Overview of HR Challenges for ESFRI Projects

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- As far as we know, scientific research is an activity that's only performed by humans

- Nonetheless, this does introduce some challenges

Human Challenges for Large Research Infrastructures

- Technically challenging – need the right **skills**
- Big budgets – rigorous **project management**
- Big teams – effective people management, motivation and appropriate **culture**
- Ambitious goals – visionary **leadership**

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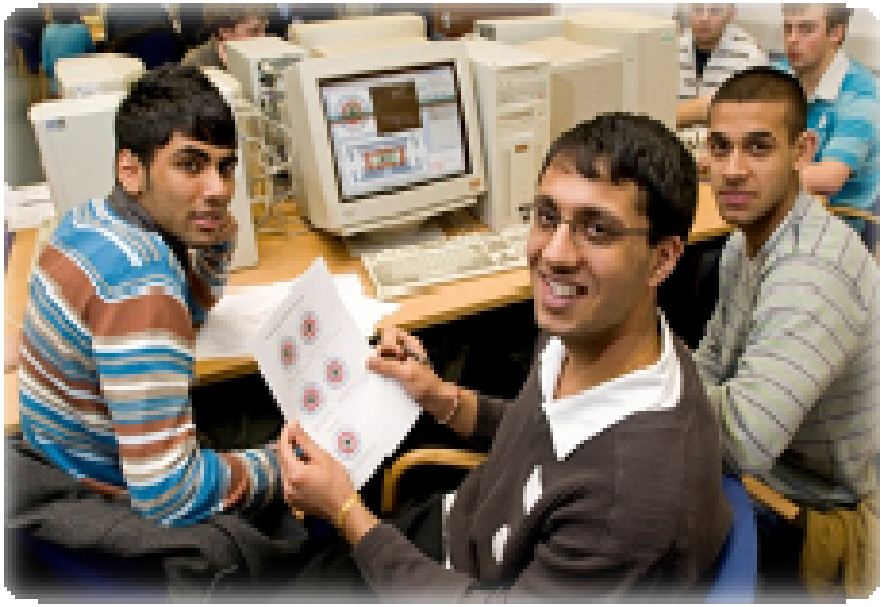
Skills and recruitment



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Mobility

- Scientific staff can be very mobile within their discipline
  - Evidence that scientists are more mobile than other professions – especially **early in their careers**
  - Internationally networked communities, so lower risk to move (as long as stay in the same field)
  - English widely used as the default working language
  - Often special visa schemes for scientists (though not for partners)
- Engineering and technical staff can be very mobile within laboratories
  - Less tied to discipline, more to location
  - e.g. Particle physics → light sources at SLAC and DESY

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… this is one of the arguments for co-location
of large research infrastructures

Promoting Mobility

- Improved researcher mobility is a key goal of the European Research Area
- Issues for engineering and technical staff
  - Languages and qualifications
  - Exchange schemes?
    e.g. RAL apprentices sent to ESRF and ILL every summer
- Social security and pension issues
  - less of a concern early in career?
- Issues with partners and families
  - Visas, International Schools, childcare, language skills
- Staff quotas tied to national shares in a facility?

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Project management

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Big projects – potential for big problems

