

Strategic Alignment

Rational Choices

Common problem

The purpose of this talk is to propose a method for improving organizational coherence in situations where diverse stakeholder alignment is required. We assert that the traditional project success parameters known as the triple-constraint are still credible objectives:

- On time
- On budget
- With adequate scope and quality

However, we propose that there is another dimension which is often overlooked which may be a larger cause of perceived project failure:

- Lack of project alignment with organizational strategy

“Butting Heads”

The methodology proposed here can be used in an organization whenever there are competing objectives which require alignment among diverse stakeholders.

We will demonstrate the process for the following case studies:

- Quarterly strategic technology project planning process
- Setting strategic direction for a technology startup

The technique can also be used to prioritize requirements against ‘features’ of a new product to develop a release plan optimized to deliver the highest value first – though this is not demonstrated in this conversation (looking for a case study).

Proposed Methodology

The process described here uses a rational - quantitative approach to get alignment between multiple stakeholders who may not agree. The process consists of the following activities

1. Develop a 'value framework' against which project choices can be evaluated
2. Rank objectives in the framework with key stakeholders using a modified Analytic Hierarchy Process. The resulting value framework objectives can be viewed as a basis for the grouping of investment tranches.
3. Identify possible project portfolio selection options
4. Rank selection options against the value framework
5. Optimize the selections based on constrained resources (budget, staff, time) using a modified Efficient Frontier analysis technique.

Background

The original work for this methodology is based on something called the Analytic Hierarchy Process (AHP).

Identify the criteria to evaluate
(no more than 10 items)



Use Pairwise Comparisons
and calculate
Normalized Principal Eigenvector
(using the Row Geometric Mean Method)

Matrix		Criterion 1	Criterion 2	Criterion 3	0	0	0	0	0	0	0	normalized principal Eigenvector
		1	2	3	4	5	6	7	8	9	10	
Criterion 1	1	1	5	1/3	-	-	-	-	-	-	-	27,9%
Criterion 2	2	1/5	1	1/7	-	-	-	-	-	-	-	7,2%
Criterion 3	3	3	7	1	-	-	-	-	-	-	-	64,9%
0	4	-	-	-	1	-	-	-	-	-	-	0,0%
0	5	-	-	-	-	1	-	-	-	-	-	0,0%
0	6	-	-	-	-	-	1	-	-	-	-	0,0%
0	7	-	-	-	-	-	-	1	-	-	-	0,0%
0	8	-	-	-	-	-	-	-	1	-	-	0,0%
0	9	-	-	-	-	-	-	-	-	1	-	0,0%
0	10	-	-	-	-	-	-	-	-	-	1	0,0%

Background

We can compare each item to each other in a pair-wise manner where intensities x , with $x = 1$ to 9 (integer) are transformed into c using following possible relations **:

1- Linear $c = x$

2- Logarithmic $c = \log_2(x + 1)$

3- Root square $c = \sqrt{x}$

4- Inverse linear $c = 9/(10 - x)$

5- Balanced $c = w/(1 - w); \quad w = \{0.5, 0.55, 0.6, \dots, 0.9\}$

$$c = \frac{0.45 + 0.05x}{1 - (0.45 + 0.05x)}$$

6- Power $c = x^2$

7- Geometric $c = 2^{x-1}$

c is then used as element in the pair-wise comparison matrix.

** Ishizaka A., Labib A. Review of the main developments in the analytic hierarchy process, Expert systems with Applications, 38(11) 14336 – 14345, 2011

Example - strategic alignment

In this example we look at choices an organization that disagreed on which projects to do first - a traditional portfolio problem - with a twist. Here is the general process we went through:

1. Develop a 'value framework' against which project choices can be evaluated
2. Rank objectives in the framework with key stakeholders using a modified Analytic Hierarchy Process. The resulting value framework objectives can be viewed as a basis for the grouping of investment tranches.
3. Identify possible project portfolio selection options
4. Rank selection options against the value framework
5. Optimize the selections based on constrained resources (budget, staff, time) using a modified Efficient Frontier analysis technique.

Example - strategic alignment

In this example we look at choices an organization that disagreed on which projects to do first - a traditional portfolio problem - with a twist.

- The organization had fundamental disagreements about which projects to implement with limited resources.
- All of the projects could not be done in the given budget period
- Someone had to lose, no one was willing to give ground.
- Doing anything was better than doing nothing but choosing the 'something' mattered.

Example - strategic choices

In this hypothetical example for an IT group in an organization, we begin with a possible list of potential strategic areas of focus for the upcoming fiscal year:

1. Improve the external (student and faculty) user experience.
2. Improve the internal (administrator) user experience.
3. Improve the operational efficiency of the infrastructure.
4. Improve the operational efficiency of the applications.
5. Develop competitive differentiators.

