

Portfolio of Capital Project Assessment Against Annual Cost Deviations

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Abbreviated abstract: This study aims to evaluate portfolios of capital projects, in order to describe the investments behavior against established parameters, evaluate relationships between them and create subsidy to enable future studies/applications of machining learning and artificial intelligence in the projects and portfolio management universe. Descriptive and inferential statistics showed influence of the phase and investment size in the deviation range. The influence of the execution condition had no impact, demystifying a common sense among professionals in the area. The investment phase presented statistical relevance, $p\text{-value} < 0,01$, while the size presented $p\text{-value} < 0,05$.

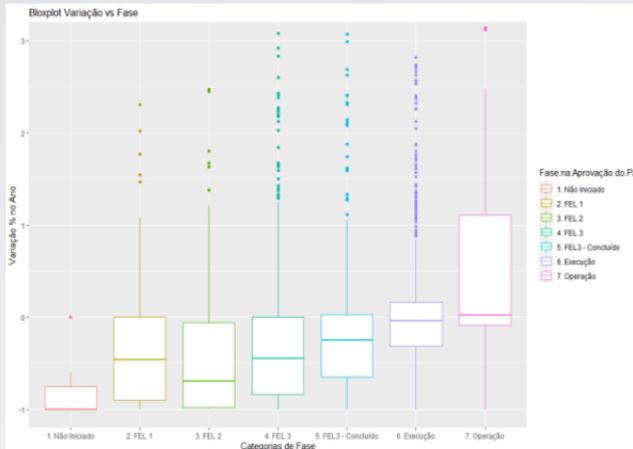
Problem and Data

- In Project management environment, predictability is a key issue to allow project execution by the best cost and shortest deadline. By concept, each project is unique and drives part of the company strategy, so to be a competitive player is necessary to conciliate complexity and volatility environment with the medium and long term business strategy.
- In this context, this study has aimed to describe the behavior of investments against established parameters, evaluate relationships between these and create subsidy to enable future studies and applications of machining learning and artificial intelligence in the universe of project and portfolio management.
- To achieve the goal was took under evaluation a historical database from a multinational petrochemical industry and applied on this descriptive analyses and logistic regression.



Methods

- Taking the database on hands, one parameter defined by the literature (project maturity) and two others established by the common sense of the professionals (size and execution condition) was evaluated through descriptive statistic and logistic regression to make sure about a existent correlation and the influence level of each one.



$$\Delta Range = \beta_0 + \beta_1 Maturity + \beta_2 Size + \beta_3 Execution Condition$$

Model 1

$$\Delta Range = \beta_0 + \beta_1 Maturity + \beta_2 Size$$

Model 3

P.S.: The third model has been chosen on study conclusion

Results and Conclusions

- The influence of the independent categorical variables phase/maturity and size of the investment in the dependent variable deviation range were confirmed. By the other hand, the influence of the execution condition was demystified, showing no correlation.
- It has created subsidy to enable future studies and applications that allow the application of more robust tools for data processing and analysis, such as machining learning and artificial intelligence. A recommendation for the next studies is design a algorithmic to identify possible impacts not yet known, and promote good predictability.

Parameters	OR	2,50%	97,50%
Intercept	0,1326349	0,0821393	0,2141728
Phase 4 FEL 3	1,3855640	0,84241909	2,2788983
Phase 5 FEL3 - Completed	2,5663116	1,56979435	4,1954254
Phase 6 Execution	3,5188736	2,20462786	5,6165814
Phase 7 Operation	3,9426448	2,17107374	7,1597972
Size 2 From BRL 500 k to BRL 4 MM	0,7683552	0,62409903	0,9459552
Size 3 From BRL 4 MM to 15 MM	0,7081877	0,52566687	0,9540829
Size 4 From BRL 15 MM to 50 MM	0,5457566	0,27766852	1,0726828
Size 5 Above R\$ 50 MM	1,3425326	0,39398323	4,5747982

Parameters Exponents Values of each Stratum in Model 3