

Automation in Project Management

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What is EPPM association ?

- The Association is an academic organization dedicated to encouraging the exchange of ideas, research, and other professional activities that are of a interdisciplinary nature relating to the engineering, project, and production management, while being dedicated to freedom of discussion and research, and undertakes to avoid a prejudiced attitude with respect to any individual, group, political philosophy, or research method.
- Vision next two years:
 - Encouraging the exchange of ideas, research, and other professional activities.
 - Enhance the activities by increasing the organization of workshops.
 - Organize annual workshops and seminars to integrate deferent disciplines of the project management professional

What GUC can do ?

- Encouraging the research of ideas, research, and other professional activities.
- Hosts the activities of workshops and conferences
- A great group of researchers and postgraduate students who can share in developing any future researches.
- Mega laboratories that can be used through any needed research project.

Introduction





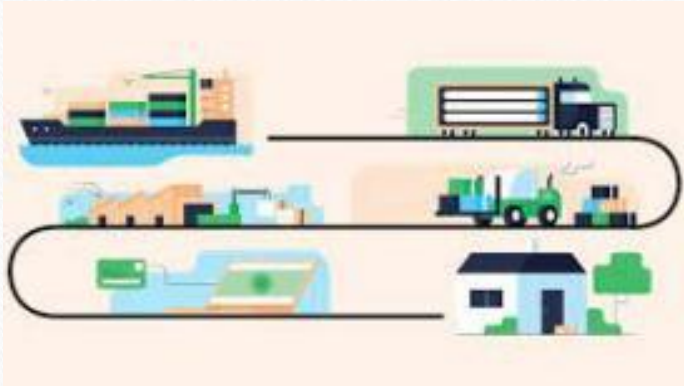


Lotus 123 spreadsheet showing a financial summary for 1981. The data is as follows:

	Q1	Q2	Q3	Q4	YTD
Net Sales	\$10,000.00	\$13,000.00	\$16,000.00	\$20,000.00	\$59,000.00
Costs and Expenses:					
Salary	1,500.00	1,500.00	1,500.00	1,500.00	6,000.00
Int	1,000.00	1,200.00	1,400.00	1,400.00	5,000.00
Rent	200.00	200.00	200.00	200.00	800.00
Adv	500.00	1,000.00	2,000.00	3,000.00	6,500.00
COG	2,000.00	4,000.00	5,000.00	7,000.00	18,000.00
Tp Exp	4,200.00	7,900.00	10,700.00	13,700.00	36,500.00
Qr Income	\$5,800.00	\$5,100.00	\$5,300.00	\$6,300.00	\$20,500.00

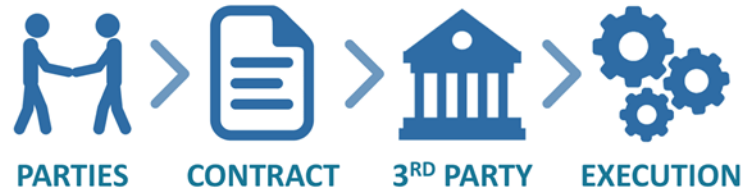


	A	AD	AE	AL	AM	AO	AU	AV	AZ	BA	BB
1		10	20	25	20	25	25	25	25	25	100
2	STUDENT NAME	QUIZ %	PROJ %	QUIZ %	PROJ %	QUIZ %	PROJ %	QUIZ %	PROJ %	Final %	TOTAL POINTS
3											
4	StudentA	+ 0.88	#DIV/0!	+ 0.77	+ 0.77	+ 0.77	+ 0.77	+ 0.77	+ 0.77	#DIV/0!	76.328
5	StudentB	+ 1.00	+ 0.90	*	+ 0.97	+ 0.97	+ 0.97	+ 0.97	+ 0.97	+ 0.97	83.787
6	StudentC	+ 0.94	+ 0.93	*	+ 0.74	+ 0.74	+ 0.74	+ 0.74	+ 0.74	+ 0.74	71.891
51	StudentVV	+ 0.85	+ 0.88	*	+ 0.68	+ 0.68	+ 0.68	+ 0.68	+ 0.68	+ 0.68	81.273
52	StudentWW	+ 0.96	+ 0.99	*	+ 0.88	+ 0.88	+ 0.88	+ 0.88	+ 0.88	+ 0.88	253.413
53	StudentXX	+ 0.88	+ 0.80	*	+ 0.64	+ 0.64	+ 0.64	+ 0.64	+ 0.64	+ 0.64	
54											
55	Total									#DIV/0!	
56										Lo: #DIV/0!	
57											
58	Points Possible	1.00	1.00		1.00	1.00	1.00	1.00	1.00		100.000





