Seeing The Road Ahead
(The art of presenting schedule data effectively)

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Agenda

• The Problem
• Pre 1957 (before CPM)
  – Barcharts, Flowline & Milestones
• Post 1957 (after CPM)
  – Mainframe and Mini Computers
  – Manual Alternatives
  – The use of Graphics
• Summary and Conclusions / Recommendations
The Problem

- Project data is complex
  - What section of the work = Each activity?
  - When should it be done?
  - What are the dependencies?
    - Before and after?
    - In parallel (allowed / not allowed)?
  - Who is going to do the work (and how do they know what’s expected)?
  - What are the constraints?

The Problem

- Option 1 – sort it out as work proceeds
  - Use intuition and experience
  - Works for non-complex projects
- Option 2 – plan the work in advance
  - Needs a mechanism for doing the planning
  - Needs a process for communicating the managers intentions
    - To allow people to add value to the process
    - To inform the workers what needs to be done
The Problem

• Effective planning has been done for 1000s years
  – China: Great Wall, Grand Canal, Beijing
  – Pyramids
  – Military campaigns
• Records are limited
• Amazing outcomes

The total length of the Grand Canal is 1,776 km

Crystal Palace

From a rough sketch on blotting paper to the Great Exhibition of 1851 – How long?

Royal patronage probably helped!!

The Crystal Palace is:
1848 feet [563.3 m] long,
408 ft [124.4 m] wide and
108 ft [32.9 m] high.
New technology - Prefabricated cast iron was used extensively
**Crystal Palace**

The Crystal Palace was built in eight and a half months starting on 15 July 1850, opening on 1st May 1851.

How long does a modern shopping centre take to build?

**Empire State Building**

- **Steel Delivery Schedule**
- **Completed on 11 Apr 1931**
- **The frame rose at the rate of four and a half floors per week**
- **103-story structure completed in 1 year & 45 days (13+ months)**
Pre 1957

- Barcharts
- Flowline
- Milestones

Barcharts

Joseph Priestley 1765

“...a longer or a shorter space of time may be most commodiously and advantageously represented by a longer or a shorter line.”

William Playfair (1759-1823) ‘Commercial and Political Atlas’ of 1786. Playfair is credited with developing a range of statistical charts including the line, bar (histogram), and pie charts.
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Barcharts
Karol Adamiecki 1896
Harmonogram or Harmonygraph

From Schurch 1916: p35
Project date 1912

Henry Gantt published:
Work, Wages, & Profits in 1916

Flowline

The basic technique has many variations and names
- Location based scheduling
- Flow Line
- Chainage Charts
- Elemental Trend analysis
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Flowline
Section of a pipeline project - TILOS time-location planning software

Long History:
1930s – empire State Building
1940s – US Naval Dockyards (LoB)
2000s – Location Based scheduling – Russell Kenley
2010s – TILOS and other ‘Chainage Charts’

Milestones

• Milestones appear in the 1940’s

• The concept of **Crashed Schedules** loaded with additional resources to achieve Milestones can be traced to at least 1947
Post 1957

- Mainframe and Mini Systems
  - CPM / PERT
  - Precedence
- Manual Alternatives
  - Hand drawn networks
  - Planalog
- Text based PC Systems
- Modern graphical tools

Jim O’Brien: I always joked that the Navy stole the game, but Kelley and Walker stole the name.
Post 1957

CPM & PERT - 1957

Kelley: “When I had to explain to DuPont’s management what this scheduling approach was, they couldn’t understand the algorithm so I used the arrow diagram. I developed the arrow diagram to show them what the algorithm was saying.”

Jim O’Brien: I always joked that the Navy stole the game, but Kelley and Walker stole the name.

Mainframe and Mini Systems
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Manual Alternatives

- Lower costs
- Quicker turn-around
- Better presentation
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Manual Alternatives

- Better visual representations of progress

Planalog

- Manual display systems

Mechanical or Magnetic Display Systems

United States Patent Office

Text based PC Systems

- Similar to Mainframes & Mini Computers
- A fraction of the cost
- Immediate analysis – plus screen displays
- Helped by dot-matrix printers

Graphical Displays

- GUIs
  - Apple Macintosh – 1984
  - Microsoft Windows – 1985
- Inkjet & laser printers
- But better tools do not equate to better communications
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Graphical Displays

What controls what??

Modern Graphical Tools

• Improvement or confusion?

Asta Powerproject
Modern Graphical Tools

• Improvement or confusion?

CASCAD-e

Modern Graphical Tools

• Correct level of detail
Summary

You have to be able to ‘see’ the information

- Luminance processing (opponent-process channels, inhibition, receptive fields)
- Edge detection (receptive fields)
- Orientation detection (receptive fields)
- Color processing (opponent process channels, trichromacy)
- Segmentation (luminance, texture, colour, etc.)

Summary

- Too much data = no communication
- Select the data to display
- Design the display to communicate
Summary

“On inspecting any one of these Charts attentively, a sufficiently distinct impression will be made, to remain unimpaired for a considerable time, and the idea which does remain will be simple and complete, at once including the duration and the amount.”

*Atlas*, 1st Ed., 1786, p.4

William Playfair

Summary

Which map is more useful
If you are looking for the Dojo

‘Useful’, ‘Accurate’ and ‘Fully Detailed’ are not synonymous and may be contradictory!
Plan your communication……
Recommendations & Conclusions

Data is not information, information is not knowledge, knowledge is not understanding, understanding is not wisdom.

Clifford Stoll

Effective reporting gets you to ‘information’ and helps with ‘understanding’

See: Beyond Reporting - The Communication Strategy

Recommendations & Conclusions

• One size will not ‘fit all’
• Use graphic design to make reporting work
• Focus the information
• Effective scheduling = communication
Recommendations & Conclusions

- One size will not ‘fit all’
- Use graphic design to make reporting work
- Focus the information
- Effective scheduling = communication

Useful schedules are useful because they are used

Recommendations & Conclusions

- Design the schedule to be effective
  - Schedule levels / Schedule Density
- Design the coding to support the reporting structure
- Design a few elegant reports
  - Standardise their use
- Focus on communication and engagement (Stakeholder management)
Recommendations & Conclusions

- Resources:
  - Free Project Planning & Scheduling resources
    - Core papers
    - Published papers
    - White Papers
    - Useful links
    - Training courses

Questions Please

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Mosaic’s Scheduling home Page