Flexible hours
- Hierarchical vs egalitarian
- Management practices (e.g. Agile)
- Distribution of work (collaboration vs individual)
- Distribution of time (full-time vs fractional FTE)

Other variables that may interact with EDI / individual variables:

- Recruitment processes (e.g. target audience; level of experience / skill asked for)

Consent

TODO: Link to Consent Form created from SU Ethics template

Prior to visiting each group, a copy of the Consent Form will be sent to each Group Leader for review.

Prior to each interview / discussion, the Consent Form will be given to each RSE to sign (an extra copy will be left with them).

Plan: pass the (password-protected) notes from each interview back to the interviewee and give them the (granular, point by point) options of
(A) publish with attribution (name source to give credit);
(B) publish with anonymization (without naming source and/or as aggregation);
(C) do not use (delete from database).

Data storage & collection

Must use Microsoft OneDrive managed by Stellenbosch University ('SU OneDrive') for all personal (identifiable) data that is not otherwise encrypted / protected.

Access to files in SU OneDrive to be limited to necessary personnel only.

Paper notes to be transcribed to OneDrive and destroyed as soon as possible; where possible (e.g. in meetings), capture notes directly to digital documents stored in SU OneDrive.

When conducting interviews / discussions, attempt to find relatively private settings (avoiding the risk of eavesdropping), and record audio using MS Teams directly to the SU OneDrive for later review.

Topics

Questions on different topics will be asked to different individuals as appropriate (i.e. basic information may only be asked of the Group Leader or a designated representative, whereas questions that may involve different perspectives may be asked of multiple RSEs within the same group).

Some questions may not be asked (routinely) - this will be opportunity- / context- / cue-dependent.

RSE Group history and context

Origins and organisational context

- ☐ When / how did the Group start?

- ☐ Where does the Group formally sit within the host university (represented as an org-chart)? Inside / associated with one or more Faculties, or in a non-Academic context? How did this come about?

- ☐ How much (formal) support for the Group is there from the host university, and in what kind?

- ☐ What oversight exists for the Group? Is there a Governing Board and/or similar? Is there a mechanism for Academic involvement / input generally (direct or advisory)?

☐ Is there a schedule / expectation of reporting on Group outputs / contributions / initiatives? What is typically included in such reports? What depends on them?

Funding / costing model

☐ How are RSE salaries and any additional costs paid? Is there any underwriting / cost-recovery model with (parts of) the host university? Is the RSE Group seen as baseline activity / support for researchers by the host uni (covered by overheads), or as an independent unit responsible for covering costs?

☐ What is the relationship between RSE income / costs and university costs (e.g. 'Internal Cost Recovery Rate' / 'Full Economic Costing' applies for Researcher grant-funded projects?)?

☐ Is there a mix of Project-/Grant-funding and Core-/Uni-funding? If so, what is the relative amount (and what tends to be covered from either source?)?

☐ How are RSE contracts managed? Are they full-time, on rolling contracts, or project-dependent? Are RSEs typically named as working on (e.g. longer) projects / grants, or is a pool model used? Are RSEs formally employed by the RSE Group or seconded etc?

☐ How are RSE management salaries / costs covered? Are they included as an overhead and split across projects?

☐ Do Researchers typically write RSE time into their grant applications? If so, how was this norm established? Do RSEs participate in grant-writing?

☐ Are there any other sources of funding, other than direct project funding from researchers, and/or central / baseline funding from the host uni (e.g. funding direct from outside sources, non-profit or commercial)?

RSE Careers

Recruitment and retention

☐ How are new RSEs recruited? What approaches are used, and how is the role presented? What level of experience / skill / education is typically asked for (in both the research and software side)?

☐ Is recruitment of new RSEs a challenge? Why?

- ☐ Where do new RSE recruits come from? Local (RSE / Researcher) community? Other universities? Academia (research background?) vs industry (Software Engineering / Developer background?)?

Training and career development

RSECon22 slides from Rob Haines: "*I would like to see UK RSE… Help define formal skills/competency frameworks within which we can help people develop and progress (we have the opportunity to do some of this work with our Research Lifecycle Programme, and I'd like to do it with and for the community).*"

- ☐ How are the early stages of (new RSE) on-boarding carried out?

- ☐ Are times / resources formally allocated to training RSEs? Is such training conducted within a framework of skills / competencies required for progression?

- ☐ Do RSEs in the Group have access to regular networking and/or training events?

- ☐ Is (in)formal mentorship practised within the Group? How?

- ☐ Does the RSE group mostly hire people with more software experience and less research experience, or vice versa, and how is development of new hires managed in either case?

