



Project Risk Management

Beyond the Risk Register

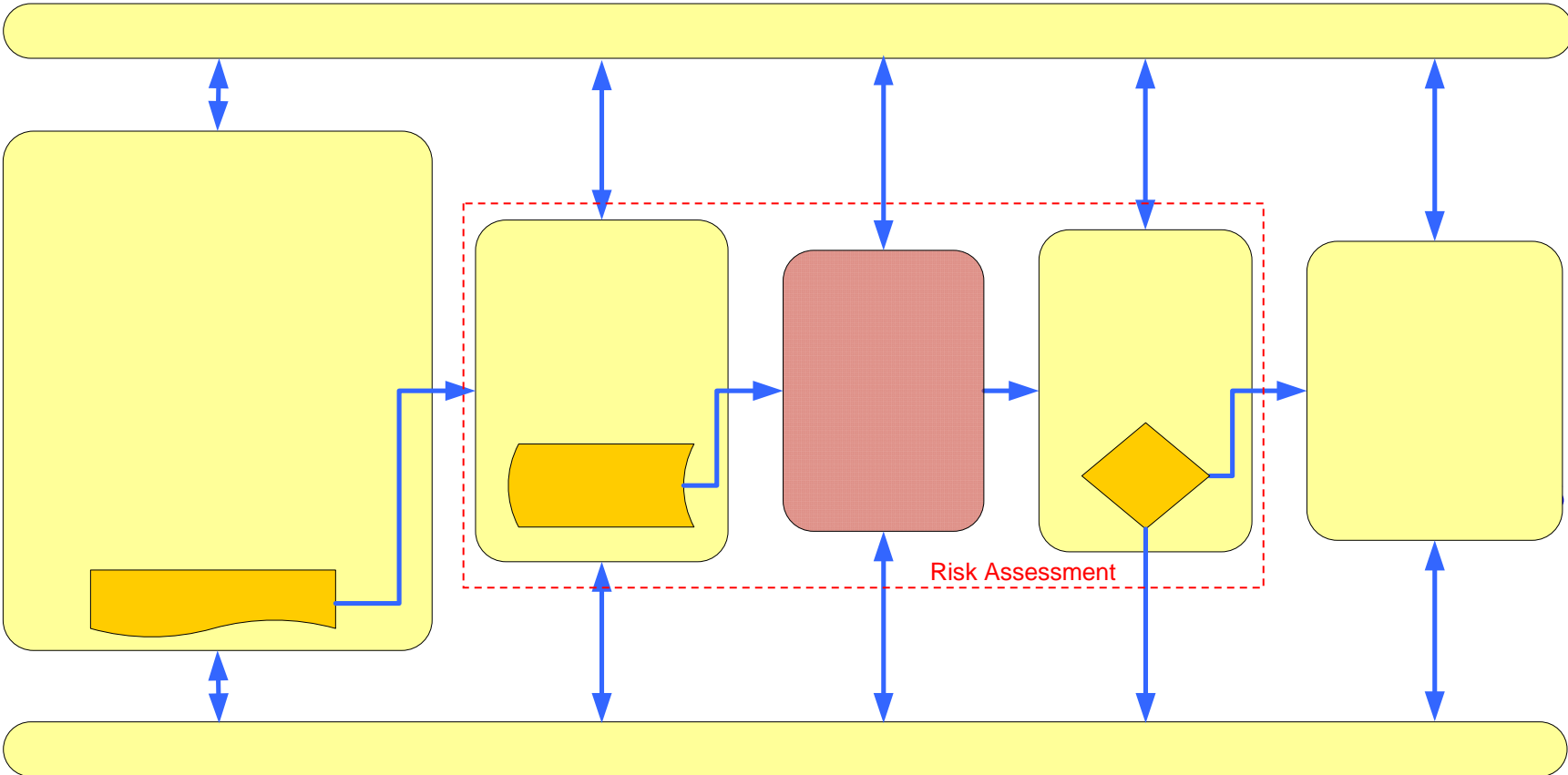
October 2008

Content

- Estimating & modelling uncertainty
 - Developing levels of confidence in schedules
- Establishing achievable targets
 - Agree schedules focused on success
- Focusing effort in the ‘right’ place to achieve targets
 - Increasing chances of success

Realistic Outcomes are Beneficial to All Parties

Risk Management Process



Establish the Context

- Set or Review Project Objectives

Three Point Estimates

Why waste time with three numbers instead of one?

- SPE are deterministic in nature and ignore circumstance where a range of outcomes is the reality.
- SPE often mask the quality of an estimate or its associated level of uncertainty – *inclusion of risks, opportunities and 'fat'*
- TPE provide verifiable data to inform management judgments such as acceptable risk profiles and assessment of management reserve.

