Research e-Infrastructure Career Seniority Framework (ReICSF) v1.0

Matej Antol[1,*]

[1]Institute of Computer Science, Masaryk University, CZ
[*]e-mail: antol@muni.cz

ABSTRACT

The Research e-Infrastructure Career Seniority Framework provides a structured approach to defining and supporting career pathways for professionals who operate at the critical interface between research and operations of data processing, storage, analyses and transfer platforms which are developed and provided at research infrastructures. By offering clarity of expectations across seniority levels, it helps individuals and institutions align skills, responsibilities, and development opportunities. The framework emphasizes the uniqueness of e-infrastructure roles, which differ from traditional IT or administrative positions through their closeness to the research process and their capacity to quickly and flexibly translate scientific needs into advanced technical solutions. Most importantly, it underlines the dual ambition of merging quality research with quality service, ensuring that both dimensions are advanced together to sustain and accelerate scientific progress.

Introduction

ReISF captures broad competencies contextually bound to research e-infrastructures. It was created to support the analyses, HR practice and decision making regarding the profile and career progression of the e-infrastructure professionals. These include situations such as hiring, regular performance assessments, salary negotiations, promotion decisions, and more. At the same time, as e-infrastructure is a rather specific and unconventional workspace with unique incentives and success criteria, the framework helps shed light on the role, ambition, and meaning of supporting research from the infrastructure perspective.

The Framework

ReICSF is a relatively simple and practical framework consisting of three dimensions (see Fig. 1):

- Four seniority levels – Junior, Medior, Senior, and Principal.
- Seven competency areas – Scope of activities, Leadership & initiative, Personal growth, Creativity, Working with people, Expertise, and Context & Business.
- Descriptions of typical traits and red flags for each seniority – competency combination.

It is important to stress that the framework can and should be extended or adapted to the specific needs of a given environment or institution. Seniority levels can be extended or reduced, competencies can be added or omitted, wage ranges can be attributed and further detail can be provided to better guide the user through the framework. With our without adjustments, the framework has two general uses: individual and multi-party.

Self-assessment and individual use

First, ReICSF sets out a clear pathway for anyone considering or already pursuing a career in research e-infrastructure. For those exploring this career, it clarifies the expectations that will, explicitly or implicitly, be applied to a well-performing employee. For more experienced professionals, the framework can act as a kind of "devil's advocate" regarding their seniority level and potential gaps.

Assessments, negotiations, and multi-party use

Second, the framework is a useful supportive tool in situations where seniority is being negotiated or evaluated, such as regular performance reviews or salary negotiations. In this context, it is the author's strong belief that the framework should not even be attempted to be used as an all-encompassing solution, but solely as a supporting tool within a broader evaluative approach.

Employee performance and seniority can be assessed through both qualitative and quantitative approaches. The qualitative perspective requires dialogue, acknowledges the often complex context of performance, and must be considered in relation to the immediate team, team leaders, and strategic objectives. It reflects how an individual contributes to the team efforts, develops within the organization, and aligns with broader strategic goals. Because it captures nuance and context, **qualitative evaluation must always be considered the most important and decisive part of any assessment**. Indeed, no framework can ever fully structure qualitative evaluation.

By contrast, quantitative evaluation focuses on measurable, comparable aspects of an employee's work: structured competencies, achievements, or indicators that can be consistently assessed across individuals. Within quantitative evaluation, two aspects can and should be distinguished: general seniority and technical seniority. There is an abundance of frameworks for technical seniority covering roles found at research infrastructures, including developers, engineers, service operators, UI designers, researchers, librarians, and project managers.

A comprehensive evaluation would, therefore, include three perspectives, the first of which must always be the most important by a significant margin:

1. qualitative assessment conducted through dialogue with supervisors and peers such as 360[1,2]
2. quantitative assessment of technical skills within the relevant profession,
3. quantitative assessment of general skills and seniority, which can be supported with ReICSF.

Exemplary Use Cases in Applying the ReICSF Framework

While the ReICSF framework is designed as a structured tool for assessing competencies and seniority, its true value emerges in practical situations where career development, management decisions, or individual reflection require clarity. The following three cases illustrate how the framework can guide both employees and managers in making informed choices.

