

Today we're going to talk about Forecasting



How would
you define a
Project Forecast?



Producing an accurate, reliable and repeatable forecast cost-to-complete is a critical function of project controls.



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Further, you need to produce a
month-over-month time-phased
cash flow forecast



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About the Speaker

Chris Ronak – CEO, 4castplus Project Cost Management

- Background in Technology
- Worked in Large and Mega IT projects globally
- Worked with Project Controls systems for 12 years
- Founder of 4castplus Project Cost Management Solutions
 - ✓ Advanced Project Controls
 - ✓ Construction project procurement & subcontracting
 - ✓ Construction cost tracking
 - ✓ Budgeting & Forecasting



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It Starts with Good Planning



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A Shift to Better Planning Streamlines Execution

Upfront planning reduces effort during execution by enabling:

- Automation
- Preconfigured Values and Codes
- Data Validation at Point of Entry
- Elimination of Rework
- Well-Defined Team Roles: Less Uncertainty



Planning for Measurement and Forecasting

Key Planning Elements for a Project that can be Forecasted:

- A Well-Designed WBS and CBS
- A Time-Phased Budget
- A Budget Built-up from the Resource Level
- Automated and Distributed Progress Measurements



Work Breakdown Structure

Folder Workpackage Deliverables Views Actions Copy Paste Import/Export Lock WBS Help											
WBS	Name	Qty	Unit	Cost Code	Active	Display on Timesheet	Start Date	Finish Date	Control Level	AFE/PO	
3.1	Phase 1 - Structures			31	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2017-Dec-11	2018-Dec-01	2	AFE22011	
3.1.1	Main Facility Construction	8174	Square Feet	502	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2018-Jun-24	2018-Sep-23	3	AFE22011	Main contractor
3.1.2	Cleaning, Grubbing and Site Prep	30000	Square Feet	503	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2017-Dec-11	2018-Jan-22	3	AFE22011	
3.1.3	Onsite Engineer	4	Milestones	504	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2018-Jun-24	2018-Sep-23	3	AFE22011	
3.1.4	Pipeline Culvert Construction	2310	in	505	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2018-Jan-08	2018-Apr-30	3	AFE22011	
3.1.5	Control Systems Hardware	300	Each	506	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2018-Jul-20	2018-Dec-01	3	AFE22011	
3.1.6	Install Small Bore Pipe and Supports	627	Each	508	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2018-Apr-24	2018-Jul-23	3	AFE22011	
3.2	Phase 2 - Elevation			E1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2018-Feb-12	2018-Dec-01	2	AFE22011	
3.2.1	Install Small Bore Pipe and Supports	381	Each	508	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2018-Apr-24	2018-Jul-23	3	AFE22011	
3.2.6	Pipeline Culvert Construction	1267	in	505	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2018-Jun-24	2018-Sep-23	3	AFE22011	
3.2.7	Control Systems Hardware	115	Each	506	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2018-Jul-20	2018-Dec-01	3	AFE22011	
3.2.8	MCC Installation	30	Each	515	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2018-Feb-12	2018-Apr-30	3	AFE22011	
3.2.9	Tie-in Stud Welds	164	Welds	291	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2018-Apr-24	2018-May-15	3	AFE22011	
3.3	Phase 3: Environmental Management			M16	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2018-May-24	2018-Dec-23	2	AFE22011	
3.3.1	Geo-Liner Construction	2309	m3	601	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2018-Aug-24	2018-Oct-23	3	AFE22011	
3.3.2	Geotechnical	6	Milestones	602	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2018-Aug-24	2018-Oct-23	3	AFE22011	
3.3.3	Injection Pumps - Building Construction and Install	85	m3	606	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2018-Jun-23	2018-Oct-07	3	AFE22011	Container buildin

A Bottom-up Estimate / Budget

Workpackage Name	Pipeline Culvert Construction	Current Unit Qty	2310	Unit Cost	\$17.14	Cost	\$39,585	Percent	26.88 %
Description		Unit Type	in	Contractor	\$0.00		\$0		0.00 %
Start Date	2018-Aug-31	Unit Cost	\$65.72	Equipment	\$5.74		\$13,250		8.73 %
End Date	2018-Dec-21	Total Cost	\$151,605	Material	\$17.79		\$41,000		27.07 %
Cost Code	505			Expense	\$0.00		\$0		0.00 %
Billing Type	Cost			Service	\$34.96		\$80,800		53.21 %
Default Cost Code	Default Cost Code			Unspecified	\$0.00		(\$22,820)		-15.18 %
				Total	\$65.72		\$151,605		100.00 %