Generating 3PEs does not take three times as long as a SPE

Uncertainty – Multiple Consecutive Tasks

		<i>(SPE)</i>	
	<i>Best</i>	<i>Likely</i>	<i>Worse</i>
▪ Excavation and Foundations	1	1	4
▪ Foundation Hardening	2	7	11
▪ Frame Construction	1	2	4
▪ Install Roofing	1	2	9
▪ Install Doors and Windows	0.5	1	3
▪ Exterior Finish Work	1	3	5
▪ Electrical Wiring	0.5	1	3
▪ Interior Finish Work	1	2	5
▪ Building Inspection	0.5	1	3
Complete	8.5	20	47

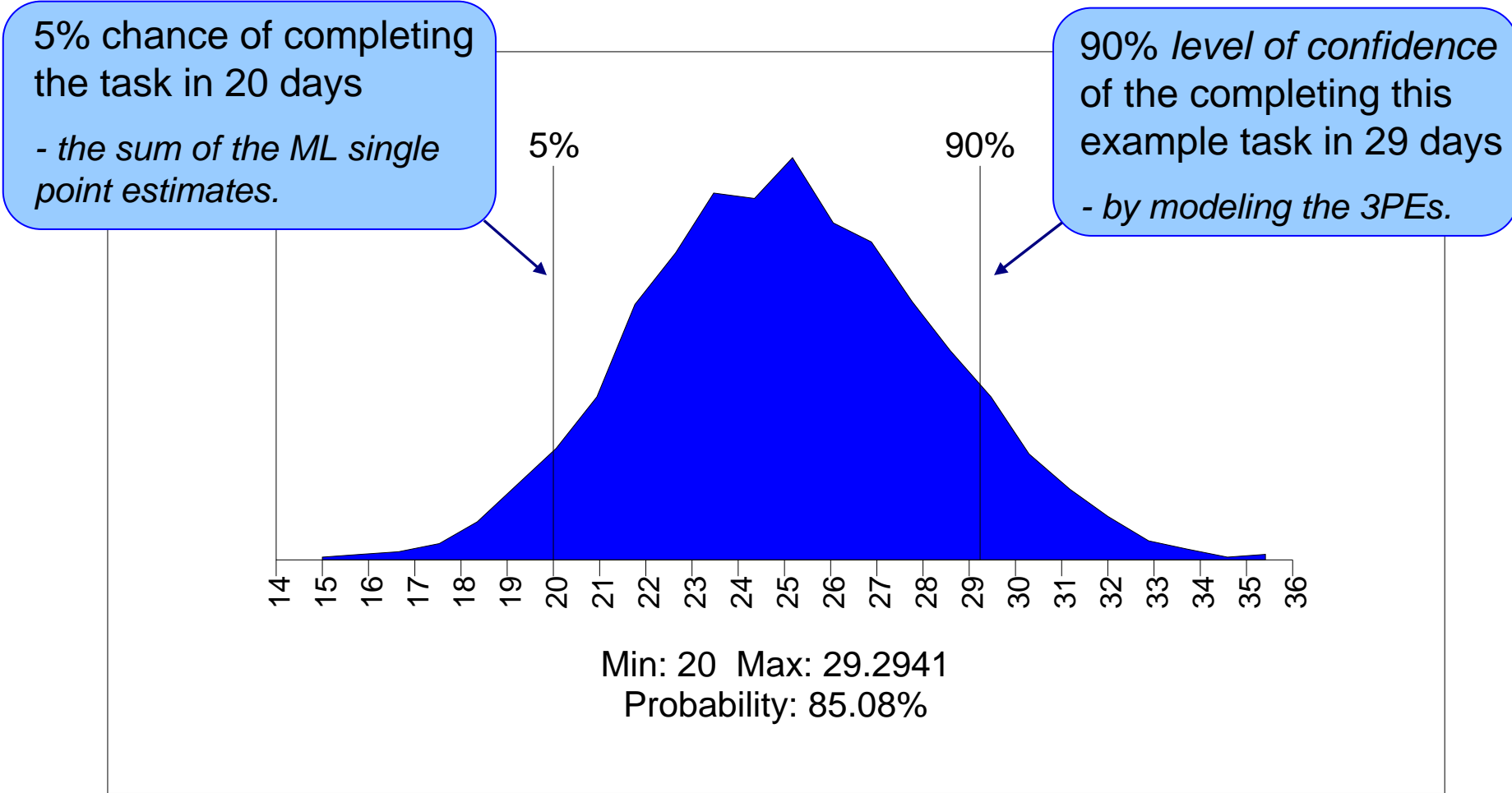
What can you derive from this info?