- ☐ Do RSEs take advantage of opportunities for further study while working in the host uni?

- ☐ Are there formal roles (at different levels) within the team? What are they, and what are their criteria? (How) Do the levels within the group correlate with the host uni's (academic or support staff) salary scale (e.g. in Manchester, 'Junior RSE' = 'Research Assistant')?

- ☐ Do RSEs have clear options for career progression within the team?

- ☐ What are internal attitudes to / opportunities for RSE career progression outside the team (in other RSE roles, or otherwise, including outside academia)?

Specialisation

- ☐ Does the RSE Group specialise in any particular technologies and/or domain(s)? What technical services do they offer? Which scientific domain(s) do they engage with?

- [ ] Do individual RSEs within the group tend to specialise in particular technologies and/or domain(s)?

- [ ] Is there any policy to encourage RSE technology / domain specialisation, or conversely are RSEs supported to diversify their skills?

- [ ] What Faculties / disciplines do Researcher clients typically come from? Is the RSE Group positioned to serve the entire host university (as a 'Central' RSE Group), or is it focused on a particular Faculty / discipline (is it considered an 'Embedded' RSE Group)?

RSE Team

Structure and policies

- [ ] What does the org chart within the Group look like? What are the roles / responsibilities (e.g. 'business acquisition by HoRSE'? Other typical roles / responsibilities?)?

- [ ] Is there clearly-defined line management in the group? How is it organised / practised (regular meetings, progress reports?)? What are the expectations / responsibilities on both sides?

- [ ] (How) Are RSEs divided into (permanent or short-lived) sub-teams to carry out work (e.g. based on projects, management structure, and/or domains / skills)?

- [ ] How are projects and other work divided within the group and (shared) between RSEs? Are multiple RSEs assigned to individual projects? Are individual RSEs assigned multiple projects? How is this managed?

- [ ] Are flexible working hours permitted to RSEs? Is the existing policy on this considered good/bad by current group members?

- [ ] Are there options for remote vs in-person work? Is the existing policy on this considered good/bad by current group members? What is the typical work-environment for group members like?

Team composition

- [ ] What is the Group composition in terms of age (ranges) and gender?

☐ What is the Group composition in terms of prior education (level and field) and work experience? How many members have a PhD? How many members have prior formal training / experience in software engineering?

☐ How many of the Group come from a traditional Software Engineering / Developer / Computer Science background, vs another discipline?

Practices and processes

☐ How are projects managed? Are Agile or other formal project management processes used? Which platforms are used in managing projects (e.g. GitHub)?

☐ Is the RSE Group and/or individual RSEs monitored using any form of Key Performance Indicators? Are software publications / citations, paper co-authorship, and/or named involvement in grant applications considered? Are performance appraisals / reports carried out, and what is their significance?

☐ Are there formal / documented Standard Operating Processes or similar? Can details of (any of) these be shared for the purposes of a report to the RSE Community? How well do they work?

☐ Have any practices / processes been adopted / adapted from traditional Software Engineering? Which and why?

Local RSE Community

RSECon22 slides from Mark Richardson: "*I would like to see UK RSE… Be more vocal about embedded (non centralised) RSE people*"

Embedded RSEs - formal teams

☐ Are there any other RSE Groups within the same host university? What (if any) relationship exists with them?

Embedded RSEs - (in)formal communities

☐ Is there a(n) (in)formal community of embedded RSEs (and/or 'proto-RSEs') in the host university? How large is it? What (if any) roles does the RSE Group play in this?

Relationships with other communities / groups

Relationship to academic Researchers

- ☐ What means does the RSE Group use for engaging with Researchers (e.g. webpages, mailing lists, free workshops, etc).

- ☐ What is the relationship between the RSE Group and the local Researcher community? Are interactions with Researchers limited to particular Faculties / disciplines? How do Researchers perceive / understand the role of RSEs?

- ☐ To what extent do RSEs engage with the scientific / research component of the projects they are involved in / assist with (e.g. experimental or conceptual details, process of publication)? Is (other) domain expertise and/or prior research experience typically of value?

- ☐ Is there a norm of including RSEs in publications as co-authors or under the acknowledgements? Does the Group have any policy to encourage such acknowledgement? Are RSE contributions tracked using any other metrics?

Relationship to students (and their lecturers / supervisors)

- ☐ Are students provided with any opportunities to learn about or engage with RSE activities? Are their lecturers / supervisors involved, if so?

Relationship to (other) university support services

- ☐ (How) Does the RSE Group integrate / interrelate with the IT support services at the host university?

- ☐ Are RSE seen as being part of IT support services within the host uni, or are they seen as being closer to Researchers? Why might this be so, and how does this perception tend to manifest?

