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CAREER Workshop Presentation

Intro

- James Howison @jameshowison
- PhD 2009 Syracuse University, Post-doc 2009-2011 CMU
- Social scientist, but I think a deep understanding of technologies is key
- I study:
  - The work of building software
  - Especially how we work together differently when we build things out of 1s and 0s.

Alerts

- n = 1
- Anecdote alert
- Selection on the dependent alert
- But: a case study is an existence proof and rich detail can make it relatable.
- Today: ideas to prompt you to think and act.

My study

- What happens at the end of a software grant?
  - Abandonment? Commercialization?
    - Or: transition to an active open source project?
- What actions can PIs take, during their grant period, to help build active communities?
- If transition is not successful, what can we learn?

Project element	Y1	Y2	Y3	Y4	Y5	Goals	Illustrative Activities
Initial Cases (6 letters of commitment)						Develop baseline understanding of transition antecedents. Narrative history of project changes, Y5: return to examine impact of any new grants.	10-15 interviews per project (~80 total). Recover history of source code. Analyze transcripts, websites, mailing lists (~250 pages per project). Develop content coding scheme and code. Member checking for validity.
NSF SISI Panel Study						Identify factors shaping decision to abandon attempt. Test hypotheses developed in initial case studies.	Build rapport (see main text). "Crash team" to capture material before destroyed. 10-15 interviews per case (6 cases likely). Analysis as above.
Source code repository Study						Identify metrics to quantitatively indicate a) project change, b) patterns of collaboration, c) best practices.	Locate and track repositories of ~50 NSF SI2 funded projects. Clean and parse logs. Design algorithms to identify patterns. Cross-reference with interview data for validity.
Theory Development						Theorize on necessary and/or sufficient conditions for peer production success in science. Understand role of scientific reputation in motivating collective activity	Analysis of narratives in both case study phases and source code data. Constant comparison with existing and new literature. Consideration of alternative explanations, testing interpretations with studied projects
Paper preparation and dissemination (illustrative)						Publish and disseminate findings, both to organization sciences and to cyberinfrastructure practitioners.	I publish both shorter papers (6-12 months writing and review), and org science papers (35 pages, 2-3 rounds review, 1-2 years to publication.
Doctoral Mentoring						Take 1 student from enrollment to graduation and employment in infrastructure studies academic position	Y1&2 student helps in interviews, builds source repository analysis skills. Student dissertation of mentored independent work in SISI panel study cases. Meeting, writing, support.
Short Courses (Software Carpentry/ TACC)						Develop, contribute, disseminate modules on organization of scientific software projects.	Development begins immediately. Y1&2 will involve "training the trainers". Y3&4 course will be delivered by Software Carpentry. Y5: return to initial participants to identify impact of training.
"Managing Open Projects" semester course						Develop and deliver semester long course for students across UT Austin.	Prepare curricula materials, invite guest speakers, prepare evaluations. Delivering course takes 10 hours a week.
Science Exec Ed Harvard Style cases						Publish formal business case on transitioning scientific software project.	Formal cases involve ~25-30 pages of tested materials: background, student role sheets, discussion guidance, event and strategy reaction sheets. Equiv. to large research paper.

Shading shows intensity of effort

Preparation

- Not my first time writing an NSF grant
- I had privilege of serving on a couple of review panels beforehand.
- Also met with NSF Program Officers, but the best interactions were at topical workshops
- Previous research had built credibility with research subjects and likely reviewers

How I write grants

- 2-3 Months out:
  - Review call in detail and examine previously funded grants (I assume ~50% of reviewers were previously funded in that program/ division.)
- Build draft budget with our finance people
- I always begin with Project Summary

Drafting a Project summary

- Starts as a ~2 pager
- 3 months out (~end of April)
- 2–3 drafts, then circulate to friends and mentors
- Interview them afterwards:

1. Do they understand what I will do?
2. Do they think it's worth doing?

Tell the *story of the research:*

- What do we want to be able to do (practice or theory)?
- Why can't we do it yet?
- What I'll do, concretely
- Why my work will help