Uncertainty – Multiple Tasks

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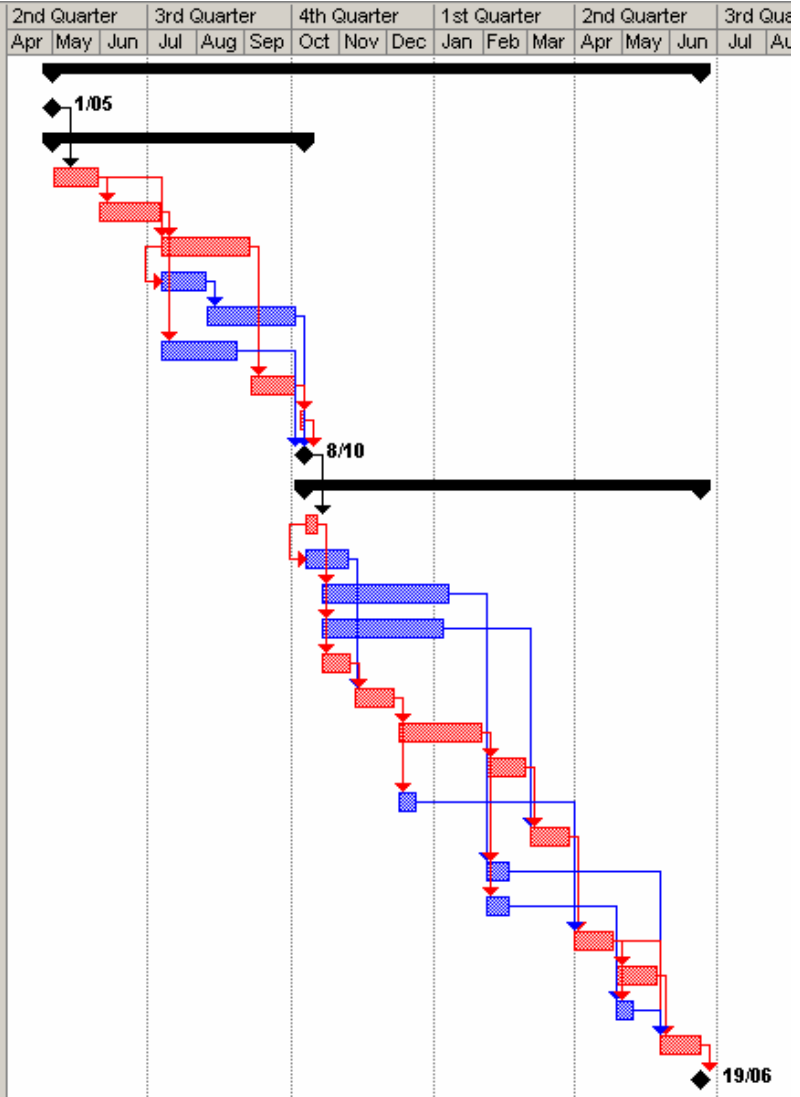
- Are there opportunities or risks ‘buried’ in the estimate?
- TPE can highlight the activities where effort should be focused to reduce time or cost.
- Allows modeling of possible outcomes.
- Avoids ‘salami slicing’ – *image these as individual projects and you need a 5% overall saving.*

Monte Carlo Model Output



Schedule Analysis

Task Name	Duration	Minimum	Most Likely	Maximum
<input type="checkbox"/> Single Storey Building	297 days	0 days	300 days	0 days
Start	0 days	0 days	0 days	0 days
<input type="checkbox"/> Design & approvals	115 days	0 days	119 days	0 days
Preliminary Design / Cost Estimate	21 days	14 days	21 days	35 days
Planning Approval	28 days	14 days	28 days	56 days
Detailed Design	42 days	35 days	42 days	56 days
Building Regs Lag	21 days	21 days	21 days	21 days
Building Regulations	42 days	42 days	42 days	70 days
Mortgage Application	35 days	14 days	35 days	35 days
Tender Construction Contract	21 days	7 days	21 days	28 days
Review and Award Contract	3 days	2 days	3 days	4 days
All Permissions in Place	0 days	0 days	0 days	0 days
<input type="checkbox"/> Construction	182 days	0 days	181 days	0 days
Mobilise to site	7 days	2 days	7 days	28 days
Match & Procure Bricks	21 days	5 days	21 days	42 days
Procure Double Glazing	60 days	49 days	60 days	91 days
Procure Plumbing /Sanitary Ware	56 days	35 days	56 days	112 days
Construct Foundations	15 days	10 days	15 days	20 days
Build Walls to DPC level	20 days	9 days	20 days	28 days
Build Walls to Roof Level	40 days	21 days	40 days	56 days
Construct Roof	20 days	3 days	20 days	21 days
Cast Floor	10 days	4 days	10 days	18 days
1st Fix Services	20 days	10 days	20 days	28 days
Fit Windows	11 days	3 days	11 days	18 days
Fit Door Frames	11 days	3 days	11 days	18 days
Plaster Walls and Ceilings	20 days	10 days	20 days	28 days
2nd Fix Services	20 days	7 days	20 days	21 days
Fit Doors	9 days	5 days	9 days	10 days
Paint	20 days	10 days	20 days	21 days
Finish	0 days	0 days	0 days	0 days