Example - strategic choices

We chose a simple comparison model - compare each item to each other in a pairwise manner where:

- Factor A is extremely more important than Factor B
- Factor A is much more important than Factor B
- Factor A is more important than Factor B
- Factor A is as important as Factor B
- Factor A is less important than Factor B
- Factor A is much less important than Factor B
- Factor A is extremely less important than Factor B

Example - strategic choices

Let's compare each item to each other in a pair-wise linear manner where:

Description	Value
is extremely more important than	9.00
is much more important than	6.00
is more important than	3.00
is as important as	1.00
is less important than	0.30
is much less important than	0.20
is extremely less important than	0.10

	External User Experience	Internal User Experience	Operational Efficiency (infrastructure)	Operational Efficiency (applications)	Competitive Differentiator
External User Experience	is as important as	is more important than	is much more important than	is much more important than	is more important than
Internal User Experience	is less important than	is as important as	is more important than	is more important than	is more important than
Operational Efficiency (infrastructure)	is much less important than	is less important than	is as important as	is as important as	is less important than
Operational Efficiency (applications)	is much less important than	is less important than	is as important as	is as important as	is less important than
Competitive Differentiator	is less important than	is less important than	is more important than	is more important than	is as important as

Example - strategic choices

Based on this model we can then calculate a normalized relative ranking of each driver.

This is our Value Framework

Rank	Ranked Business Drivers	Score
1	External User Experience	47.33%
2	Internal User Experience	24.21%
3	Competitive Differentiator	15.22%
4	Operational Efficiency (infrastructure)	6.62%
5	Operational Efficiency (applications)	6.62%

Example - strategic choices

Now let's look at possible choices of projects to choose :

\$425K	Web site redesign
\$260K	Develop an enhanced disaster recovery infrastructure
\$949K	Develop a business process automation framework.
\$125K	Develop a data warehousing and reporting infrastructure
\$125K	Implement data center provisioning automation

Example - strategic choices

How do these choices rank against our Value Framework:

	External User Experience	Internal User Experience	Operational Efficiency (infrastructure)	Operational Efficiency (applications)	Competitive Differentiator
Business Process Automation	Moderate	Extreme	Low	Strong	Moderate
Web Site	Extreme	Strong	Low	Strong	Strong
Reporting Infrastructure	Moderate	Strong	Low	Low	Moderate
Data Center Automation	Low	Moderate	Extreme	Strong	Low
Disaster Recovery	Strong	Strong	Strong	Strong	Strong