Ref: Megaprojects and Risks – Flyvbjerg, et al 2003

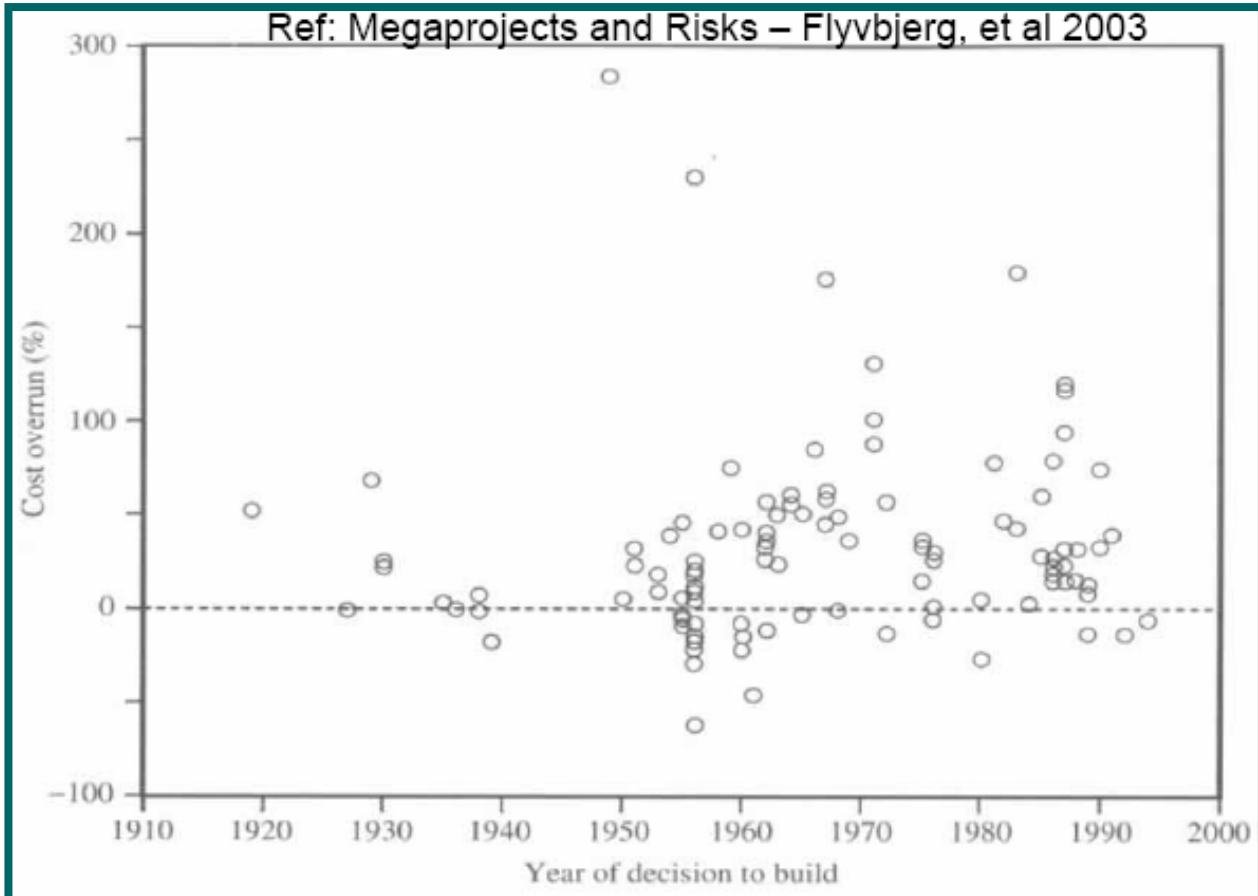

Figure 2.4 A century of cost overrun in 111 projects (constant prices)

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Summary of the Recommendations of the European Expert Group on Cost Control in Large RIs

1. At the start of a project the political stakeholders must agree on the scope, schedule and cost, and what to do if deviations occur... should include awareness of potential cultural differences between the partners
2. Where decisions are inspired by political and financial considerations, rather than scientific and technical requirements, the RI management must ensure that the political stakeholders are made explicitly and fully aware of the consequences…
3. The governance, management, and supervisory structures must have clear authority and responsibilities, be able to immediately impact the project and to quickly resolve conflicts…
4. A clear and structured organisation is necessary, with direct, transparent reporting lines…

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5. Independent scientific and technical evaluation and external professional auditing of financial and management performance must be carried out and acted upon.
6. A standardized, stepwise, and phased approach to the preparation and approval of an RI project…
7. The management must be chosen on the basis of clearly specified competencies, including project management and technical skills and must be given full independence, authorisation and responsibility…
8. … bottom-up planning, control and reporting systems based on work breakdown structures and financial management tools must be used. Management at all levels must have full responsibility and be accountable for their … budgets.