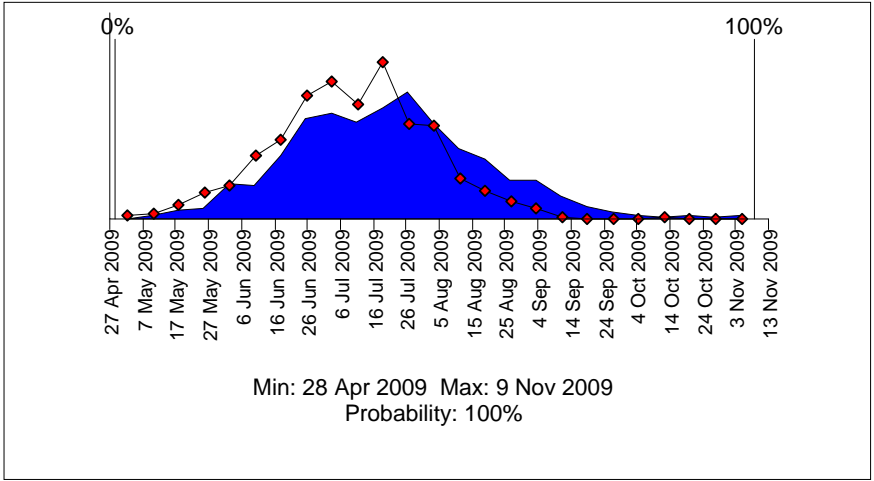
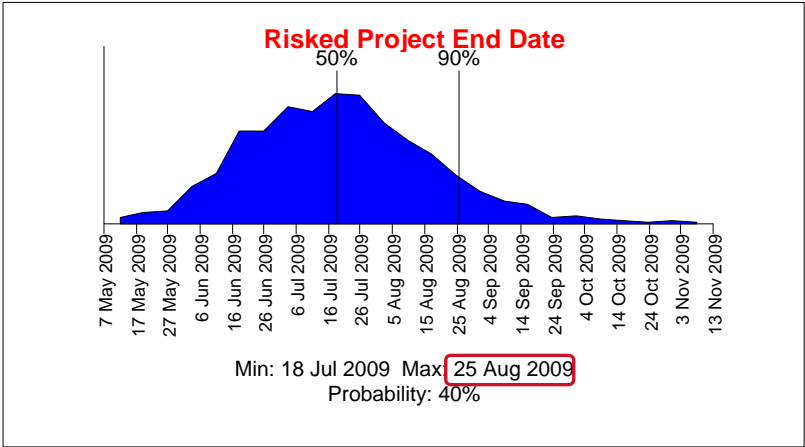
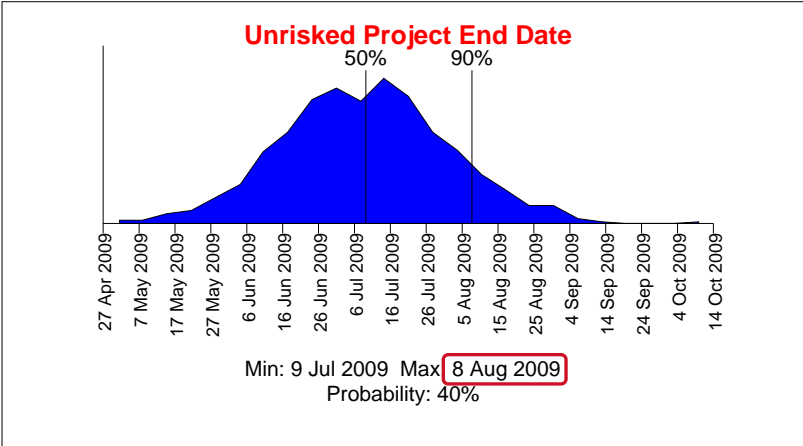


What do we get out of this approach?