- ☐ Does the RSE Group engage with university IP representatives around software licensing and (development / use of) Open Source software? Does the host uni have a clear policy around Open Source software as a research output (pro or con)?

Relationship to (non-RSE) Software Engineers / Developers

- ☐ Does the Group have any relationship with traditional Software Engineers (as in classical / industry software engineering) and/or Developers at the host university, or elsewhere?

RSE work

- ☐ What is the breakdown of time spent in Researcher training vs more direct project involvement, etc?

- ☐ How much and what types of demand for RSE time is there? How consistent is it? To what extent is the group able to meet the demand?

- ☐ Is there much (need for) 'business development' for the RSE Group, in one or more areas of work (e.g. actively seeking to raise interest in training, consulting, and/or software development)?

- ☐ What metrics / anecdotal evidence can the RSE Group use to justify its value to the host uni, across all forms of work that its members engage in?

Researcher training

- ☐ What (if any) training opportunities are offered to Researchers? On what subjects? With what level of extensiveness (e.g. workshop duration)? Free or for a fee? Any follow-up support?

- ☐ Does the Group offer Carpentries workshops (officially or unofficially)? Is any other other material used as-is or with modifications, or does the Group create its own material for training Researchers?

- ☐ Are there any community platforms within the host university to enable Researchers to get assistance as they learn to write their own code etc (e.g. via code review or Q&A)? Does the RSE Group have any involvement in this?

- ☐ Are there any topics on which it is considered foundationally important to educate Researchers (e.g. use of version control, adequate documentation, etc)? Does this have any role in gaining / retaining Researchers as clients?

- ☐ Does the RSE Group take any role in establishing / promoting best practices around software development-related activities (e.g. documentation, licensing) across the host uni?

Researcher consultations

☐ Are consultations with RSEs available to Researchers? What is the typical duration and cost of consultations? Is there a clear aim to produce a grant application that includes RSE time?

☐ What types of assistance are provided to researchers that could be described as consultancy? At what stage(s) in a project (e.g. planning, funding application, code review) do consultations tend to occur?

☐ To what extent does the RSE Group serve as a 'knowledge broker' within the host uni, e.g. via assisting in the re-use of existing research software, and/or through promoting collaborations between researchers across different disciplines.

Researcher software projects

☐ How do RSE projects for Researchers get initiated (either in a 'greenfield' case, or when there is an established codebase)? Are there established practices / recommendations / prerequisites for client / project onboarding?

☐ What is the duration (range) of a typical software project engagement? Weeks, months, years?

☐ What types of tasks / roles do RSEs typically get involved with in Researcher software projects? Is there a particular focus on introducing any practices / elements of good Software Engineering (e.g. design, documentation, testing)? Do RSEs typically get involved in feature development and/or details of scientific code development?

☐ Does the Group take an intentional approach to establishing / improving software sustainability, and if so what does this involve?

☐ (How) Does the group address longer term software maintenance requirements? Are researchers advised to apply for funding for maintenance, or are such costs covered in other ways?

☐ To what extent do RSEs work on / with Open Source software projects? In what capacity? How are such projects typically funded?

☐ To what extent are Researcher software projects a cross-disciplinary collaborative exercise with the Researcher? Are other experts (including SE specialists) consulted at times?

- ☐ Is it a norm to share access to a developing code base in a version control platform (e.g. GitHub) with the client Researcher? (How) Are Researchers involved in iterative software development?

- ☐ Do RSEs in the Group publish software in a citable format (with a DOI)? Is there a Group policy to encourage this (and/or to encourage citation of software)?

- ☐ Does the Group maintain any record of software developed in their host university? Is there any policy / programme to make community software projects more visible / FAIR?

Other RSE work

- ☐ Do RSEs participate in any work that does not fall into the 'Researcher training, consulting, and software development / engineering' categories? (e.g. work done on university-wide infrastructure projects, such as managing version control repositories etc).

Engagements outside host university

Industry engagements

- ☐ Does the RSE Group have any engagements with industry clients or partners (that can be divulged)?

(Inter)National engagements

- ☐ Does the RSE Group have any engagements with (inter)national clients or partners (that can be divulged)?

Strategy and future plans

- ☐ To what extent / rate has the RSE Group's size and mandate been changing since it was formed?

- ☐ What are the greatest challenges the Group currently / typically faces?

☐ Are there any plans to experiment with / change any elements of context or internal practices?

RSE Ontology

TODO: Link to RSE Ontology for input

☐ How might the RSE Ontology (in development) be of value to this Group, or more broadly? What should it include?

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