



Title: Project Behind Schedule! What are my options?

Author: HOLMBERG, Paula

Editorial label ECORFAN: 607-8695
BCNMES Control Number: 2020-02
BCNMES Classification (2020): 110820-0005

Pages: 20
RNA: 03-2010-032610115700-14

ECORFAN-México, S.C.
143 – 50 Itzopan Street
La Florida, Ecatepec Municipality
Mexico State, 55120 Zipcode
Phone: +52 1 55 6159 2296
Skype: ecorfan-mexico.s.c.
E-mail: contacto@ecorfan.org
Facebook: ECORFAN-México S. C.
Twitter: @EcorfanC

www.ecorfan.org

Holdings		
Mexico	Colombia	Guatemala
Bolivia	Cameroon	Democratic
Spain	El Salvador	Republic
Ecuador	Taiwan	of Congo
Peru	Paraguay	Nicaragua



Project Behind Schedule!

Goals of the presentation

- ✓ **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.

Project Behind Schedule!

Getting back to basics

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?

Project Behind Schedule!

The Obvious

- Team size
- Project size
- New technology
- Inexperienced staff
- New application domain,
- New methodology
- Deadline impossible from the start

2. Attributes that effects productivity

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.

Project Behind Schedule!

3. What data do I select to compare

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 Waterfall.
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

Project Behind Schedule!

Projects selected

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

Project Behind Schedule!



Scenario 1 - Increase Team Size



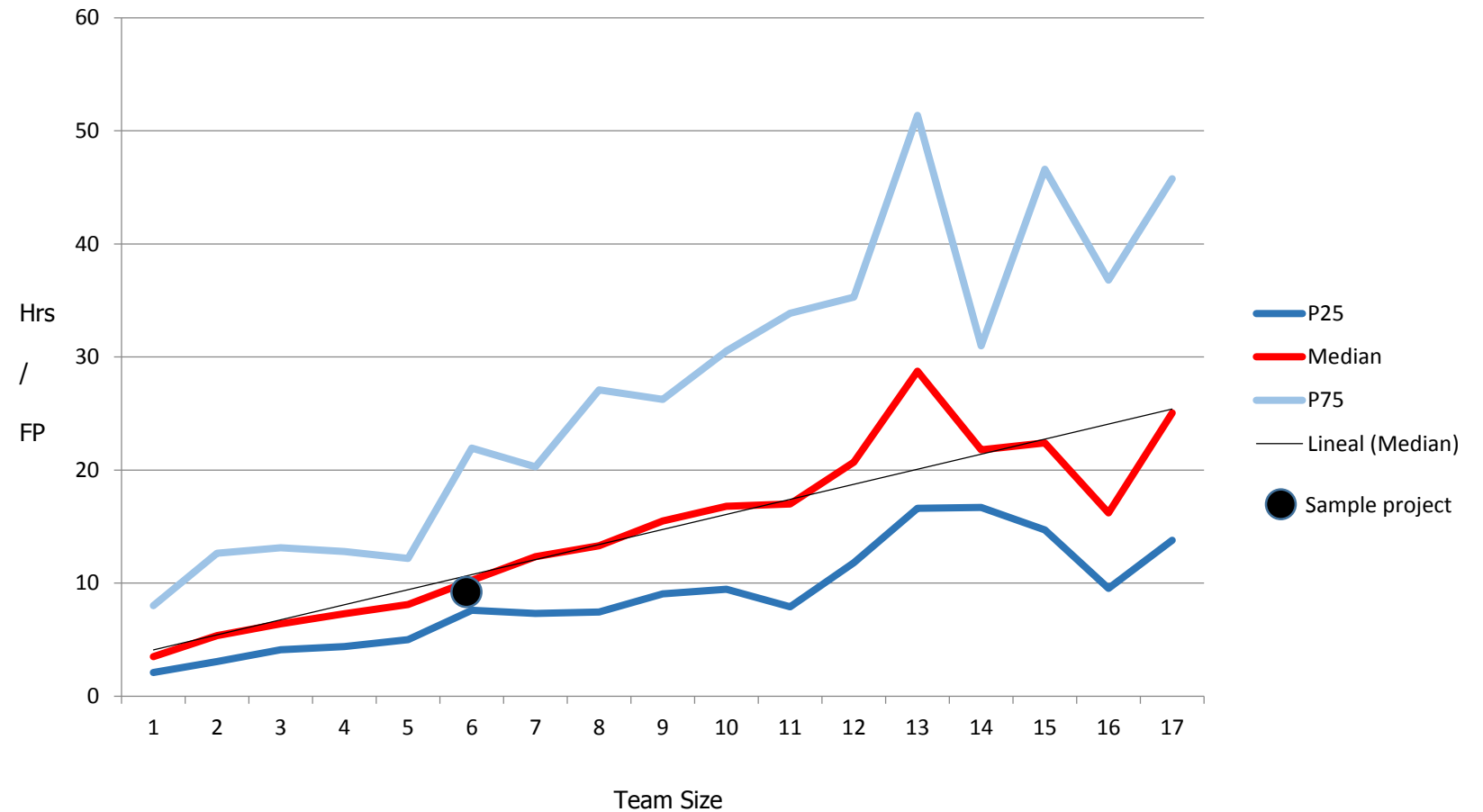
Constraints

- Resource not available.
- Specialised project – ramp up time will be too long.
- Will impact already productive team members.

