Informatics Project Proposal (IPP)

Lecture 5: Project Planning

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Björn Franke, Aurora Constantin

Based on materials from Mark van Rossum, Rick Dewar, Stuart Anderson & Aurora Constantin
Overview

- Project Planning (Björn)
- Project Planning Tools (Aurora)
- Risk Assessment & Mitigation (Aurora)
- Planning your Dissertation Writing (Björn)
- Q&A (Aurora, Björn)
Project Planning
Why Plan?

- Predict start or end point of project
- Enable communication
- Highlight problems early
- Help manage risk
Project Constraints

- All projects operate under constraints
  - Time, cost, quality, …
- What are the constraints on your project?
Project Management Process

- Iterative process!
- Review earlier stages as project progresses
  - Identify stakeholders
  - Define the scope
  - Identify the tasks
  - Identify the risks
- Plan
- Implement
- Review
Scope

• **What is it you are aiming to achieve?**
• Does your understanding of scope agree with that of your supervisor?
• Clarify ambiguities
Identify the Tasks

- **What do you need to do?**
- Break down the scope into easily achievable tasks
- Drill down technique, but also flowchart or mind map
Identify the Risks

• What could go wrong?
• What is the worst thing that could go wrong?
• How likely is it to go wrong?
• What’s your plan to minimise the impact if it happens?
Plan

- Work out which order the tasks need done in.
- Can you have more than one task on the go at any time?
- Gantt Chart
Implement

- What problems do you have in implementing the plan?
- Change the plan to reflect this.
Review

- Check your progress
- Identify what is going wrong
- Change the plan before it is too late
- Let the stakeholders know
- Be honest!
Time Management

Prioritising your activities – The Planning Square

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

Urgency

Importance

**Dealing with the tasks:**

- Quadrant 1
  - do these first and do them well
- Quadrant 2
  - plan these carefully and do next
- Quadrant 3
  - try to delegate, then turn full attention to 2
- Quadrant 4
  - bin these (or reward yourself with them)
Developing Professional Working Relationships

- Clarify
  - Your responsibilities
  - Your supervisor’s responsibilities
- Keep structure to meetings
  - Clear purpose, record actions/decisions
Realities

• All projects are unique
• None will run exactly to plan
• All involve people
• Project Management involves change and decision making - people like neither!
• A structured approach & tools make things easier
• Do not be a slave to your plans
  • They should be living artefacts
  • Change them as necessary
• All projects have an element of risk
Project Planning Tools
Gantt Charts

- Named after Henry Gantt
- Around since 1st World War
- Common **graphical representation** of plans
- Can show **critical path**
- But not great at showing precedence
- Easy to construct and interpret
**Example**

<table>
<thead>
<tr>
<th>CLEF INC: Summer Concert</th>
<th>People Assigned</th>
<th>% Complete</th>
<th>July 2018</th>
<th>August 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Book Musicians</strong></td>
<td></td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Email bands</td>
<td>George</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preview bands</td>
<td>George</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decide on bands</td>
<td>George</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Review contract</td>
<td>Band, George</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negotiation</td>
<td>Band, George</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Band contract signed</td>
<td></td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Venue</strong></td>
<td></td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research available venues</td>
<td>Katie</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venue site visits</td>
<td>Katie</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decide on venue</td>
<td>Katie</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Review contract</td>
<td>Katie, Venue</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venue contract signed</td>
<td>Katie, Venue</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Promotion</strong></td>
<td></td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Website</td>
<td>Jeremy</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Email blast</td>
<td>Jeremy</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radio ads</td>
<td>Brittany</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facebook ads</td>
<td>Brittany</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tickets</strong></td>
<td></td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setup Ticketmaster</td>
<td>Martha</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ticket sales open</td>
<td>Martha</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ticket sales close</td>
<td></td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Concert</strong></td>
<td></td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concert night</td>
<td>Band, Venue</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Critical Path

- The **chain of sequential activities** that determines the **minimum time required for the project**
- Passes through activities with least slack
- **If you mess with critical tasks, you mess with the project’s end date!!**
- You might wish to show the critical path on your Gantt chart.
Example
Your Gantt Chart
Mind Map

- Useful at the earliest stage of a project
- Set out all possibilities and issues
- Helps gives structure to project
- Makes linkages more evident
Another Example

Why am I doing research?

Why is this project happening?

How is it happening? (methodology)

Who will benefit?