Drag a column header and drop it here to group by that column

#	Resource Type	Resource	Resource Class	Cost Code	Rate Type	Qty	Cost Rate	Cost	Hours
<input type="checkbox"/>	Service	Excavate 18" Manhole	18" Trenching	C1248QN78-51-505	Lump Sum	1	\$37,600.00	\$37,600.00	
<input type="checkbox"/>	Service	Excavate and Trench Pipeline Culvert	Excavation	C1248QN78-51-505	Lump Sum	1	\$43,200.00	\$43,200.00	
<input type="checkbox"/>	Material	3-0 Gravel	Earth Structure Materials	C1248QN78-51-505	Cubic Yard	30	\$120.00	\$3,600.00	
<input type="checkbox"/>	Material	Geosynthetic Trench Lining Material	Earth Structure Materials	C1248QN78-51-505	Square Foot	3218	\$11.85	\$37,489.70	
<input type="checkbox"/>	Labor		Certified Journeyman	C1248QN78-51-505	HR	80	\$74.81	\$5,984.80	
<input type="checkbox"/>	Labor		Engineering - Civil I	C1248QN78-51-505	HR	200	\$129.00	\$25,800.00	
<input type="checkbox"/>	Labor		Field and Pipeline Inspection	C1248QN78-51-505	HR	20	\$72.00	\$1,440.00	
<input type="checkbox"/>	Labor		Field Worker Labor	C1248QN78-51-505	HR	120	\$38.00	\$4,560.00	
<input type="checkbox"/>	Labor		Heavy Equipment Operator	C1248QN78-51-505	HR	40	\$45.00	\$1,800.00	
<input type="checkbox"/>	Equipment		Hybrid Excavator	C1248QN78-51-505	Daily	5	\$1,300.00	\$6,500.00	
<input type="checkbox"/>	Equipment		Rock Truck - 25 Ton	C1248QN78-51-505	Daily	5	\$1,390.00	\$6,950.00	
								\$174,724.80	

Automated and Distributed Progress Measurements

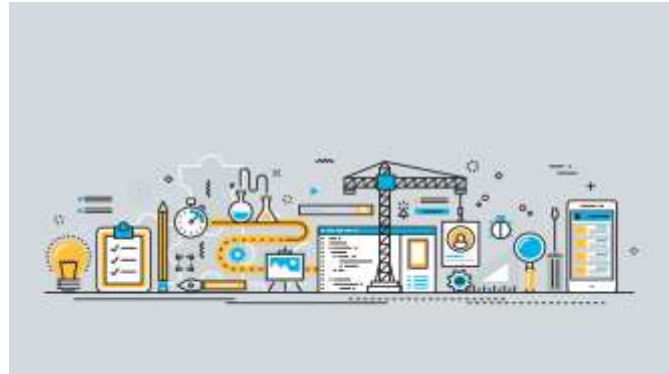
BS	Workpackage	Progress Method	Current Qty	Unit	Actual Qty	Current Budget	% Complete	Actual Cost	Planned Value	CP (Cost)	Earned Value	SP (Cost)
-3	Facility Construction					\$3,716,822	22.74 %	\$953,506	\$880,174	0.89	\$845,194	0.96
3.1	Phase 1 - Structures					\$2,204,697	17.58 %	\$398,305	\$344,297	0.87	\$387,071	1.12
3.1.1	Main Facility Construction	Percent Budget Spent	8174	Square Feet	200.00	\$1,516,835	0.81 %	\$12,252	\$151,694	1.00	\$12,252	0.81
3.1.2	Clearing, Grubbing and Site Prep	Percent Units Completed	30900	Square Feet	1,670.00	\$88,368	18.93 %	\$39,623	\$68,350	0.34	\$12,568	0.15
3.1.3	Onsite Engineer	Percent Budget Spent	4	Milestones		\$121,203	88.81 %	\$105,213	\$25,972	1.00	\$105,213	4.82
3.1.4	Pipeline Culvert Construction	Percent Units Completed	2310	In	1,350.00	\$197,339	58.44 %	\$149,022	\$27,884	0.77	\$115,305	4.14
3.1.5	Control Systems Hardware	Value of Work Done - Percent	320	Each	50.00	\$207,831	52.48 %	\$79,756		1.31	\$104,815	
3.1.6	Install Small Bore Pipe and Suppl	Rules of Credit	527	Each		\$92,259	40 %	\$16,439	\$72,488	2.24	\$38,984	0.51
3.2	Phase 2 - Elevation					\$876,847	42.58 %	\$426,595	\$515,272	0.87	\$373,333	0.72
3.2.1	Install Small Bore Pipe and Suppl	Rules of Credit	381	Each	171.87	\$164,093	45.11 %	\$44,235	\$78,609	3.62	\$109,954	0.52
3.2.2	Pipeline Culvert Construction	Percent Units Completed	1337	In	1,618.00	\$283,344	58.79 %	\$276,774	\$95,431	0.56	\$207,463	2.46
3.2.3	Control Systems Hardware	Value of Work Done - Percent	119	Each		\$52,877				1.00		
3.2.8	MCC Installation and Tie-in	Percent Budget Spent	30	Each		\$176,233	3.35 %	\$5,895	\$176,233	1.00	\$5,895	0.02
3.3	Phase 3: Environmental Manu					\$429,988	20.14 %	\$127,547	\$24,505	0.67	\$84,781	3.46
						\$5,831,762.72	40.57 %	\$2,574,292.94	\$2,916,404.38	0.92	\$2,396,055.45	0.81