Project Behind Schedule!

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			

Scenario 1 – Increase Team Size



Project Behind Schedule!

Scenario 2 – Reduce Functionality



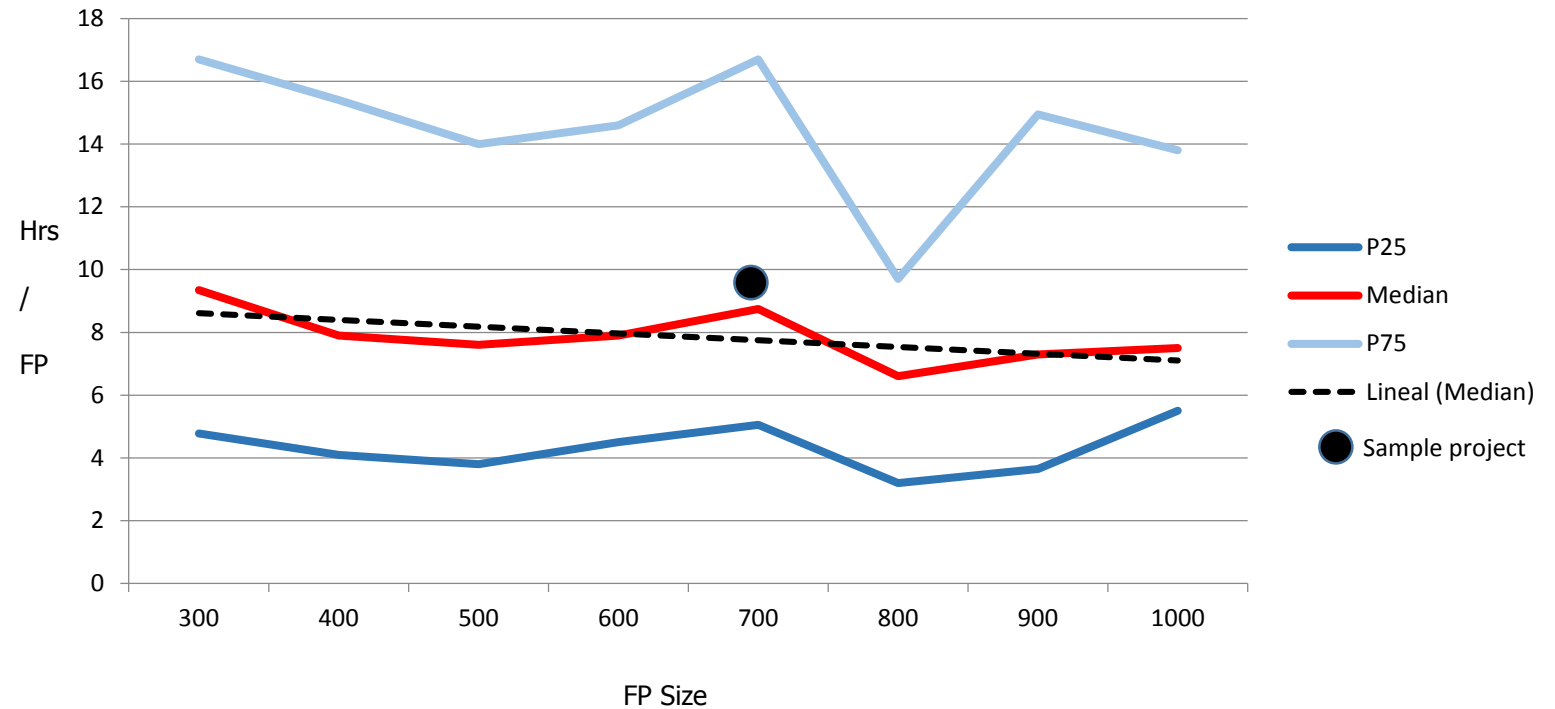
Constraints

- 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

Project Behind Schedule!

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			

Scenario 2 – Reduce Functionality



Project Behind Schedule!