Id	Activity Description	Durations			Modelled Duration	Timing		Start Critical	Finish Critical	Cruciality
		Minimum	Most Likely	Maximum		Early Start	Early Finish			
						5 Jan 2004				
1	Single Storey Building				318.6	1 May 2008	20 Jul 2009	100%	100%	100%
2	Start	0	0	0	0	1 May 2008	1 May 2008	100%	100%	0%
3	Design & approvals				138.1	1 May 2008	10 Nov 2008	100%	100%	79%
4	Preliminary Design / Cost Estimate	14	21	35	23.8	1 May 2008	2 Jun 2008	100%	100%	18%
5	Planning Approval	14	28	56	38.3	2 Jun 2008	26 Jul 2008	100%	100%	67%
6	Detailed Design	35	42	56	44.8	26 Jul 2008	27 Sep 2008	100%	27%	0%
7	Bulding Regs Lag	21	21	21	21	26 Jul 2008	24 Aug 2008	77%	77%	0%
8	Building Regulations	42	42	70	53.8	24 Aug 2008	8 Nov 2008	77%	77%	31%
9	Mortgage Application	14	35	35	29.4	26 Jul 2008	5 Sep 2008	0%	0%	0%
10	Tender Construction Contract	7	21	28	19.2	27 Sep 2008	24 Oct 2008	27%	27%	4%
11	Review and Award Contract	2	3	4	3.5	24 Oct 2008	29 Oct 2008	27%	27%	0%
12	All Permissions in Place	0	0	0	0	10 Nov 2008	10 Nov 2008	100%	100%	0%
13	Construction				180.6	10 Nov 2008	20 Jul 2009	100%	100%	61%
14	Mobilise to site	2	7	28	12.9	10 Nov 2008	28 Nov 2008	100%	78%	25%
15	Match & Procure Bricks	5	21	42	23	10 Nov 2008	12 Dec 2008	24%	24%	14%
16	Procure Double Glazing	49	60	91	67.1	28 Nov 2008	2 Mar 2009	1%	1%	2%
17	Procure Plumbing /Sanitary Ware	35	56	112	70.5	28 Nov 2008	6 Mar 2009	16%	16%	19%
18	Construct Foundations	10	15	20	16.3	28 Nov 2008	21 Dec 2008	62%	62%	10%
19	Build Walls to DPC level	9	20	28	19.5	23 Dec 2008	19 Jan 2009	84%	84%	9%
20	Build Walls to Roof Level	21	40	56	39.6	19 Jan 2009	16 Mar 2009	84%	84%	25%
21	Construct Roof	3	20	21	15.4	16 Mar 2009	6 Apr 2009	84%	84%	12%
22	Cast Floor	4	10	18	12.5	19 Jan 2009	6 Feb 2009	0%	0%	0%
23	1st Fix Services	10	20	28	19.7	8 Apr 2009	6 May 2009	99%	99%	17%
24	Fit Windows	3	11	18	11.2	18 Mar 2009	2 Apr 2009	1%	1%	0%
25	Fit Door Frames	3	11	18	11.2	16 Mar 2009	31 Mar 2009	0%	0%	3%
26	Plaster Walls and Ceilings	10	20	28	19.7	6 May 2009	3 Jun 2009	100%	100%	20%
27	2nd Fix Services	7	20	21	16.5	3 Jun 2009	26 Jun 2009	100%	100%	17%
28	Fit Doors	5	9	10	8.5	3 Jun 2009	15 Jun 2009	2%	2%	3%
29	Paint	10	20	21	17.5	26 Jun 2009	20 Jul 2009	100%	100%	10%
30	Finish	0	0	0	0	20 Jul 2009	20 Jul 2009	100%	100%	0%
Summary					318.6	1 May 2008	20 Jul 2009			

(Risks included into model against specific tasks)

Schedule Analysis (Risky & Unrisky)



- Provides a level of confidence of achieving a particular target
- Allows comparison of outcomes
- Can examine outcomes task by task
- Allows 'what if' modelling

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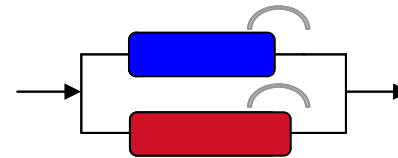
(Risks included into model against specific tasks)

Criticality & Cruciality

Assists the Project Manager in identifying activities that should be the focus of risk management attention

Criticality

- the chance that a particular task will be on the critical path - *'fuzzy' critical paths*

