Earned Value Management & Risk Matrices

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CECS 445

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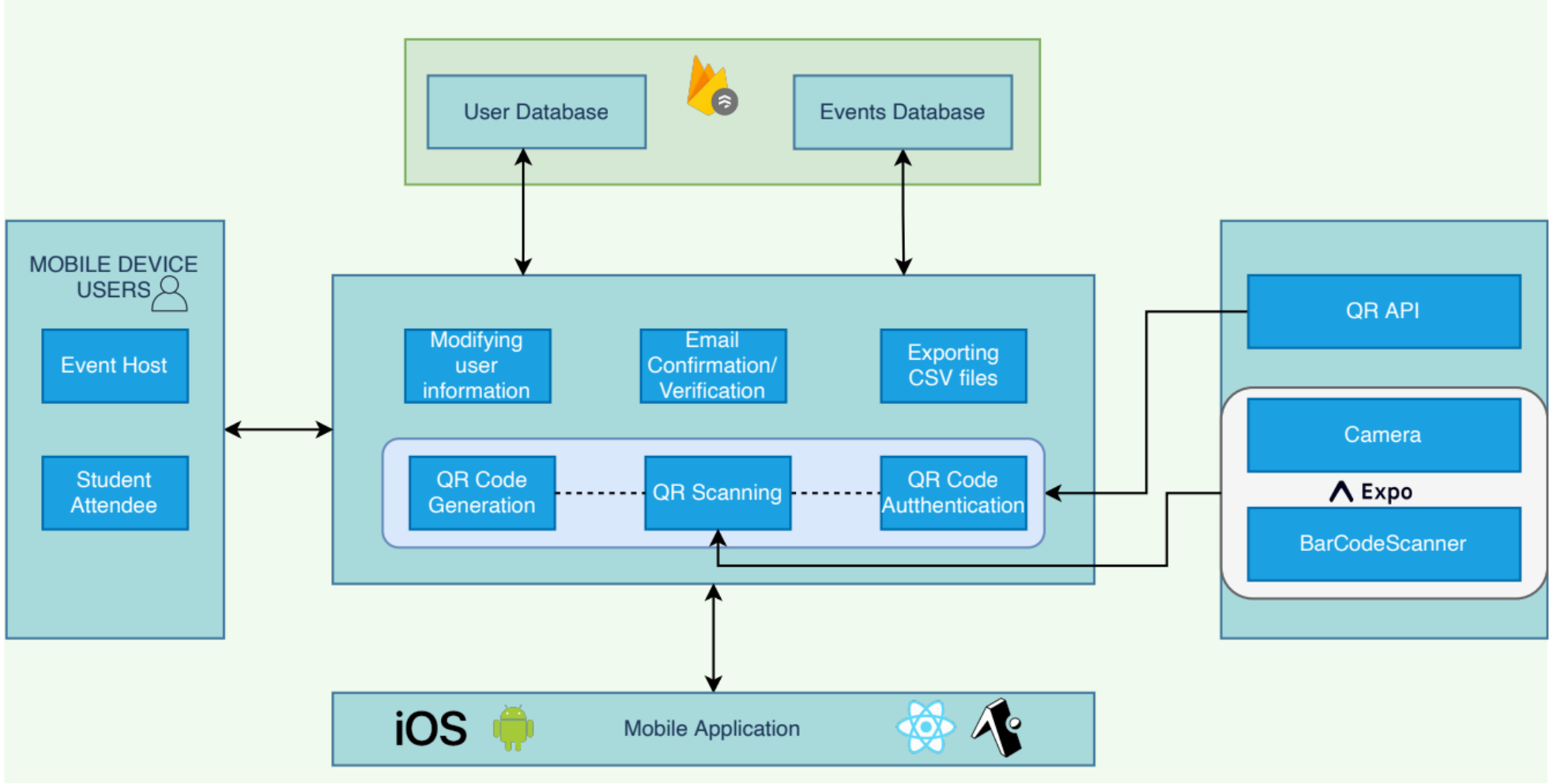
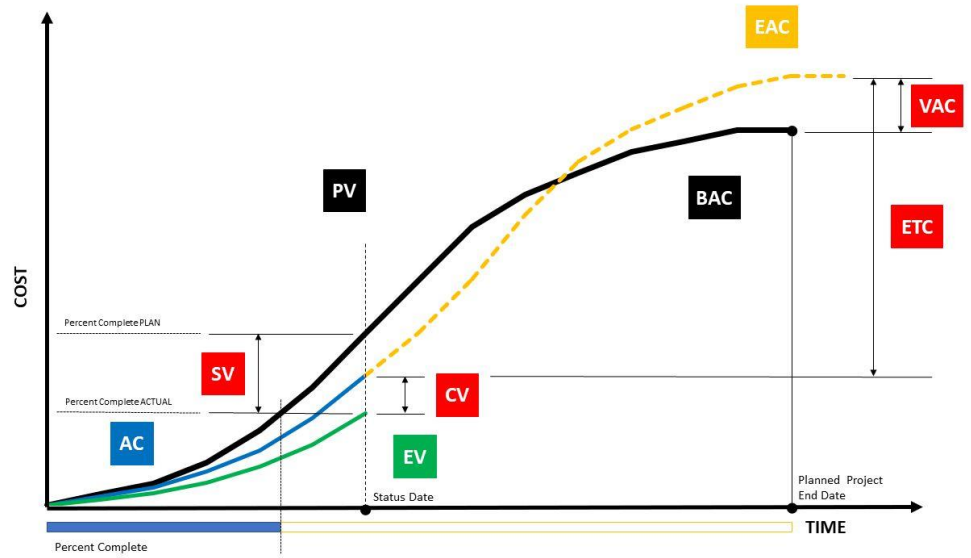
Congratulations! Well Done Team AXIOM!