Scenario 3 – Extend deliverable date



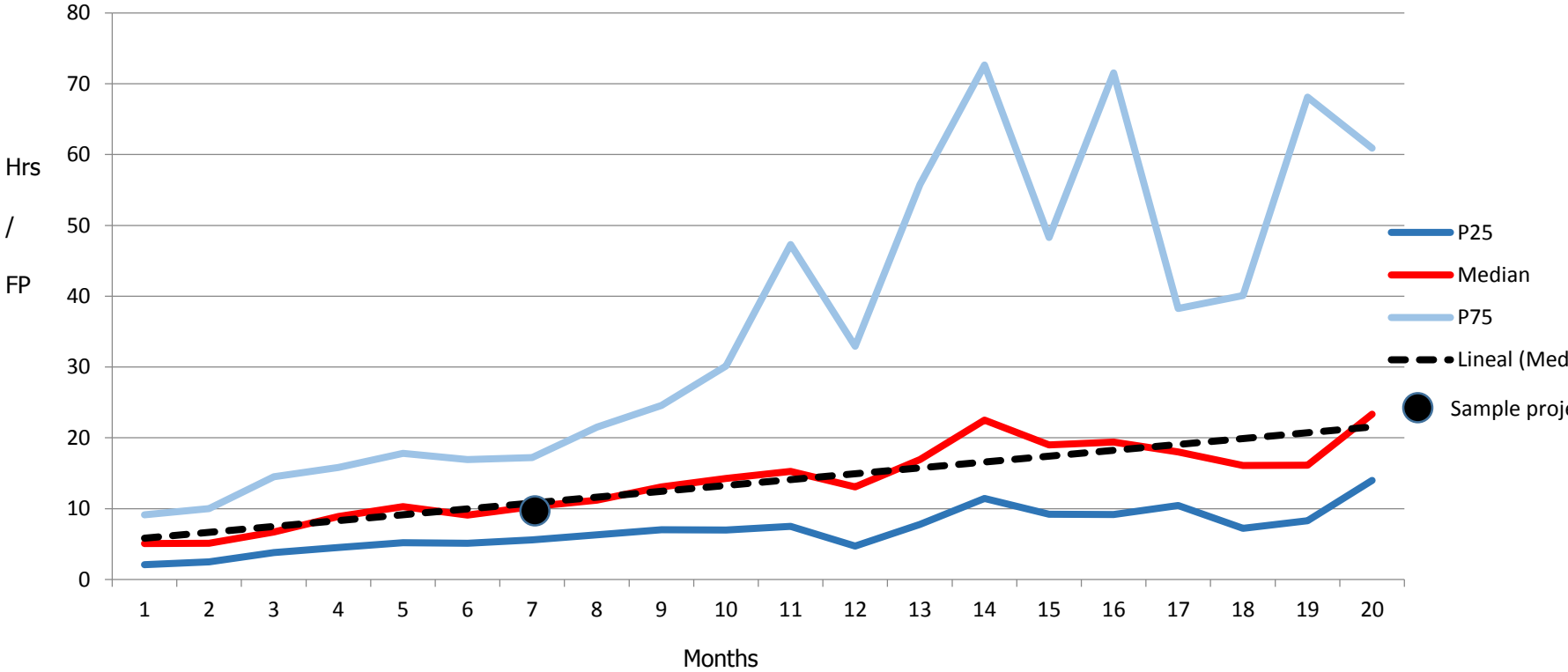
Constraints

- Customer may not accept extension.
- Resources may not be available for an extension.

Project Behind Schedule!