Quantity-Based Progressing Example

Current Budgeted Quantity = 1287.00 linear meters (lm)
Actual Quantity to date = 1014.00 linear meters
Percent Complete = 78.79%



Establish a well-defined process



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Establish a Well-Defined Process

- The Importance of The Project Team
- Iterative Reporting Periods
- Continuous Information Capture
- Apply Standards and Consistency



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Iterative, Incremental Reporting Periods



Establish a Well-Defined Process

- The Importance of The Project Team
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Project Execution Phase



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Project Execution Phase

For each period during execution:

- Tracking
- Measuring
- Analyzing
- Forecasting
- Reporting



Project Tracking: Compare Budget versus Actual

To PDF To Excel

Earned Value S-Curve Report - Cost As Of 15-Jun-2018



Analysis and Forecasting



Forecasting Methods

- Summary Forecasting
- Detail Forecasting
- Forecasting by Productivity Factor
- Forecasting the Rates
- Time-Phasing the Forecast



Summary-Level Forecasting

Calculate Edit Delete Submit Actions Reports Comments Show Estimating Tools												
WBS	Workpackage	Current Budget	% Complete	Actual Cost	Planned Value	CR (Cost)	CR (Forecast)	Estimate To Complete (ETC)	Estimate To Complete (Forecasted)	Estimate At Complete (EAC)	Estimate At Complete (Forecasted)	Earned Value
3	Facility Construction	\$3,716,822	22.74 %	\$953,506	\$880,174	0.89	0.89	\$3,555,948	\$2,592,508	\$4,509,504	\$4,546,964	\$94
3.1	Phase 1 - Structures	\$2,281,897	17.58 %	\$399,305	\$344,397	0.97	0.96	\$1,886,394	\$1,886,394	\$2,285,899	\$2,285,699	\$36
3.1.1	Main Facility Construction	\$1,516,935	0.01 %	\$12,252	\$151,694	1.00	1.00	\$1,504,685	\$1,504,685	\$1,516,937	\$1,516,937	\$1
3.1.2	Clearing, Grubbing and Site Prep	\$86,368	18.33 %	\$36,623	\$86,368	0.34	0.34	\$156,876	\$156,876	\$193,499	\$193,499	\$1
3.1.3	Grate Engineer	\$121,203	86.81 %	\$185,213	\$25,972	1.00	1.00	\$15,990	\$15,990	\$121,203	\$121,203	\$10
3.1.4	Pipeline Culvert Construction	\$187,309	58.44 %	\$149,822	\$27,084	0.77	0.77	\$105,971	\$205,971	\$254,993	\$254,993	\$11
3.1.5	Control Systems Hardware	\$207,601	50.49 %	\$79,798		1.31	1.31	\$78,213	\$78,213	\$157,969	\$157,969	\$10
3.1.6	Install Small Bore Pipe and Supp	\$82,258	40 %	\$16,439	\$72,488	2.24	2.24	\$24,659	\$24,659	\$41,090	\$41,090	\$3
3.2	Phase 2 - Elevation	\$876,847	42.58 %	\$426,906	\$515,272	0.87	1.13	\$406,282	\$444,842	\$636,167	\$671,747	\$37
3.2.1	Install Small Bore Pipe and Supp	\$354,593	49.11 %	\$44,236	\$278,889	1.62	1.50	\$81,820	\$129,759	\$38,964	\$172,885	\$10
3.2.6	Pipeline Culvert Construction	\$203,344	76.79 %	\$176,774	\$36,431	0.55	0.90	\$101,438	\$62,068	\$478,213	\$438,942	\$20
3.2.7	Control Systems Hardware	\$82,677				1.00	1.00	\$82,677	\$82,677	\$82,677	\$82,677	\$1
3.2.8	MCC Installation and Tie-in	\$176,233	3.35 %	\$5,895	\$176,233	1.00	1.00	\$176,330	\$170,338	\$176,233	\$176,233	\$1
3.3	Phase 3: Environmental Man	\$420,996	20.14 %	\$127,347	\$24,696	0.67	0.32	\$1,043,979	\$1,043,979	\$1,171,326	\$1,171,326	\$8
		\$5,831,702.72	40.57 %	\$2,574,292.94	\$2,916,404.26	0.82	0.83	\$4,149,957.60	\$4,188,517.08	\$6,724,250.54	\$6,760,810.02	\$2,366.8