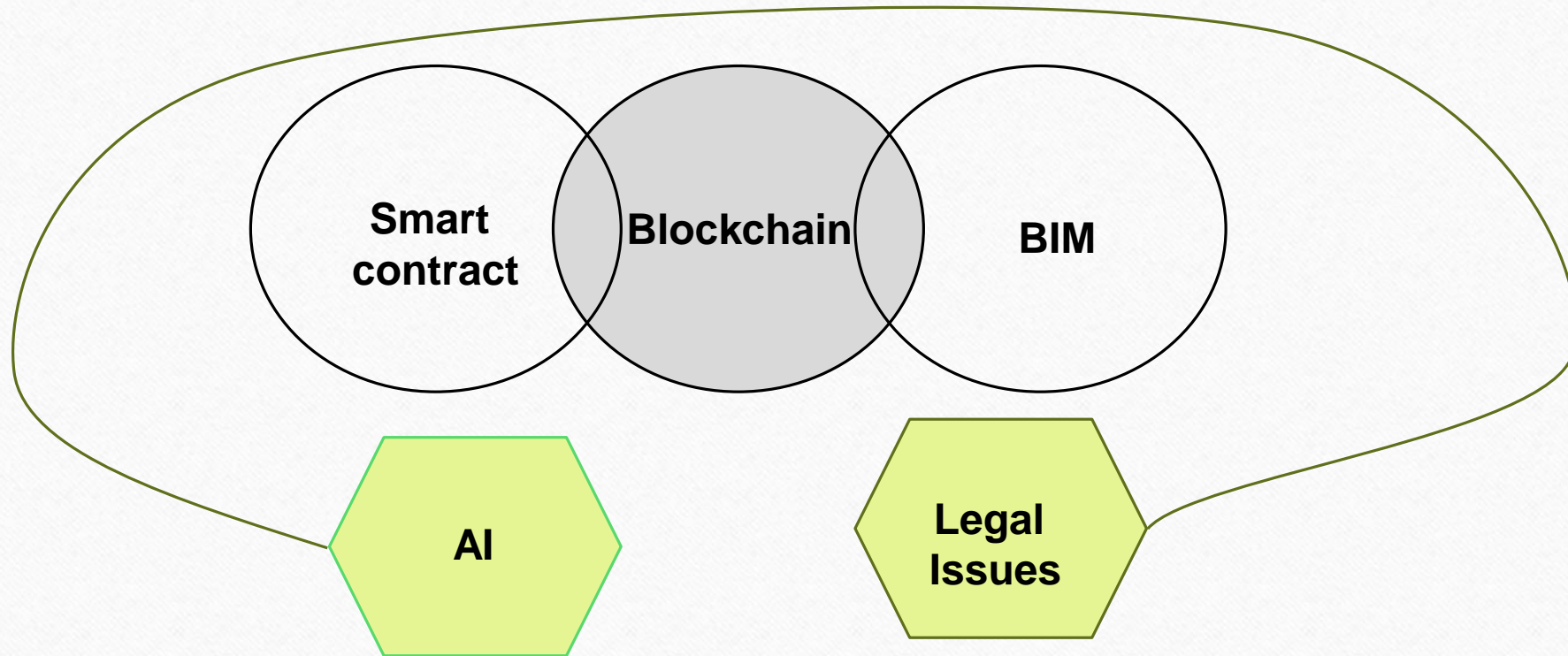
TRADITIONAL CONTRACT



Smart Contract



In Construction We Try



Real Case Studies

Case 1: Best value Contractor/supplier

Best Seller got best score of : Quality (Technical) and Cost

Score = Quality (technical) (Score) + Cost (Score) in percentage (%)