Case 1: Frank – A Researcher Transitioning from Academia

Frank, a PhD candidate nearing completion, envisions a future in science but does not see himself thriving in the competitive world of high-profile research. He is instead motivated by the idea of tangible impact, contributing to progress through skills gained during her doctoral studies: laboratory work, publishing, mentoring, and problem-solving.

Using the ReICSF framework, Frank sees how her doctoral experience maps onto competencies relevant to research e-infrastructure. He recognizes strengths in leadership, personal growth, creativity, and collaboration, but also notes areas to develop: broadening his impact, deepening expertise, and adapting to the operational and business context of infrastructure work. This clarity helps Frank make a more informed decision about his career trajectory.

Case 2: Leslie – A Team Leader Seeking New Directions

Leslie has worked in research e-infrastructure for over fifteen years. She leads a team of seven covering an entire technology stack, while also supporting small number of research groups. Her career is full of achievements, and her younger colleagues value her as a mentor. Yet Leslie feels stuck: feedback from her manager is vague and lacks credibility due to the manager's distance from technical work.

The ReICSF framework shows Leslie that her next step is progression from senior to principal level. This requires stronger initiative, international recognition, and a clear vision for the infrastructure's future. She realizes that publishing, actively attending relevant conferences, and greater external engagement could build recognition, while sharing her internal vision more widely would both sharpen her ideas and allow people to adopt them. The framework gives Leslie both direction and concrete suggestions for growth.

Case 3: Chandler – A Manager Facing a Pay Decision

Chandler, a manager, must decide which of two equally strong performers deserves a salary increase despite limited resources. After conducting face-to-face evaluations, she remains undecided.

Here, the ReICSF framework's Red Flags prove decisive. These highlight underdeveloped skills alongside core competencies. In this case, "red flags" embedded in the framework reveal that one colleague struggles with knowledge transfer and collaboration across technically distant teams. This insight gives Chandler a rational basis for her decision and a transparent explanation she can share with the team, reinforcing fairness in a difficult situation.

Conclusion

The ReICSF is by design a lightweight, practical tool. It provides clear guidance for professional development and organizational decision-making in research e-infrastructures, while remaining adaptable to different contexts. By complementing qualitative judgment and role-specific evaluations with a structured assessment of general competencies, the framework helps ensure that seniority evaluations and (self-)assessments remain relevant, transparent, fair, and comparable over time.

References

1. Atkins, P. W. B. & Wood, R. E. Self- versus others' ratings as predictors of assessment center ratings: Validation evidence for 360-degree feedback programs. *Pers. Psychol.* **55**, 871–904, DOI: 10.1111/j.1744-6570.2002.tb00133.x (2002).

2. Edwards, M. R. & Ewen, A. J. *Three Hundred Sixty Degree Feedback: The Powerful New Model for Employee Assessment & Performance Improvement* (Amacom, New York, NY, 1996).