This Week … Development!

Earned Value Management

- **BAC** = Budget at Completion
- **BCWP** = Budget Cost of Work Performed
- **BCWS** = Budget Cost of Work Scheduled
- **ACWP** = Actual Cost of Work Performed



$$BAC = \Sigma\,(BCWS_k) \text{ for all tasks } k$$

$$\text{Schedule performance index, } SPI = \frac{BCWP}{BCWS}$$

$$\text{Schedule variance, } SV = BCWP - BCWS$$

$$\text{Percent scheduled for completion} = \frac{BCWS}{BAC}$$

$$\text{Percent complete} = \frac{BCWP}{BAC}$$

$$\text{Cost performance index, } CPI = \frac{BCWP}{ACWP}$$

$$\text{Cost variance, } CV = BCWP - ACWP$$

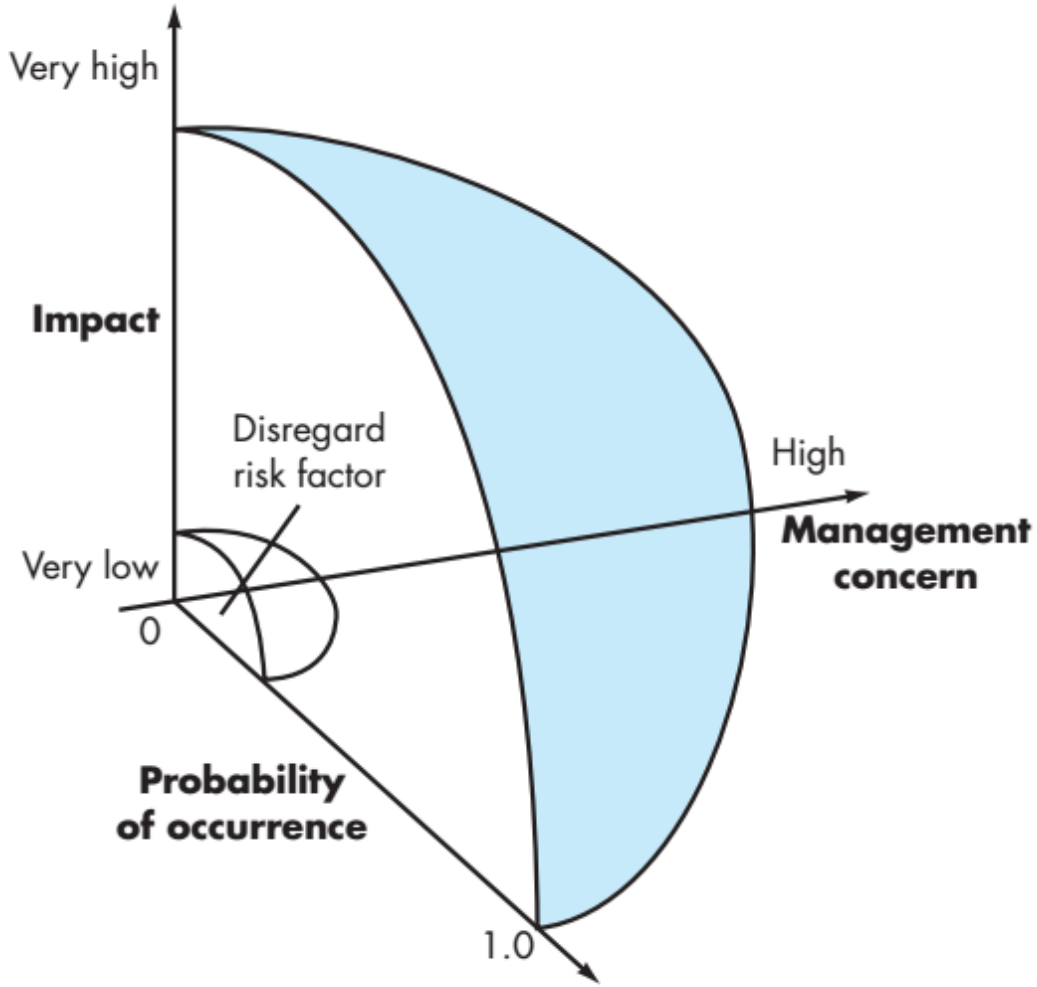
Earned Value Example

- BCWP = Requirement Length * Budgeted Proportion of Time for Lead on Requirement * (Lead Hours Per Month)
- ACWP = Actual Hours Spent on Requirement
- Ex: Budgeted for 0.2 time for 2 weeks at 40 Hours Per Month; Really Spent 22 Hours
- CPI = BCWP / ACWP = ((0.2 * 40 * (2/4)) / 22) = 0.18

Risk Matrix

Components / Category		Performance	Support	Cost	Schedule
Catastrophic	1	Failure to meet the requirement would result in mission failure		Failure results in increased costs and schedule delays with expected values in excess of $500K	
	2	Significant degradation to nonachievement of technical performance	Nonresponsive or unsupportable software	Significant financial shortages, budget overrun likely	Unachievable IOC
Critical	1	Failure to meet the requirement would degrade system performance to a point where mission success is questionable		Failure results in operational delays and/or increased costs with expected value of $100K to $500K	
	2	Some reduction in technical performance	Minor delays in software modifications	Some shortage of financial resources, possible overruns	Possible slippage in IOC
Marginal	1	Failure to meet the requirement would result in degradation of secondary mission		Costs, impacts, and/or recoverable schedule slips with expected value of $1K to $100K	
	2	Minimal to small reduction in technical performance	Responsive software support	Sufficient financial resources	Realistic, achievable schedule
Negligible	1	Failure to meet the requirement would create inconvenience or nonoperational impact		Error results in minor cost and/or schedule impact with expected value of less than $1K	
	2	No reduction in technical performance	Easily supportable software	Possible budget underrun	Early achievable IOC

Risk Equation



$$\mathrm{RE} = P \times C$$

RE = Risk Exposure

P = Probability of Risk

C = Cost of Risk