Summary becomes outline

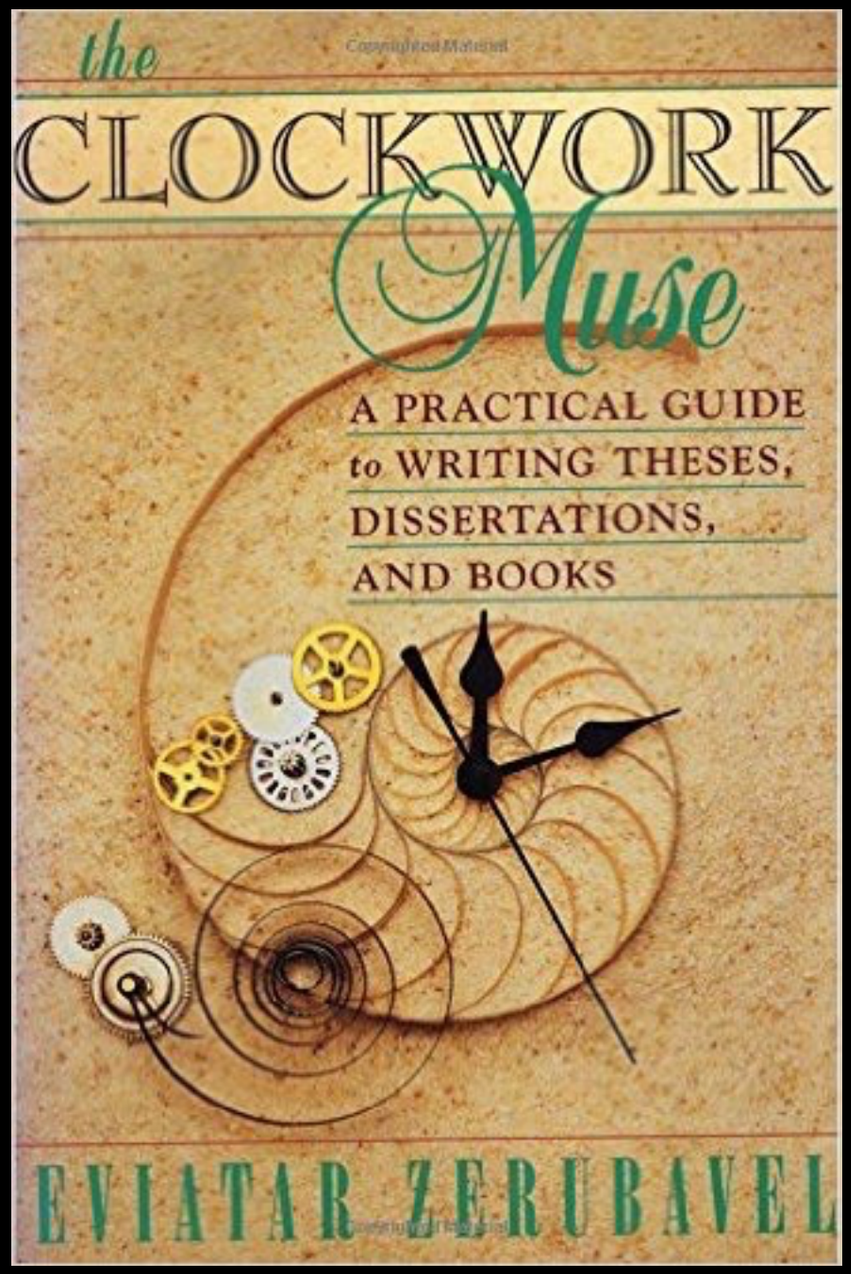
- Each section has a page budget, with cumulative total
- Outline has sentences about what each part (and sub-part) must accomplish
- Work on turning sections into full text
- Every couple of days, review and synchronize Summary and Outline/Budget with full text.
    - Are the sections/sub-sections accomplishing their goals? Which are too long? Shorten or take from another section?