Or

The Proposal = Proposal (\$) – Quality (\$).....in \$

Converting the technical score into price

So, we determine the Technical Equivalent Price (TEP)

The criteria that the tender evaluators or the bid specialized used to evaluate the technical proposal were divided into six groups, each group contains its sub-criterion as follows:

- 1- Financial soundness: liquidity, fixed and current assets, banking arrangement and credit rating..etc.
- 2- Management capability: current workload and ability to handle current projects..etc.
- 3- Experience: level of technology...etc.
- 4- Resources: availability of owned resources.
- 5- Health & safety
- 6- Reputation: past failure to perform a contract, past relationship between the contractor/supplier and the owner, Time taken to accomplish a work compared to the contract duration...etc.

- If the proposal's price is lower than approved price range, it will be disqualified to avoid the unreliable contracts.
- If it's higher, the proposal will be qualified as his TEP might be high enough to decrease his final bid price

- **Technical equivalent price (TEP):** is a price which is determined by converting the proposals' technical score, and can only be determined if the contractor is technically approved.
- **Accepted Lowest Bid Price:** The lowest price which is not higher or lower than the project estimated cost by 8%.
- **Min Technical Score:** The minimum technical required score that the responsible for awarding the contract has to assign for the project based on the project scale and requirements.
- **Proposal's Score:** The technical score that the decision support-model generates for the proposal.

1. Financial soundness

1. Fixed & current assets

Fixed and current assets	Rating From (1-10)	Geometric Mean	Priority Vector
Liquidity.		0.624	0.458
Credit rating.		1.006	0.161
Banking arrangement and bonding.		2.335	0.075
Balance Sheet		1.440	0.117

2. Management capability

3. Experience

4. Resources

5. Health & safety

6. Reputation

Importance weight of main technical criteria according to the project scale

Project Scale	Financial Soundness	Management Capability	Experience	Resources	Health & Safety	Reputation
≤ 5M	47.0%	14.0%	14.7%	14.5%	4.8%	5.1%
> 5M & ≤ 100M	38.5%	13.6%	16.1%	17.8%	6.6%	7.6%
> 100M & ≤ 250M	34.0%	15.3%	15.5%	19.9%	7.5%	8.0%
> 250M & ≤ 500M	29.8%	15.0%	14.8%	21.8%	9.0%	9.6%
> 500M	22.0%	16.9%	16.0%	24.7%	10.3%	10.0%

Change the linguistic variables into numbers Saaty scale (1980)

General Definition	Penalties Definition	Problems Definition	Intensity
Very Poor	Not Accepted Penalties	Not Accepted problem	1
Poor	Severe Penalties	Sever Problem	2
Moderately Poor	Very high Penalties	Major problem	3
Fair	High Penalties	Moderately major problem	4
Moderately Good	Moderately high	Fair	5
Good	Fair	Moderately minor problem	6
Very Good	Moderately low Penalties	Minor Problem	7
Excellent	Low Penalties	Not at all a problem	8
Outstanding	Very low Penalties	No Recorded Event	9

Bidders Evaluation (Technical and Financial)

- Project Information

Company Name:

Project Scale: < 5M

Project Estimated Cost (LE) = 400

Min Required Technical Score = 0.1798

- Technically Disqualified Bidders

#	Bidder Name	Technical Score
1	Bidder1	0.157

- Qualified Bidders *

#	Bidder Name	Technical Score	Bid Price	Technical Equivalent Price (TEP)	Total Bid Price
1	Bidder2	0.2242	LE416.00M	LE16.358M	LE399.642M
2	Bidder3	0.1947	LE411.00M	LE6.225M	LE404.775M
3	Bidder4	0.2443	LE425.00M	LE21.874M	LE403.126M

It's recommended to choose Bidder: **Bidder2**

Bidders Evaluation (Technical and Financial)

- Project Information

Company Name:

Project Scale: > 250M & < 500M

Project Estimated Cost (LE) = LE400.00M

Min Required Technical Score = 0.1798

- Technically Disqualified Bidders

#	Bidder Name	Technical Score
1	Hassan Allam	0.1673

- Technically and Financially Qualified Bidders *

#	Bidder Name	Technical Score	Bid Price	Technical Equivalent Price (TEP)	Final Bid Price
1	Orascom	0.2215	LE416.00M	LE9.672M	LE406.328M
2	Tatweer Masr	0.1952	LE411.00M	LE3.577M	LE407.423M
3	Redcon	0.2362	LE425.00M	LE12.988M	LE412.012M

It's recommended to award the contract to: **Orascom**

Case 2: Control Cost Overrun (AI) and (EVM) Analysis

Data Collection



Data was collected through previous research, interviews, case studies, and questionnaires.

A total of 100 projects were successfully gathered.

The most common significant 49 factors were collected and ranked.

The information needed regarding the "EVM" were collected.

49 Significant Cost Overrun Factors

The most common cost overrun problems					
Category	ID	Problem	Count	RII	Source
Factors Related to Financial Conditions	F-1	Financial Situation of the Owner	12	3.8	Journal/Real case
	F-2	Financial Situation of the Contractor	18	9.33	Journal/Real case
	F-3	Delay in Payments	12	5.37	Journal/Real case
	F-4	Currency Fluctuation	4	16.8	Journal/Real case
	F-5	Delay/Lack of advanced payment	3	9.89	Journal/Real case
Factors Related to Resources Conditions	F-6	Materials Shortage	19	8.81	Journal/Real case
	F-7	Fluctuations in material prices	16	12.98	Journal/Real case
	F-8	Accuracy in Material Estimation	5	10.76	Journal/Real case
	F-9	Late Delivery of materials	4	2.68	Journal/Real case
	F-10	Equipment Shortage	6	2.04	Journal/Real case
	F-11	Equipment Breakdowns	6	4.79	Journal/Real case

The most common cost overrun problems

Category	ID	Problem	Count	RII	Source
Factors Related to Financial Conditions	F-1	Financial Situation of the Owner	12	3.8	Journal/Real case
	F-2	Financial Situation of the Contractor	18	9.33	Journal/Real case
	F-3	Delay in Payments	12	5.37	Journal/Real case
	F-4	Currency Fluctuation	4	16.8	Journal/Real case
	F-5	Delay/Lack of advanced payment	3	9.89	Journal/Real case

Factors Related to Project Management and Contract Administration Conditions	F-32	Conflict of Interest Among Stakeholders	3	3.39	Journal/Real case
	F-33	Dispute Settlement Procedure	6	2.68	Journal/Real case
	F-34	Differences in Contract Clause Perception	3	-	Journal
	F-35	Unrealistic Schedule Imposed in the Contract	16	1.52	Journal/Real case
	Factors Related to Contractor Conditions	F-36	Poor Management by the Contractor	13	4.47
F-37		Prequalification of the Contractor	3	9.54	Journal/Real case
F-38		An Inadequate Decision-Making Process	3	-	Journal
F-39		Poor Estimation of Cost	10	10.76	Journal/Real case
F-40		Ignoring Safety Policies (no-compliance/adherence to safety standards)	3	5.41	Journal/Real case
F-41		Delay in Relocation of Existing Utilities	2	7.75	Journal/Real case
F-42		Proficiency of the Surveying Office	2	3.34	Journal/Real case
Factors Related to External Conditions	F-43	Ambiguous Specifications	4	2.2	Journal/Real case
	F-44	Cost Escalation of Resources	12	12.98	Journal/Real case
	F-45	Unforeseen Weather Conditions	31	-	Journal
	F-46	Poor Communication Between Parties	19	3.39	Journal/Real case
	F-47	Political Problems	7	4.53	Journal/Real case
	F-48	Force Majeure	7	1.85	Journal/Real case
	F-49	Difficulty to take permits/approvals	4	3.95	Journal/Real case