Challenges

for me

project

the future

risks

impact
Drill Down

- A technique to identify all tasks associated with a project
- Start on the left hand side with the project objective
- Identify obvious tasks
- Break these down into smallest parts
- List questions or points to clarify
'Record' bank robbery in Brazil

Thieves in Brazil have stolen up to $65m (£36m) after tunnelling into a bank in what police say could be the country's biggest bank heist.

The thieves dug a 200m (656ft) tunnel into the bank from a nearby house in the northern city of Fortaleza.

Neighbours said between six and 10 men worked at the house, rented in the name of a company making artificial turf.

The theft happened over the weekend, but was not discovered until Monday morning because the bank was closed.

Neighbours reported seeing vanloads of material being removed each day.

"It's something you see in the movies... They dug a tunnel that goes underneath two [city] blocks. They've been digging for three months," investigator Francisco Queiroga told the Reuters news agency.

The Banco Central said the robbers opened five containers with 50 real ($22) bills.

The value of the stolen bank notes has not been determined. However, police sources said the heist may have yielded as much as 150m reals, which would make it the biggest bank robbery in Brazil's history.
Example

Rob Bank and get away

Get into vault

Get away

Research what is in vault

Get a job in bank

Involve a bank insider

Use press and financial knowledge

Buy house nearby

Dig tunnel

How will money be laundered?

Where do we lie low?

Set up business to hide soil removal

Get plans of building

Buy construction equipment

Will the cash be identifiable?
Where will we buy construction equipment?
Has anyone done this before?
Risk Assessment & Mitigation
Why?

- We may have a plan, but there are events beyond our control, or simply unforeseen
- Impossible to eliminate risk completely
- Risk taking is human nature
Risk Management

- Risk: the *chance* of *adverse consequences* occurring
  - Risk = Probability * Impact
- Risk is *inherent* and *inevitable*
  - The degree of risk varies widely
- We need to know:
  - what risks are there?
  - how likely are they to occur?
  - what will their impact be if they do?
  - what can we do to minimise their occurrence?
Consequences of Risk

- **Lack of time** to fix problems, investigate issues, develop solutions, etc.
- Grumpy supervisors/markers
  - Lower marks than expected
- Stress, heroics and late nights
Prediction & Control

- **Predicting Risk**
  - Your experience
  - Your supervisor’s experience
  - Simulations
  - Feasibility study: Experiments, prototypes
  - Planning
- **Controlling Risk**
  - Contingencies
  - Planning
Risk Map

- **Eliminate** (High probability, High impact)
- **Mitigate** (Medium to High probability, Low to Medium impact)
- **Recognise** (Low to Medium probability, High impact)

**PROBABILITY**
- Low
- Medium
- High

**IMPACT**
- Low
- Medium
- High
Risk Plans

- **Alternative plans** when things go wrong
- Prepared in advance
- Work through each activity
  - what could go wrong?
  - what are the consequences?
Risk Evaluation

- For any project we should attempt to identify the risks and quantify their potential effects.

- One common approach is to construct a project risk matrix utilising a checklist of possible risks and to classify each risk according to its relative importance and likelihood.
Example

<table>
<thead>
<tr>
<th>Risk</th>
<th>Importance</th>
<th>Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborators uncooperative</td>
<td>H</td>
<td>M</td>
</tr>
<tr>
<td>Requirement X proves impossible to implement</td>
<td>H</td>
<td>L</td>
</tr>
<tr>
<td>Task Y takes longer than expected</td>
<td>L</td>
<td>M</td>
</tr>
<tr>
<td>System performance poor</td>
<td>L</td>
<td>M</td>
</tr>
<tr>
<td>Show-stopping requirement emerges late on</td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>License period ends</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Supervisor leaves</td>
<td>L</td>
<td>H</td>
</tr>
<tr>
<td>Tool unavailable</td>
<td>H</td>
<td>H</td>
</tr>
</tbody>
</table>

• Often, each risk will have an associated contingency plan.
Risks to watch for...

- New domain, skills acquisition
- Late availability of resources (data sets, ...)
- Overestimating your productivity
- Unspecified qualitative requirements
- Growing feature/bug list
- ...

...
Planning your Dissertation Writing
Tips

• Start early!
• Write on-the-fly!
• Completeness before perfection!
• Iterative cycles ("evolutionary prototyping")
• Seek feedback from your supervisor on individual chapters as you write them
• Talk to your supervisor!