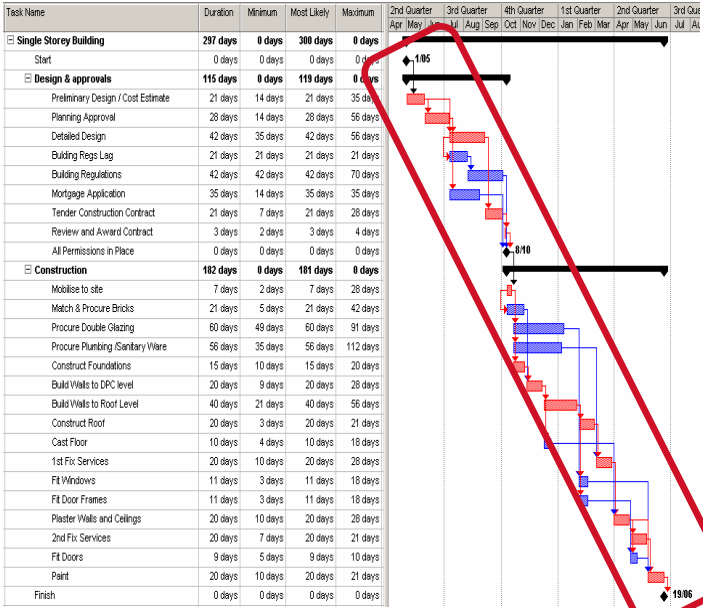
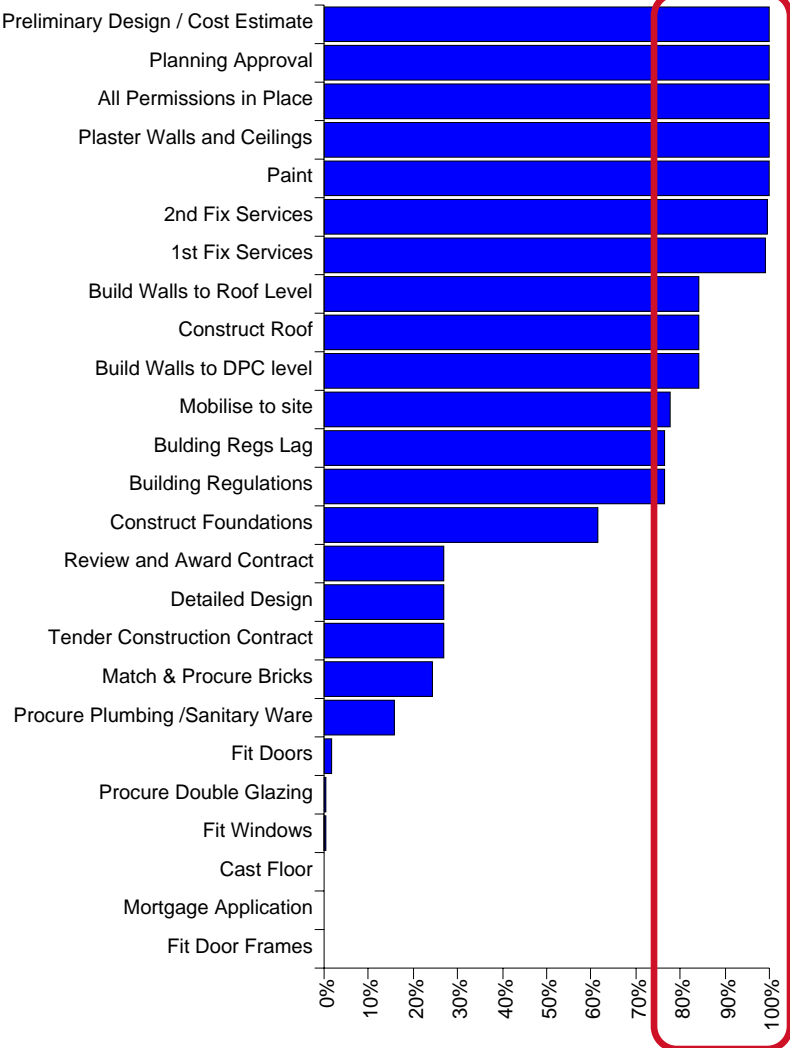


Cruciality (Sensitivity)

- correlation between an activity's duration and the project duration