Cost overrun analysis

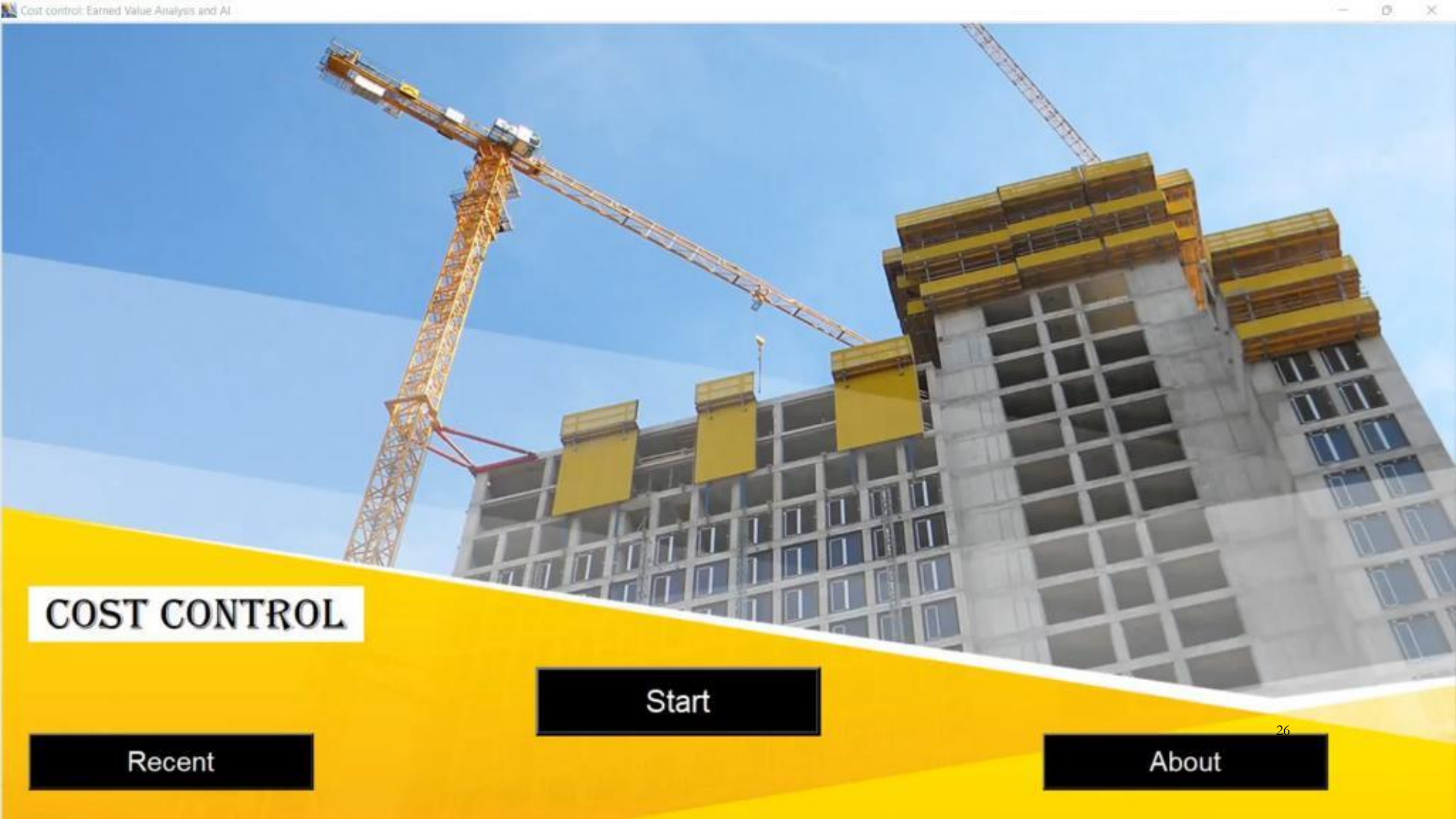
Part 1. Factors Related to Financial Conditions