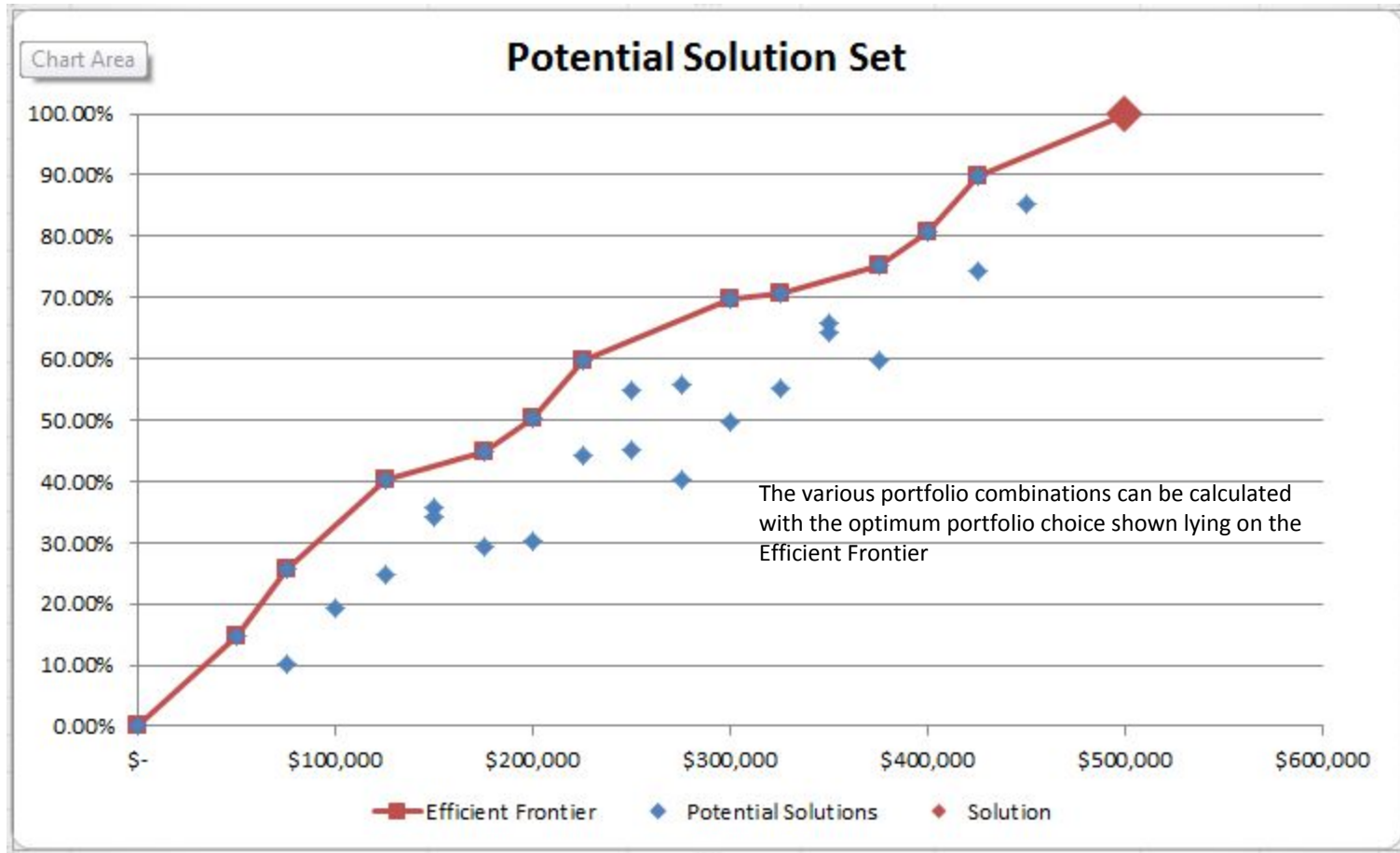
Description	Value
Extreme	9
Strong	6
Moderate	3
Low	1
None	0
No Rating	0

Example - strategic choices

Here are the value scores:

Rank	Ranked Project Groups	Score
1	Web Site	30.28%
2	Disaster Recovery	25.63%
3	Business Process Automation	19.30%
4	Reporting Infrastructure	14.78%
5	Data Center Automation	10.01%

Optimizing the portfolio



Example - Portfolio

Here is a proposed portfolio selection. Given a maximum budget of \$2,000,000 - if we exclude the lowest strategic value project (4)- we can expect to achieve 89.99 % possible value for \$ 1,759,00

ID	Project Group	Strategic Score	Proposed Cost
1	Business Process Automation	19.30%	\$ 949,000
2	Web Site	30.28%	\$ 425,000
3	Reporting Infrastructure	14.78%	\$ 125,000
4	Data Center Automation	10.01%	\$ 250,000
5	Disaster Recovery	25.63%	\$ 260,000
		Total Cost:	\$ 2,009,000
		Constraint:	\$ 2,000,000
		Maximum Score:	89.99%
		Solution Cost:	\$ 1,759,000

Results

- Choices of projects selected were surprising.
- Everyone agreed to the new priorities, even those who had a VERY strong opinion go in.
- The choices were clear when the emotion was removed.
- Clear way of balancing choices against constrained resources

Another example

In this hypothetical example, a tech startup is at a crossroads - two years into the development of a new product line and is faced with choices of where to spend limited resources. The choices identified are:

- Improve Operational Uptime
- Improve End User Experience
- Improve Product Development Efficiency
- Improve Cost Management / Revenue Flow
- Increase Market Depth / Reach
- Improve Brand Awareness

Another example

Tech Startup v2	Improve Operational Uptime	Improve End User Experience (UI)	Improve Development Efficiency	Improve Cost Management/Revenue Flow	Increase Market Depth/Reach	Improve Brand Awareness
Improve Operational Uptime	is as important as	is more important than	is more important than	is as important as	is more important than	is much more important than
Improve End User Experience (UI)		is as important as	is more important than	is less important than	is less important than	is as important as
Improve Development Efficiency			is as important as	is less important than	is less important than	is more important than
Improve Cost Management/Revenue Flow				is as important as	is more important than	is more important than
Increase Market Depth/Reach					is as important as	is as important as
Improve Brand Awareness						is as important as