Competency	Junior	Medior	Senior	Principal
Scope of activities	Fixes simple issues and helps with small requests based on solutions provided by more experienced colleagues.	Finds and delivers solutions to well-defined problems within their team.	Finds solutions to complex and ill-defined problems. Demonstrates end-to-end ownership across multiple domains or several teams.	Finds solutions to undefined, breakthrough, and complex problems. Demonstrates comprehensive ownership across many contexts (projects, teams, even across organizations).
Red Flags	Does not respond to experienced colleagues' messages. Fails to deliver agreed solutions on time or at all.	Does not engage in solving team problems; does not consider team needs when prioritizing.	Stays within a narrow specialty and hands off more complex problems to others.	No visible, significant impact beyond their own team, project, or product.
Leadership & initiative	Follows guidance from a mentor/manager. Proactively asks questions, seeks information, learns from mistakes, and continuously improves.	Delivers tasks without close supervision. Respects leadership, clarifies requirements, contributes to discovery, and ensures they work on what matters for the team and product. Communicates across teams.	Is autonomous. Takes initiative and ensures projects are finished. Aligns others behind their ideas. Co-defines team goals. Ensures their work is meaningful and aligned with stakeholders' expectations beyond the local team. Secures external resources for the team.	Constantly shows initiative. Sets direction and ensures activities/projects contribute to the "big picture". Inspires others. Ensures team work is meaningful and aligned with stakeholders even outside the home organization. Can secure significant resources for the team and organization.
Red Flags	Doesn't ask questions of experienced colleagues; repeats mistakes.	Is not aware of team priorities; does not prioritize according to team needs.	Waits for assignments, doesn't keep projects moving, ignores broader impact of their work. Cannot secure resources for the team.	Lacks strategic thinking.
Personal growth	Shows strong motivation to improve. Actively seeks feedback, admits mistakes, and isn't afraid to ask for help.	Takes responsibility for themselves, continuously improves, actively looks for opportunities to improve the team and product, and offers solutions instead of complaints. Sees obstacles as growth opportunities.	Takes responsibility for themselves and for the team. Helps others and the whole team grow. Continuously increases team effectiveness via technical and organizational improvements. Seeks international collaboration.	Is nationally and internationally recognized as an expert, enabling new relationships with teams from different institutions and countries. Feels responsibility for the organization's reputation and functioning. Has several years of international experience.
Red Flags	Defends their mistakes and dislikes admitting when they don't know something.	Says "not my job", is passive, and treats obstacles as someone else's fault.	Says "not our job". Focuses only on themselves and ignores team growth.	Says "above my pay grade".
Creativity	Can solve routine problems; creativity and abstract thinking appear in well-named situations.	Creative thinker; quickly grasps and applies new concepts; can work with abstraction within established patterns. Has own ideas.	Exceptional abstract and original thinking; often combines different knowledge areas and creates new concepts.	Almost boundless creativity; sees connections others don't; has revolutionary ideas, and can strongly influence a wide environment with innovations.
Red Flags	Cannot solve common/simple problems; struggles to understand new concepts; thinks only mechanically.	Does not bring new ideas; says "Why change it if it works."	Is not an author and leader of a European project (at least at the work-package level).	Does not firmly stand behind their solution; cannot defend it convincingly.
Working with people	Needs guidance, avoids conflict, and struggles with stress.	Independent yet a team player. Communicates and solves problems; keeps learning to manage emotions and conflicts better.	Excellent communicator; resolves conflicts with empathy; manages emotions effectively; ensures good relations with neighboring teams.	Inspires others; handles crises excellently; proactively develops the team; manages their own and others' emotions very well.
Red Flags	Limited self-reflection. Persistent physical signs of stress/pressure; long-term paralysis due to stress.	Has colleagues they don't talk to due to personal disputes; handles conflicts emotionally rather than rationally.	Avoids addressing conflicts; lets emotions escalate; doesn't care for relationships in the team; struggles to collaborate across teams/groups.	Avoids communicating with important stakeholders; doesn't know whom to call when an issue affects the whole organization.
Expertise	Has basic knowledge and can use it in the area they work on. Needs supervision; is learning to apply theory in practice.	Handles routine tasks independently; works on more complex problems and challenges while consulting experts.	Has deep knowledge; solves complex problems effectively; mentors others; identifies problems early and knows when to consult or collaborate with third parties.	Is a recognized expert; also innovates, sets standards, and shapes the field's future direction; is in touch with international experts.
Red Flags	Is lost without supervision and cannot find resources or people who could help.	Needs help even with routine tasks; cannot escalate appropriately; avoids more complex work.	Does not pass knowledge on; cements themselves in an "irreplaceable" position.	Is not a co-author of a quality publication or other academically accepted result.
Context & business	Has basic awareness of the value and meaningfulness of their work in the context of the university and the research e-infrastructure.	Understands how the infrastructure supports research nationally and can link their work to the goals of the university and/or research e-infrastructure.	Understands very well the purpose and operations of the infrastructure; their activities improve its usability for researchers and students, which helps develop the infrastructure.	Has deep understanding of the functioning and strategic importance of the infrastructure; helps formulate a long-term vision and contributes to its development at national and international levels.
Red Flags	Doesn't know why they do what they do; doesn't want to know the broader context of their work.	Doesn't know the purpose of their and their team's work in the infrastructure's development; cannot explain to outsiders what they do.	Doesn't know which researchers use the results of their work and for what; cannot explain the meaningfulness of the team's work to superiors.	Has no realistic idea for further development of the infrastructure; doesn't know how activities fit the wider national and international context.

Table 1. The ReICSF v1.0 Framework with competencies (white rows), seniority (columns) and red flags (light red rows).