Factors Related to Financial Conditions

ID	Factor name	Avg. probability	Avg. impact	RII	Group rank
F-1	Financial Situation of the Owner	2.87	3.2	9.20	4
F-2	Financial Situation of the Contractor	3.08	3.23	9.94	3
F-3	Delay in Payments	3.11	3.45	10.72	1
F-4	Currency Fluctuation	2.85	3.71	10.59	2
F-5	Delay/Lack of advanced payment	2.85	2.99	8.53	5

Software Development





COST CONTROL

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Case 3: Developed Software Project Performance Monitoring

Builders Control System (BCS)

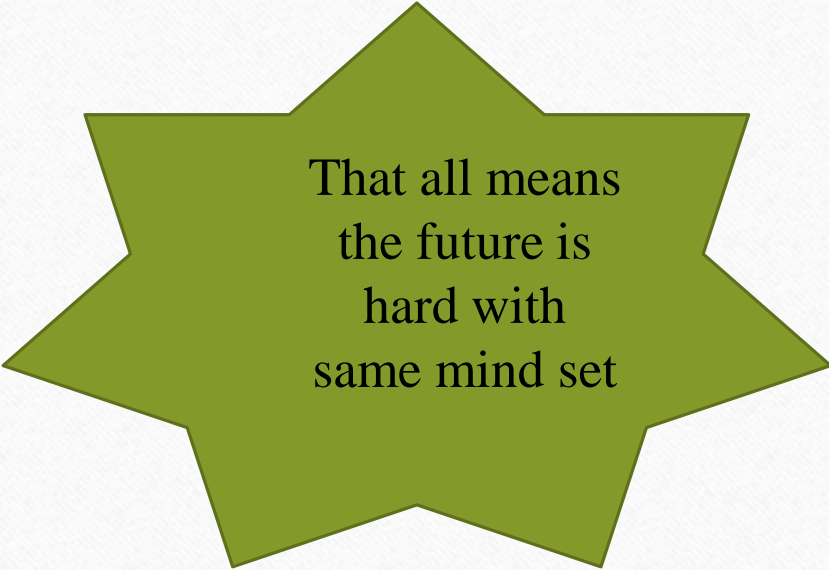
Builders Control System (BCS) offers a project management competency framework for the construction organizations.

- BCS is a construction project management software that provides custom home builders with tools for managing organization, projects, and financials.
- It allows users to sync data from Bill of quantity, change orders, and invoices online.
- Users can manage their projects from their tablet or desktop easily.
- Client and subcontractor management.
- Invoices indication.
- Detailed cost monitoring.
- Quantities tracking, change order monitoring.
- Project detailed financial status.
- Forecasting project estimate at completion for direct and indirect items
- Detailed and summarized reporting systems.
- Project prospecting, estimating, and bidding.
- Customized Reports.
- Project benchmarking.
- Earned value management.


	Builders Control system	Traditional method
Time	<ul style="list-style-type: none"> • Allows faster data entry. • It allows documents such as invoices, purchase orders and payroll to be collated and printed quickly and accurately • Once data is input, you can create reports literally by pressing a button in BCS. 	<ul style="list-style-type: none"> • Manually managing is a very tough and time-consuming process. • Time consuming and costly to produce reports.
Accuracy	Calculations are done automatically, minimizing errors and increasing efficiency.	Excel sheets will give accurate data and reports as long as the data is revised manually.
Project team cost	One professional engineer can manage more than a project	1 professional engineer for small to medium project. 2 professional engineers for a large scale project
Training time	One week is an enough training period that can be given to the engineers to be ready to use the website	3 months is a minimum training period to make the engineer able to deal with excel sheet
Backup	The ease of backup of BCS.	The excel sheets can stop working suddenly, can take longer time to calculate & save in case of large scale projects.

Our vision for the Future in Project management

- All projects (any category/types) will postponed to automations to solve their issues.
- All organizations are going to look over the automation to be in competitive in the market.
- Market will change faster than expectation as fast as automations.
- Traditional jobs will decrease and may disappears
- New jobs and classification will be needed and will be modified very fast.



That all means
the future is
hard with
same mind set



Mind Set must
change and
keep changes
always