Another example

Tech Startup v2	Improve Operational Uptime	Improve End User Experience (UI)	Improve Development Efficiency	Improve Cost Management /Revenue Flow	Increase Market Depth /Reach	Improve Brand Awareness			
Improve Operational Uptime	1	3	3	1	3	6			
Improve End User Experience (UI)	0.6	1	3	0.6	0.6	1			
Improve Development Efficiency	0.6	0.6	1	0.6	0.6	3			
Improve Cost Management/Revenue Flow	1	3	3	1	3	3			
Increase Market Depth/Reach	0.6	3	3	0.6	1	1			
Improve Brand Awareness	0.3	1	0.6	0.6	1	1			
	4.1	11.6	13.6	4.4	9.2	15			
Improve Operational Uptime	0.244	0.259	0.221	0.227	0.326	0.400	1.676	27.9%	1
Improve End User Experience (UI)	0.146	0.086	0.221	0.136	0.065	0.067	0.721	12.0%	4
Improve Development Efficiency	0.146	0.052	0.074	0.136	0.065	0.200	0.673	11.2%	5
Improve Cost Management/Revenue Flow	0.244	0.259	0.221	0.227	0.326	0.200	1.476	24.6%	2
Increase Market Depth/Reach	0.146	0.259	0.221	0.136	0.109	0.067	0.937	15.6%	3
Improve Brand Awareness	0.073	0.086	0.044	0.136	0.109	0.067	0.515	8.6%	6

Results

- Group of stakeholders included the CEO, COO, CIO and other senior staff of a small technology startup.
- The opinions were initially very split between investing in improving market position by better advertizing or improving their operational delivery capability.
- At the end of the exercise they realized they urgently needed to improve their operational capability and improve their cash flow. Expanding their market share would have actually hurt them.

Areas for additional study

- How effective are the results of the process.
- Does changing the pair-wise calculation change the results significantly?
- How does this process fit into the organizational / political climate of the organization?
- Does the model really matter - maybe it's just the process that facilitates dialog - breaking the log jam.
- Look at analytics for data Consistency and Diversity.

Thoughts?

Thank you for your time...

References

- [1] Archer, N.P., Ghasemzadeh, F. "An integrated framework for Project Portfolio Management" International Journal of Project Management, Vol. 17, No.4
- [2] Benaroch M., Kauffman R. "A case for using option pricing analysis to evaluate information technology project investments." Information Systems Research, vol 10, 1999
- [3] F. Black and M. S. Scholes. "The pricing of options and corporate liabilities". Journal of Political Economy, 81(3):637–54, May-June 1973
- [4] Boehm, Barry W., "Software Engineering Economics", Prentice Hall, 1981.
- [5] Salvatore Cannella and Elena Ciancimino "Capacity constrained supply chains: a simulation study" International Journal of Simulation and Process Modeling, Vol. 4, No. 2, 2008 139
- [6] "2009 CHAOS Demographics and Project Resolution" Standish Group Quarterly Report, 2009
- [7] Cohen, D., Lindvall, M., Costa, P. "An Introduction to Agile Methods", Fraunhofer Center for Experimental Software engineering College Park, MD 20742
- [8] "Data and Analysis Center for Software report D016" DoD Software Information Clearing House, Rome Air Force Base, Rome, New York, <http://www.dacsstore.com/info.php>.
- [9] "Value of commercial software development under technology risk." The financier, 2001
- [10] Favaro J., Plfeeger S. "Making software development investment decisions.", Software Engineering Notes, vol. 25, 1998
- [11] Favaro J., Favaro K., "Strategic analysis of application framework investments.", Building Application Frameworks: Object Oriented Foundations of Framework Design. John Wiley and Sons, 1999
- [12] Xiaotong Li, University of Alabama in Huntsville John D. Johnson, University of Mississippi "Evaluate IT Investment Opportunities Using Real Options Theory", Information resources Management Journal, 15(3), 32-47, July-Sept. 2002
- [13] Lueherman, Timothy "Strategy as a Portfolio of Real Options", Harvard Business Review. September-October 1998
- [14] Markowitz, H. M. "Portfolio Selection : Efficient Diversification of Investments", New York, New York. John Wiley and Sons, 1959
- [15] Martino, Joseph P. "R & D Project Selection", New York, New York John Wiley and Sons, 1995.
- [16] Wiegers, Karl E. "Stop Promising Miracles", Software Development, February 2000
- [17] Goepel, Klaus D. . BPMSG AHP Excel Template with multiple Inputs Author – <http://bpmsg.com>
- [18] : Goepel, Klaus D., Implementing the analytic hierarchy process as a standard method for multi-criteria decision making in corporate enterprises – a new AHP excel template with multiple inputs. Proceedings of the international symposium on the analytic hierarchy process, Kuala Lumpur, Malaysia, 2013 (Submitted Feb. 2013).