Scenario 3 – Extend deliverable date

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			



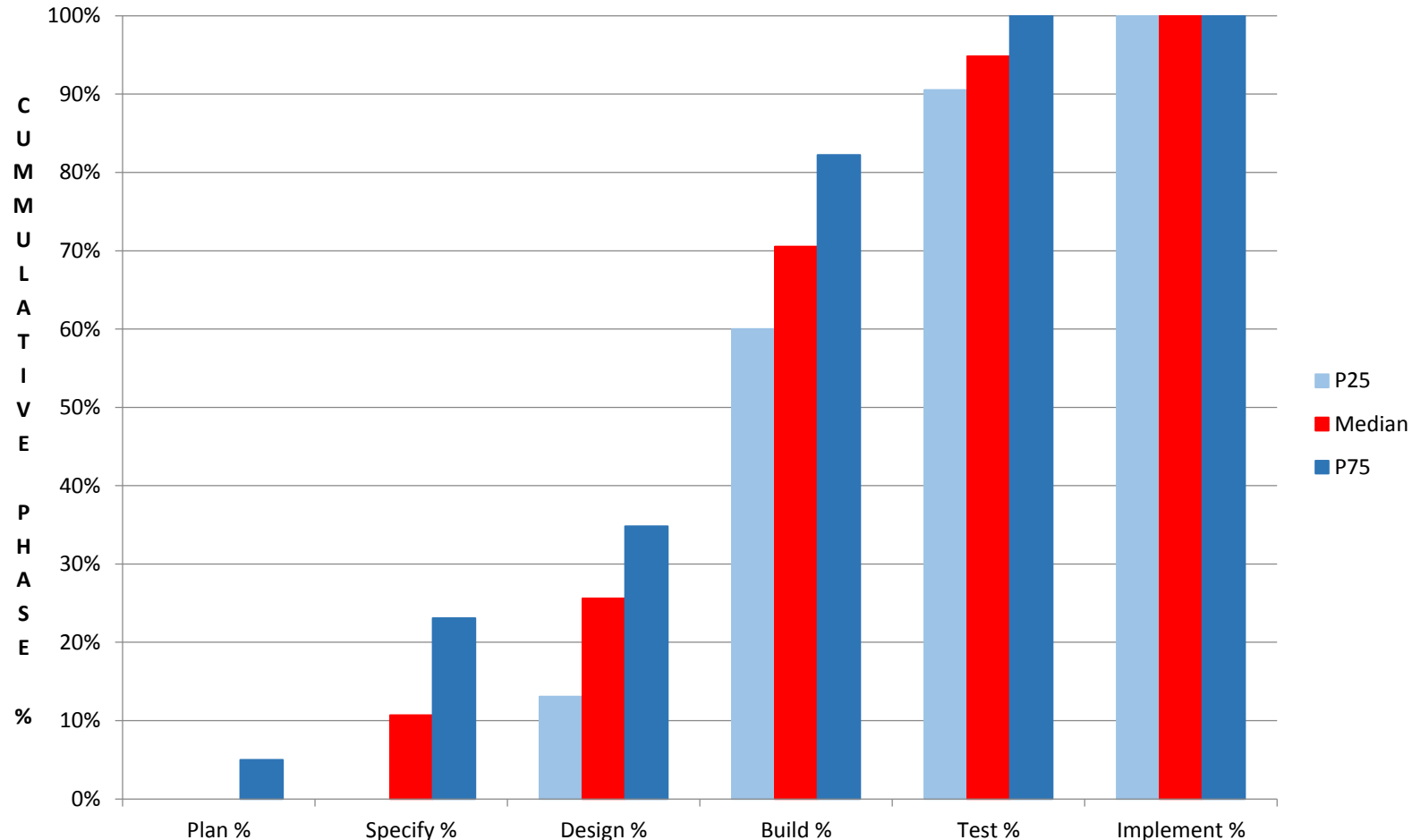
Project Behind Schedule!

Project Phase

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



Project Behind Schedule!

Changes to Project

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

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

Design

$$\downarrow \text{FP} * \text{New Hours/FP} * \$/\text{hour} * \% \text{effort post design} \\ = 700 * 14.2 * 100 * 74\% = \$735,560$$

Delivery

$$\text{Calculate total cost} = \underline{\underline{\$906,640}}$$

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 = $9.4 * 1.51 = 14.2$

Project Behind Schedule!

Scenario 2 – Reduce 200 FP

Start

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

Design

$$\downarrow \text{FP} * \text{New Hours/FP} * \$/\text{hour} * \% \text{effort post design} \\ = 500 * 8.4 * 100 * 74\% = \$310,800$$

Delivery

$$\downarrow = 200 * \text{Estimated Hours/FP} * \$/\text{hour} \\ = 200 * 10 * 100 = \$200,000$$

Next project

$$\text{Calculate total cost} = \underline{\underline{\$681,880}}$$

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 = $9.4 * 0.89 = 8.4$

Project Behind Schedule!

Scenario 3 – Extend 2 months

Start

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

Design

$$\downarrow \text{FP} * \text{New Hours/FP} * \$/\text{hour} * \% \text{effort post design} \\ = 700 * 11.0 * 100 * 74\% = \$569,800$$

Delivery

$$\text{Calculate total cost} = \underline{\underline{\$740,800}}$$

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

Project Behind Schedule!

Comparison

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.

Project Behind Schedule!

Wrap-up

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”



ECORFAN®

© ECORFAN-Mexico, S.C.

No part of this document covered by the Federal Copyright Law may be reproduced, transmitted or used in any form or medium, whether graphic, electronic or mechanical, including but not limited to the following: Citations in articles and comments Bibliographical, compilation of radio or electronic journalistic data. For the effects of articles 13, 162,163 fraction I, 164 fraction I, 168, 169,209 fraction III and other relative of the Federal Law of Copyright. Violations: Be forced to prosecute under Mexican copyright law. The use of general descriptive names, registered names, trademarks, in this publication do not imply, uniformly in the absence of a specific statement, that such names are exempt from the relevant protector in laws and regulations of Mexico and therefore free for General use of the international scientific community. BCNMES is part of the media of ECORFAN-Mexico, S.C., E: 94-443.F: 008- (www.ecorfan.org/ booklets)