Mexican Association of Software Metrics

AMMS

Project Behind Schedule! What are my options?

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Project Behind Schedule!　　　　　

✓**G1.** Getting back to basics – what do people need?

✓**G2.** Comparing scenarios
　　✓Increase team size,
　　✓Cut functionality
　　✓Extend deliverable date

✓**G3.** Stimulate thoughts on how to use ISBSG data

Disclaimer

– There should also be 2 estimating methods.

– Your own data is better than anything else.

The Issues

1. What do I do when the project is not going to make deliverable date?

- Increase team size

- Reduce functionality delivered

- Extend deliverable date

2. How do I factor in the attributes that have contributed to my project?

3. What data should I select to compare my project against?

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The Obvious

- Team size

- Project size

- New technology

- Inexperienced staff

- New application domain,

- New methodology

- Deadline impossible from the start

Difficult to measure

- Team cohesion

- World events

- Seasons (cold & flu)

- Unco-operative customer

- Company culture

 .... the list is endless

Some are identifiable and others are inherent.

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Considerations of ISBSG projects to include

1. Include everything.

2. A and B rated projects only.

3. Same methodology – e.g. Impact on reducing scope might have a lesser effect on Agile projects than Watefall.

4. Similar range of team size – larger teams are likely to have the same inherent problems.

5. Similar project size.

6. Same language or platform.

Make sure data set is big enough (>25)

Project Behind Schedule!   Sample project

Functional Size: 700 function point (IFPUG)

Team size: 6 people

Duration: 7 months

Schedule Detail: 19.6 days/month, 8 hours/day., 235 working days/year
                     (10 public holidays, 5 sick days, 20 days annual leave)

Hourly rate: $100/hour

Hours/FP: 9.4

Total Cost: $660,000

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Projects selected from ISBSG Development & Enhancement database

• 7376 IFPUG, COSMIC, FiSMA & NESMA A or B quality rating

Of which

• 6535 have Elapsed Time recorded

• 2029 have Team Size recorded

• 1683 have Effort Phase Breakdown recorded where < 10 hours unallocated

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Project Behind Schedule!

Constraints

- Resource not available.

- Specialised project – ramp up time will be too long.

- Will impact already productive team members.

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Project Behind Schedule!

Scenario 1 – Increase Team Size

Team Size	N	P25	Median	P75
1	130			
2	156			
3	152			
4	169			
5	180			
6	134	7.6	10.3	22.0
7	119	7.3	12.4	20.3
8	92	7.5	13.3	27.1
9	67	9.1	15.5	26.3
10	65			
11	50			
12	37			
13	28			
14	33			
15	37			
16	26			
17	26			

Legend:
- P25
- Median
- P75
- Lineal (Median)
- Sample project

Hrs / FP

Team Size

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Constraints

• Might not be able to reduce functionality.

• Functionality to be reduced might have already been implemented.

• It might be too late in the project to reduce scope – too disruptive

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Project Behind Schedule!

Scenario 2 – Reduce Functionality

FP Size	N	P25	Median	P75
300	295			
400	396			
500	262	4.2	7.9	14.4
600	178	4.9	7.9	14.6
700	124	5.2	8.9	16.7
800	109			
900	77			
1000	36			

Project Behind Schedule!

Constraints

- Customer may not accept extension.

- Resources may not be available for an extension.

Project Behind Schedule!

Duration	N	P25	Median	P75
1	366			
2	561			
3	815			
4	727			
5	688			
6	590			
7	408	6.4	11.2	17.4
8	383	6.7	11.5	21.5
9	302	7.0	13.1	24.6
10	262			
11	213			
12	241			
13	152			
14	107			
15	113			
16	73			
17	64			
18	59			
19	47			
20	50			

Hrs / FP — Months

Legend: P25, Median, P75, Lineal (Median), Sample project

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When project change occurs is important

Phase	P25	Median	P75
Plan %	0%	0%	5%
Specify %	0%	11%	23%
Design %	13%	26%	35%
Build %	60%	71%	82%
Test %	91%	95%	100%
Implement %	100%	100%	100%

Figures are cummulative phase %s

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Method

1. Calculate cost of project until the end of Design

2. Calculate the change in productivity measure for:

    • Adding 3 resource (from 6 to 9 people)

    • Reducing the size of the project from 700FP to 500FP

    • Extending the duration from 7 months to 9 months

3. Apply new productivity measure to the remainder of the project

4. Calculate total cost.

Project Behind Schedule!   Scenario 1 − Add 3 resource

Start

FP   * Hours/FP * $/hour * %effort to end of design
= 700 * 9.4   * 100   * 26%   = $171,080

Design

FP   * New Hours/FP * $/hour * %effort post design
= 700 * 14.2   * 100   * 74%   = $735,560

Delivery

Calculate total cost   = $906,640

| From previous slide | | | | |
Team Size	N	P25	Median	P75
6	134	7.6	10.3	22.0
7	119	7.3	12.4	20.3
8	92	7.5	13.3	27.1
9	67	9.1	15.5	26.3

Increase team size from 6 to 9 decreases productivity by 51%

Calculation (15.5-10.3)/10.3 = 51%

New Hours/FP = 9.4 * 1.51 = 14.2

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Project Behind Schedule! Scenario 2 – Reduce 200 FP

Start

FP   * Hours/FP * $/hour * %effort to end of design
= 700 * 9.4   * 100   * 26%   = $171,080

Design

FP   * New Hours/FP * $/hour * %effort post design
= 500 * 8.4   * 100   * 74%   = $310,800

Delivery

= 200 * Estimated Hours/FP * $/hour
= 200 * 10   * 100   = $200,000

Next project

Calculate total cost   = $681,880

From previous slide

FP Size	N	P25	Median	P75
500	262	4.2	7.9	14.4
600	178	4.9	7.9	14.6
700	124	5.2	8.9	16.7

Reducing from 700 to 500FP may improve productivity by 11%

Calculation (8.9-7.9)/8.9 = 11%

New Hours/FP = 9.4 * 0.89 = 8.4

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Project Behind Schedule!   Scenario 3 – Extend 2 months

Start

FP   * Hours/FP * $/hour * %effort to end of design

= 700 * 9.4   * 100   * 26%   = $171,080

Design

FP   * New Hours/FP * $/hour * %effort post design

= 700 * 11.0   * 100   * 74%   = $569,800

Delivery

Calculate total cost   = $740,800

From previous slide

Duration	N	P25	Median	P75
7	408	6.4	11.2	17.4
8	383	6.7	11.5	21.5
9	302	7.0	13.1	24.6

Extending duration from 7 to 9 months may cause increase in productivity of 17%

Calculation (13.1-11.2)/11.2 = 17%

New Hours/FP = 9.4 * 1.17 = 11.0

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Comparing the 3 scenarios

Original Project	Add 3 Resource	Reduce 200 FP	Increase 2 months
$660,000	$906,640	$681,880	$740,080

Issues:

1. Cost rates would most likely vary for different project team members.

2. Reducing resource in scenario to reduce 200 FP may not be easy since new schedule may call not full-time resource. Resources not needed anymore may not have another project to go onto hence no saving.

3. The original hours/FP of 9.4 is obviously wrong since the project got behind schedule.

4. Decisions to make changes (add resource, reduce scope or increase duration) are not made overnight. There is always a lead-up to find resource or negotiate with customer.

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This presentation has demonstrated how to use ISBSG data to determine changes in productivity

Data used for this presentation was not specifically selected to match the project.

Recommend you be more targeted with the projects you select in your analysis.

ISBSG is an open database for that reason

"So you can have the power to choose what projects best fit your situation"

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