Time-Phasing the Forecast

Time Phasing

Start Date: 2018-Apr-20
 End Date: 2019-Feb-28
 Mode: Quantity

Comments: Time-phasing the FTC quantity to reflect anticipated piping materials install over the remaining duration

Period	Override?	FTC %	FTC Amount	FTC Quantity	FAC Amount	FAC Quantity	Actual Amount	Actual Quantity	Current Amount	Current Quantity	Comments
Apr 2018	<input type="checkbox"/>				\$4,895.90	15.00	\$4,895.90	15.00	\$1,920.00	6.00	
May 2018	<input type="checkbox"/>				\$2,540.00	27.00	\$2,540.00	27.00	\$1,820.00	6.00	
Jun 2018	<input checked="" type="checkbox"/>	22.52%	\$4,387.44	<input type="text" value="20.00"/>	\$4,387.44	30.00			\$1,920.00	6.00	<input type="text" value="Total installation"/>
Jul 2018	<input checked="" type="checkbox"/>			<input type="text"/>					\$1,920.00	6.00	<input type="text"/>
Aug 2018	<input checked="" type="checkbox"/>	11.76%	\$3,198.72	<input type="text" value="10.00"/>	\$3,198.72	16.00			\$1,820.00	6.00	<input type="text"/>
Sep 2018	<input checked="" type="checkbox"/>			<input type="text"/>					\$1,820.00	6.00	<input type="text"/>
Oct 2018	<input checked="" type="checkbox"/>	35.25%	\$3,598.00	<input type="text" value="20.00"/>	\$3,598.00	20.00			\$1,820.00	6.00	<input type="text" value="Significant increase in activity"/>
Nov 2018	<input checked="" type="checkbox"/>	29.42%	\$4,024.96	<input type="text" value="25.00"/>	\$4,024.96	25.00			\$1,920.00	6.00	<input type="text"/>
Count: 9		100.00%	\$27,290.00	85.00	\$46,640.90	127.00	\$13,440.00	42.00	\$15,360.00	48.00	


Time-phase the FTC Quantity

ETC versus FTC

- **ETC** (EVM) is calculated based on past performance
- **FTC** is *Predictive*, Based on “What’s Remaining”
- **ETC** is theoretical while **FTC** is empirical



Budget vs. ETC vs. FTC Cash Flow





Questions



To Learn More or Contact Us:

- Visit our Website at: www.4castplus.com
- Sign-up for a Free Demo at: www.4castplus.com/freedemo
- Contact us by email at: info@4castplus.com



Detail-Level Forecasting

Add Resources Revise Rates Timespace Remarks To Excel

Drag a column header and drop it here to group by that column

Resource	Rate Type	Current Quantity	Actual Quantity	Remaining Quantity	FTC Quantity	FAC Quantity	Forecast To Complete Cost Rate	Forecast To Complete (FTC) - Cost	Forecast At Complete (FAC) - Cost	Actual Cost	Forecast VAC Quantity
Excavate 16" Mainline	Lump Sum	1.00		1.00	1.00	1.00	\$225,688.00	\$225,688.00	\$225,688.00		
Excavate and Trench Pipeline Culvert	Lump Sum	1.00		1.00	1.00	1.00	\$121,477.00	\$121,477.00	\$121,477.00		
10cm Pipeline - Galvanized-steel coated	em	60.00	42.00	18.00	85.00	127.00	\$320.00	\$27,200.00	\$40,640.00	\$18,440.00	67.00
Anchor Trench	Lump Sum		2.00			2.00	\$54,878.00		\$11,650.00	\$11,650.00	
Benfa Mass.	Hourly		24.00			24.00					
Metall Support	Hourly		24.00			24.00					

Budgeted Qty is 60

Qty-to-date is 42

Remaining is 18

FTC is 85

Variance is 67