- *'the chance of this task affecting the project end date'*

Focus on Task Criticality

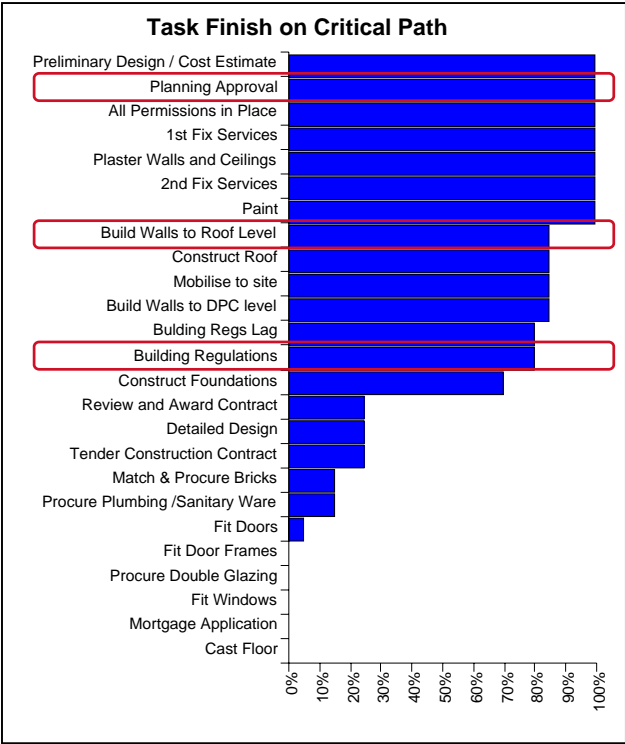
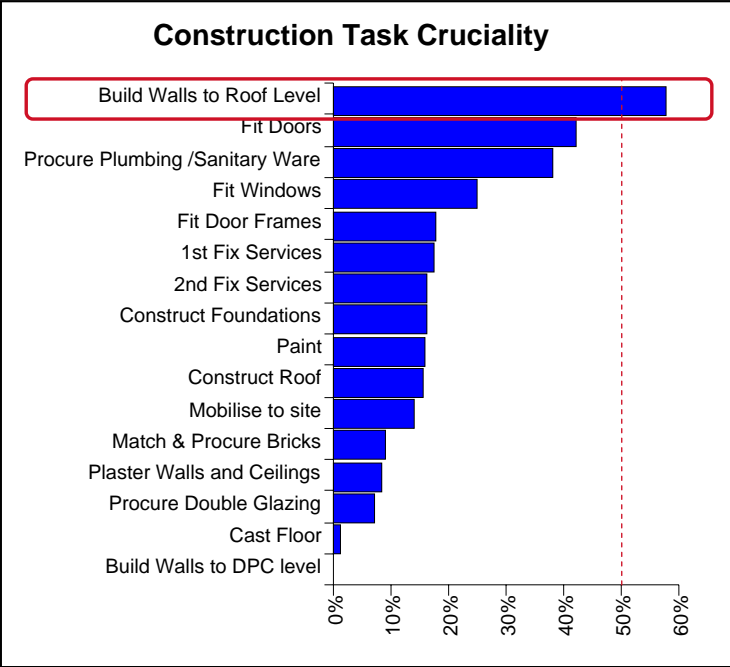
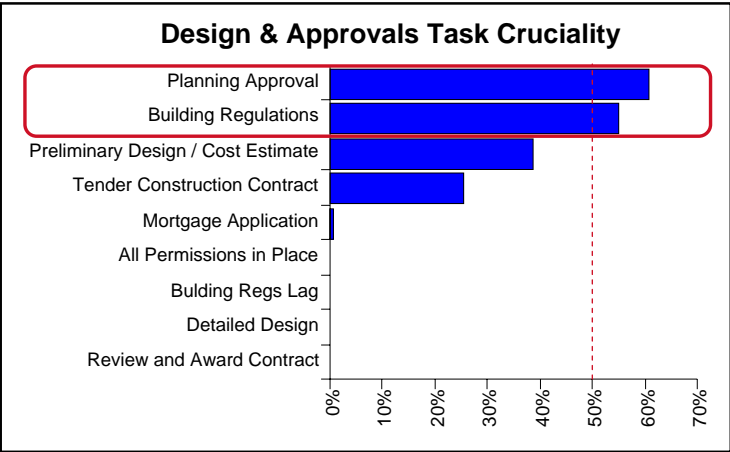
Task Finish Criticality



