Navigating Careers in Digital Research: How the DIRECT Framework Can Help

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Digital and computational skills have transformed the way we do science and research. From managing datasets to developing complex software and running analyses on high-performance computing platforms, the work is increasingly technical, collaborative, and fast-moving. With this complexity comes a question: **how do researchers and digital technical professionals plan their careers and build the right skills for the future?**

The **DIRECT (Digital Research Competencies)** framework tries to provide at least a partial answer to this question.

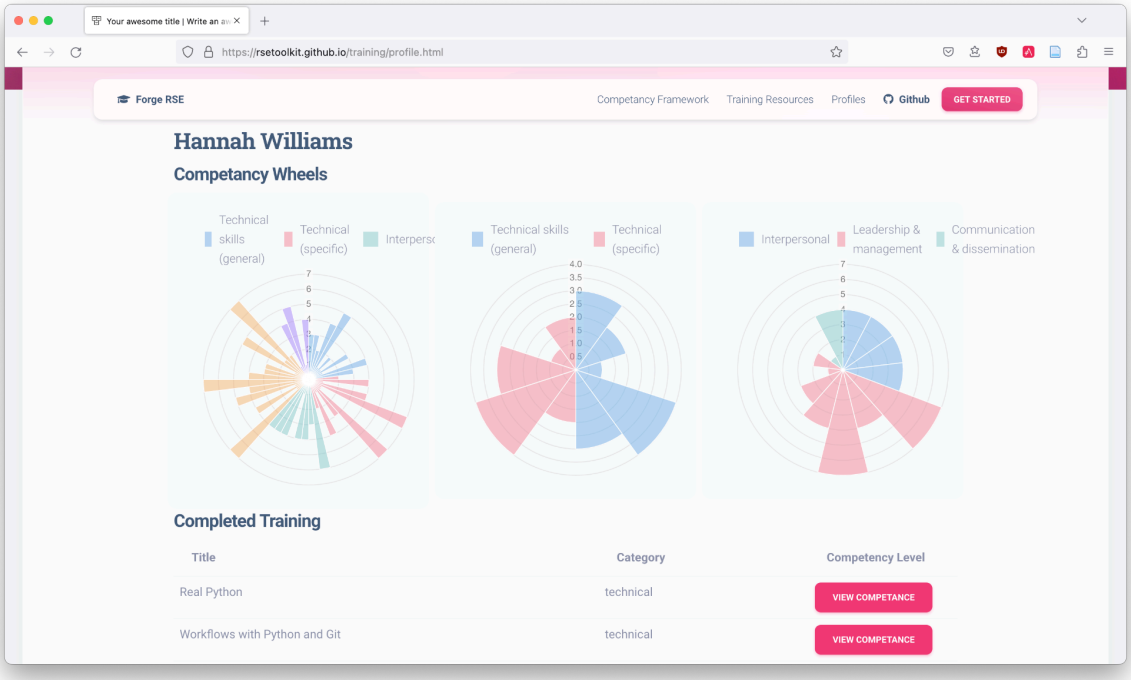
A Short History

The DIRECT project grew out of discussions within the UK and international **Research Software Engineering (RSE)** community - starting from the work that happened at the Software Sustainability Institute's Collaborations Workshop 2023 Hack Day which was then kept active to date by a number of RSEs from the community.



Participants of the CW23's HackDay working on "RSE skills and competencies" idea, CW23, University of Manchester (© 2023 SSI)

The idea was to construct a resource on (initially only) technical skills that was curated by the RSE community, along with training materials that can help RSEs gain a particular skill, and visualise their individual skill profiles as "competency/skills wheels" to show individual's skills across different areas.



Prototype application developed at CW23, courtesy of CW23's HackDay participants

This type of chart makes it easy to see strengths at a glance (e.g. collaboration, programming) and identify areas for development (e.g. leadership, management).

The resource was meant to support (in particular junior) RSEs in tracking and managing their professional development.

As RSEs carved out their identity and position in modern research, it became clear that they needed a way to describe the diverse mix of technical as well as **professional** skills their work requires. Additionally, supporting just RSEs was not **diverse and inclusive** enough - we needed a way to support other digital research professionals. The original project was renamed to DIRECT framework - which was designed to meet that need: a shared, evolving framework that could support individuals, roles, teams and institutions in recognising and developing digital research competencies.

What is the DIRECT Framework?

DIRECT is a community-driven competency framework designed to capture the wide spectrum of skills needed across various digital research roles. It provides a **structured vocabulary and skill map** covering both:

- **Technical competencies**: such as programming, software design, data management, reproducibility, infrastructure, machine learning and data science.

- **Professional competencies**: including teamwork, communication, project management, leadership, and community engagement.

Each competency is described across a **progression of 4 skill levels**—from novice to expert—with examples of behaviors that demonstrate proficiency and each skill curated with adequate training (both still under development). This makes it easy for individuals to see where they stand, and what "the next step" might look like in practice.

Watch this short video of the project lead Dave Horsfall (SSI Fellow from Newcastle University) describing the DIRECT framework, how it identifies skills and defines development pathways for anyone working in research software, serving as an important tool to help with career progression.

Digital Research Competencies Framework

Why DIRECT Matters for Careers

The framework is designed to support **career development** at multiple levels:

- **For individuals**: DIRECT can be used for self-assessment, helping you identify your strengths, spot gaps, and choose areas to grow. It also provides language you can use in CVs, applications, or career conversations. In addition, the framework provides **aspirational (aka reference) role competency profiles** (for a number of standardised roles - e.g. data steward, RSE with HPC specialism, community manager or RSE team lead), to help identify the gap between your current and aspirational profile and highlight training resources that could help bridge that gap.

- **For teams**: mapping competencies across a group highlights overlapping expertise, as well as areas where new skills or training might be needed.

- **For institutions**: DIRECT supports clearer role descriptions, fairer hiring practices, and tailored training provision.

In short, it gives researchers and professionals in digital roles the same kind of structured career support that has long existed in more traditional academic and technical pathways.

Beyond the Framework: The Webapp

DIRECT does not stop at being a static list of competencies. A **sister project** **is underway in parallel to build a web application** that will make the framework interactive and practical. The app will allow users to:

- Create a **personal competency profile** or "skills wheel."
- Track progress over time and set development goals or compare with aspirational **reference role profiles**.
- Explore relevant training resources mapped directly to competencies.
- Support managers and institutions in creating team-level views and role profiles.

This companion tool will make DIRECT an everyday resource, turning the framework into a practical guide for career planning and skills development in digital research.

The first alpha release of the webapp is accessible at https://directframework.com where you can see the competency/skills wheels in action. This is a live project and still very much in development. If you have any comments, feedback or suggestions please let us know via the links below. There is plenty of room for additional maintainers so if you want to get involved please send a message to dave.horsfall@newcastle.ac.uk.

How to Get Involved

Both the framework and the webapp are open, community-driven projects. You can explore them under the DIRECT organisation on GitHub:

- DIRECT framework repository
- DIRECT Webapp repository

If you'd like to get in touch with the project team - email us at direct-framework@googlegroups.com or message us on #direct-framework channel under the RSE Community Slack (ukrse.slack.com).



Part of the DIRECT team at RSECon25, University of Warwick, Coventry (© 2025 RSE Society)