Outline with page budgets

Section	p	cum.
Grand tour: problem, method, qualifications, expected contribution, include timeline graphic.	3.5	3.5
Convince them even if only section read.		
Literature and previous research	5	8.5
Build credibility, build analytic lens, show my previous work		
Research Plan	3	11.5
What, concretely, will I do? Convince sufficient.		
Education Plan	3	14.5
What, concretely, will I do? Convince possible.		
Conclusion: intellectual merit/broader impacts	0.5	15

My writing day

- From “The Clockwork Muse” (Zerubavel, 1999)
- My goal:
  - Write immediately on sitting down
  - Pick a section, review outline statement about what it must do, begin writing. Let it flow.
  - Separate your “inner critic” to avoid deletion and cycling
- I write for ~2 hours every morning, anything more is a bonus.



Managing your “inner critic”

- Our training is in reading critically; this can interfere with writing, forcing us to cycle over the same paragraph.

- Constant deletes and re-starts make it hard to know whether an approach works.

- Keep a separate document open (mine is called “nasty things”) and fill it with vicious criticism of your own writing.

—> But don’t stop writing!

- A day later, after you finish, review what you wrote and your criticisms. Re-assess, plan changes, then make them.

2013: First try

- Summer at end of my 2nd year as faculty
- Sketched ideas during semester, but only began writing in June. Too late.
- Still working on final draft day of submission.
- No pilot data.

Interpreting reviews

- Give yourself a few weeks to calm your emotions
- 3 Questions to ask yourself:
    1. Did they understand? (communication/writing)
    2. Did they think the problem worthwhile? (justification)
    3. Study and method appropriate/sufficient?
- Poor, Fair, Good tend to fail on first two, VG or E tend to fail on method and scope.

2013 reviews

- Split reviews: 1 Poor, 1 Fair and 1 Very Good, 1 Excellent.
- Panel summary: "*In the panel discussion there was some controversy …*" but clearly the negatives won out.
- I paid most attention to negative comments of otherwise good reviews (VG and E). Primarily: under scope and lacking detail.
- For Poor and Fair - What didn't they understand? Why not? Is it about being clearer?
    - My worst reviewer simply did not think my approach is research and thought the question was trivial. Nothing to be done there.

Responding

- Consulted friends who had been successful and I thought were likely to have reviewed CAREERs (even in other divisions)
- Shared my reviews with them (and sketches of my planned response). Major feedback was:
  - Tighten focus (remove one RQ and body of literature)
  - Increase breadth (to balance depth) be more ambitious
  - Provide pilot study to demonstrate method and results

2014 try

- Planned to submit to 2 divisions (SciSIP and ACI/CISE). Spoke with program officers in both divisions. Balancing act (same text).
- I had started my pilot study in Fall 2013 (before seeing reviews)
- Added a panel study (increased effort by ~25% overall)
- Again began with a 1-2 pager which I circulated, then outline.
- Obtained letters of commitment much earlier (~1 month out)
- Had near-final draft (and budget) 1 week out from Texas review deadline. Had a colleague read complete draft. Completely finished 2 days before. Very odd feeling.

2014 Result

- Declined by one division, funded by the other. You only need 1!
    - Do check with Program Officers (in Nov) that both are considering it.
- Decline reviews: G, G, VG, VG
    - Key concern: (still) under-scoped for CAREER, compared to other in that program.
        - I was invited to submit as research only “regular 3 year grant”
        - Probably would have changed topic for 3rd try.
- Funded reviews: all Excellent
    - Understood urgency and relevance of the question.
    - Understood depth and value of cases, as well as breadth of panel study
    - Liked innovativeness of Education component (cases especially)

Best advice I received

1. Do a pilot study (that's what startup funds are for!)
2. Have a clear timeline graphic around page 3.
3. How to talk to Program Officers:
    - Your goal is to gain insight into how panel members might react (topic, justification, method, and scope)
    - Don't say: "Should I do X?"
    - Do say: "How do you think a panel might react to X?"