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9. Best-practice systems for project control and risk management have to be fully embedded in the project management… together with mitigating measures in case of deviations.
10. The procurement process should make best use of the internal and external technical expertise, and appropriate negotiation procedures
11. The responsibilities of all suppliers for deliverables must be contractually fixed in a detailed way... The project must have full daily access to all relevant information (technical, financial and schedule related).
12. Costs must be clearly defined and spending must be realistically planned, including in-kind contributions. Costs should be estimated with appropriate precision according to the different approval stages, and contingencies must be provided...

Human Factors in Project Management

- Be aware of cultural differences between partners – the RI may need to develop its own culture
- This culture must promote transparency, and must empower management at all levels to take decisions
- Make sure we have the appropriate project management skills in place: the best scientists can be poor project managers
  - Not (necessarily) “bring in the MBA’s to tell the scientists what to do”
  - But scientists need to accept that they will need training, and be supplemented by professionals (e.g. finance, HR, legal…)
  - Skills and culture needed in construction and operation phases are different; how to plan for and transition between the two?

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Culture

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Culture

“the way we do things around here”

make sure this does not become
“and the way we will always do it around here”

- Most large research infrastructures have adopted a “national laboratory” culture
  - Started with the original US National Labs in the 1940’s
  - A science/university way of working applied in a civil service (government/ministry) environment

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Many positive features if used well:

- Aims to be a *collaborative meritocracy*
- Focus on excellence
  - guarantees highest quality science outputs
- Openness to ideas
  - "who's right" rather than "who's in charge"
- Over-rides national loyalties and customs and fosters loyalty to the project
- Promotes transparency and open information flow
- Helps to build a strongly motivated workforce
- Consensus on a default working language

But to retain the benefits we must remember that this culture also has some drawbacks:

- Civil service heritage – can be very bureaucratic
- The culture imposes its own hierarchies
  - Scientists >> engineers >> technicians >> administrators
- “Academic freedom” can be overstated
- Does not always talk government language or support government priorities such as socioeconomic impact
- Not as gender-blind as it would like to think
- Can create competition with other facilities
  - Not always constructive
- Does not always respect the need for external expertise
  - After all, scientists can do anything!

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An example

"Imagine our professional pride … at the latest associate director having no more than a Bachelor's degree"

Letter from unhappy scientist at Lawrence Livermore National Lab

APS News September 2010

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Leadership

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Leadership in a scientific context

- Scientific projects require a combination of vision and practicalilty – idealism, pushing the technical and scientific boundaries, while delivering what we promised
- Different skill sets needed at different times
  - Scientific vision to develop the concept
  - Political skills to get agreement to go ahead
  - Engineering and project skills to build
  - Management skills to run the facility

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Leadership in a scientific context

- Collaborative meritocracies, such as those in large scientific infrastructures, are made up of people who don't want to be managed, they want to be led
- The role of the leader is to create an environment in which individuals have a sense of autonomy and yet are focused on the collective goal

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Leadership in a scientific context

- Within the culture I've described, there's a strong preference for the top level leadership to be someone who is seen as a scientist
  - Able to describe and evangelise the vision
  - Able to motivate the team, build personal loyalty (because building institutional loyalty to a new project takes much longer)
- … but the skills needed are not actually *typical* of scientists

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Some key attributes

- Knowing when to compromise the scientific goals of the project
  - e.g. when to descope in order to stay within costs and maintain political support, and how to explain this to the staff
- Knowing when to step back and bring experts in
- Effective team working requires more than just bringing the smartest people together
  - “The Apollo Syndrome”

Some key attributes

- Our projects are full of highly intelligent people – must treat staff with honesty and respect
- Scientists are not always good at processing their own emotions. This makes empathy and effective communication skills more important than ever: effective leaders must balance their cognitive skills with good emotional awareness

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