Both these show more than 50% of tasks are on, or near, the critical path

– Where do I focus resources?

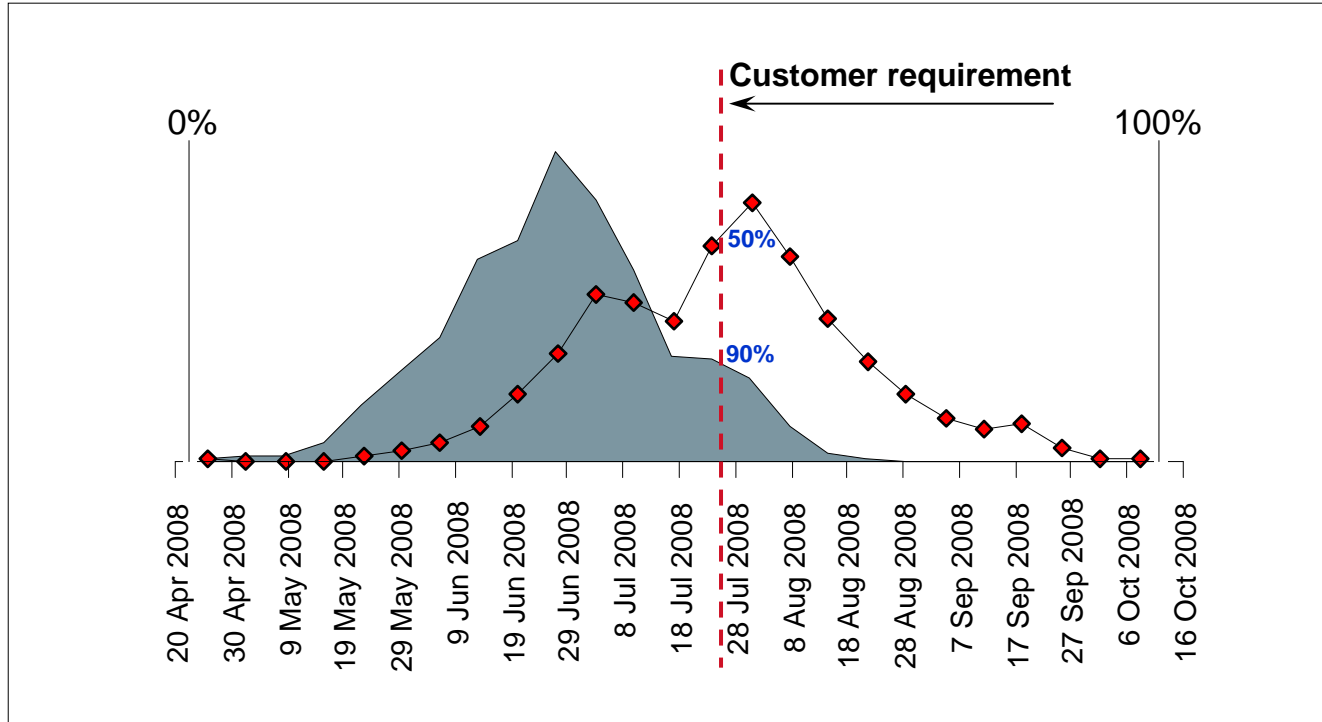
Focus on Task Cruciality



Only 3 of these 'critical' tasks are the major drivers for the completion date

These are where PM effort should be focused

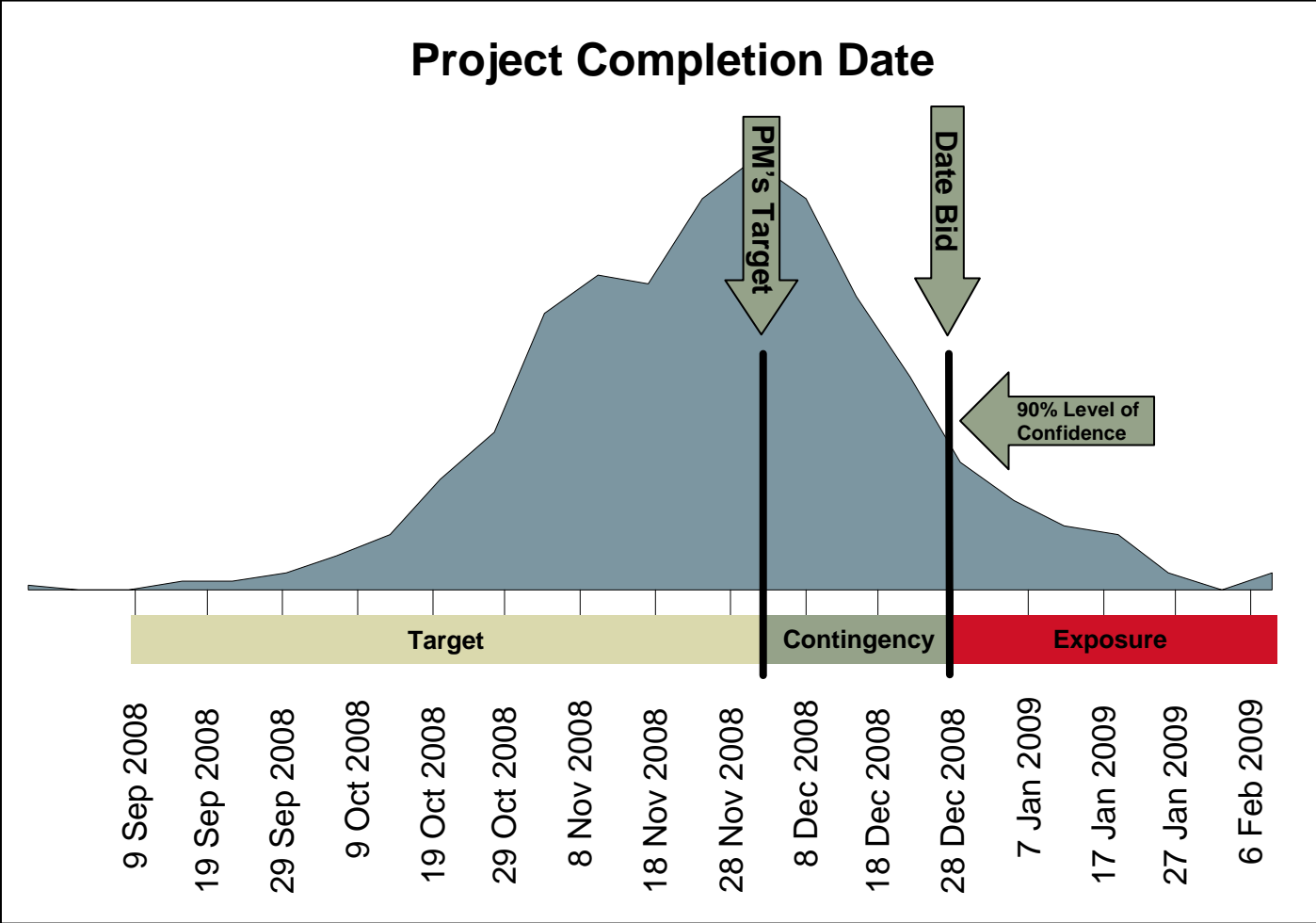
Meeting Customer Requirements



If you can:

- Reduce risk probabilities by 50%
- Plan a 50% reduction in the most crucial task duration
- Plan 20% duration reductions for the other 2 identified crucial tasks

Schedule Contingency



Availability of Data

- Model the situation
- Assess the information outputs
- Question the base data
- Run ‘what-if’ scenarios
- Make informed decisions

*Schedules require robust structure and logic **prior** to analysis*

Questions?