

Understanding Business Drivers

Customer
Orientation

Lean
Six Sigma

Agile
Processes

Process
Metrics

Uncovering
Cause-Effect

Understanding Business Drivers for Software Products from Net Promoter® Score Surveys

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NET PROMOTER®
LOYALTY PARTNER

Whom do you believe?

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- **Scientific statement:**

- ➔ Explaining contents and impact on sensory nerves

- **Personal statement:**

- ➔ They taste so good!
So fresh!

What is Net Promoter Score?

If a friend or colleague would ask you: how likely are you to recommend <our product/service>?



Please tell us the reasons why you selected your score

Promoters – in % of total sample
– (minus)
Detractors – in % of total sample

Net Promoter Score (NPS)

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Customer Loyalty

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- Loyal Customers
 - ➔ Repurchase
 - ➔ Buy New Product Lines
 - ➔ Recommend, and
 - ➔ Give Feedback

- Small increase in NPS → Huge increase in future business
 - ➔ Net Customer Value (NCV)
 - Future business depreciated by NPV Discount Factor
 - ➔ Strong correlation between NPS and NCV

Word-of-Mouth Economics (WOM)

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What is the sales value of a positive recommendation?

- Assume:
 - ➔ Promoters make **5** positive referrals on average
 - ➔ Detractors make **4** negative referrals on average
 - ➔ One negative referral needs **6** or more positive counterweights
 - ➔ It takes **3** positive referrals to persuade prospect
 - ➔ New customers generated by referral are worth twice (2*) the average NCV;
 - ➔ Detractors buy over time only half (1/2) of average NCV
- Example:
 - ➔ Assume € 430'000 is average NCV
 - Promoters NCV is € 860'000 on average
 - Detractors NCV is € 215'000 on average
 - ➔ Promoters: € 860'000 + € 715'000 WOM (≙ **5/3** new customers) = **€ 1'575'000**
 - ➔ Detractors: € 215'000 – € 3'430'000 WOM (≙ **6*4/3** lost customers) = **€ -3'220'000**
- Future Growth is a matter of **% Promoters** – **% Detractors** = NPS

WOM Economics for B2B Software Products

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Word-of-Mouth Economics (WOM)

Test Sheet

Part 1: Net Customer Value (NCV) - New Customer 2010

Discount Factor:

Expected Profit per Year for Average Customer

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Revenue	€ 200'000	€ 50'000	€ 50'000	€ 50'000	€ 50'000	€ 100'000	€ 75'000	€ 75'000	€ 75'000	€ 75'000	€ 75'000
Total Cost	€ 150'000										
Net Profit	€ 50'000	€ 50'000	€ 50'000	€ 50'000	€ 50'000	€ 100'000	€ 75'000	€ 75'000	€ 75'000	€ 75'000	€ 75'000
Present Value	€ 50'000	€ 45'045	€ 40'581	€ 36'560	€ 32'937	€ 59'345	€ 40'098	€ 36'124	€ 32'544	€ 29'319	€ 26'414
Net Present Value	€ 428'968										

Part 2: Word-of-Mouth Economics

Average positive referrals per Promoter:	<input type="text" value="5"/>	Detractor NCV	<input type="text" value="50%"/>	€ 214'484
Average negative referrals per Detractor:	<input type="text" value="4"/>	Average NCV		€ 428'968
One negative referral needs	<input type="text" value="6"/>	Promoter NCV	<input type="text" value="200%"/>	€ 857'935
It takes	<input type="text" value="3"/>			

or more positive counterweights positive referrals to persuade prospect

Value of Promoter:	<u>€ 1'572'881</u>	(Promoter NCV + 5/3*Average NCV)	€ 857'935	+	€ 714'946
Value of Detractor:	<u>€ -3'217'257</u>	(Detractor NCV - 6*4/3*Average NCV)	€ 214'484	-	€ 3'431'740

Value of turning

Detractor -> Promoter: € 4'790'138

Business Growth Threshold

NPS = 34% (how many more promoters we need to outweigh detractors)

Typical B2B WOM Economics

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- NPS > 34 % means growth in market share
 - ➔ Promoters outweigh detractors
 - ➔ Otherwise, competition will gain, sooner or later

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Business Growth Threshold

NPS = 34%

Customer Priorities Map

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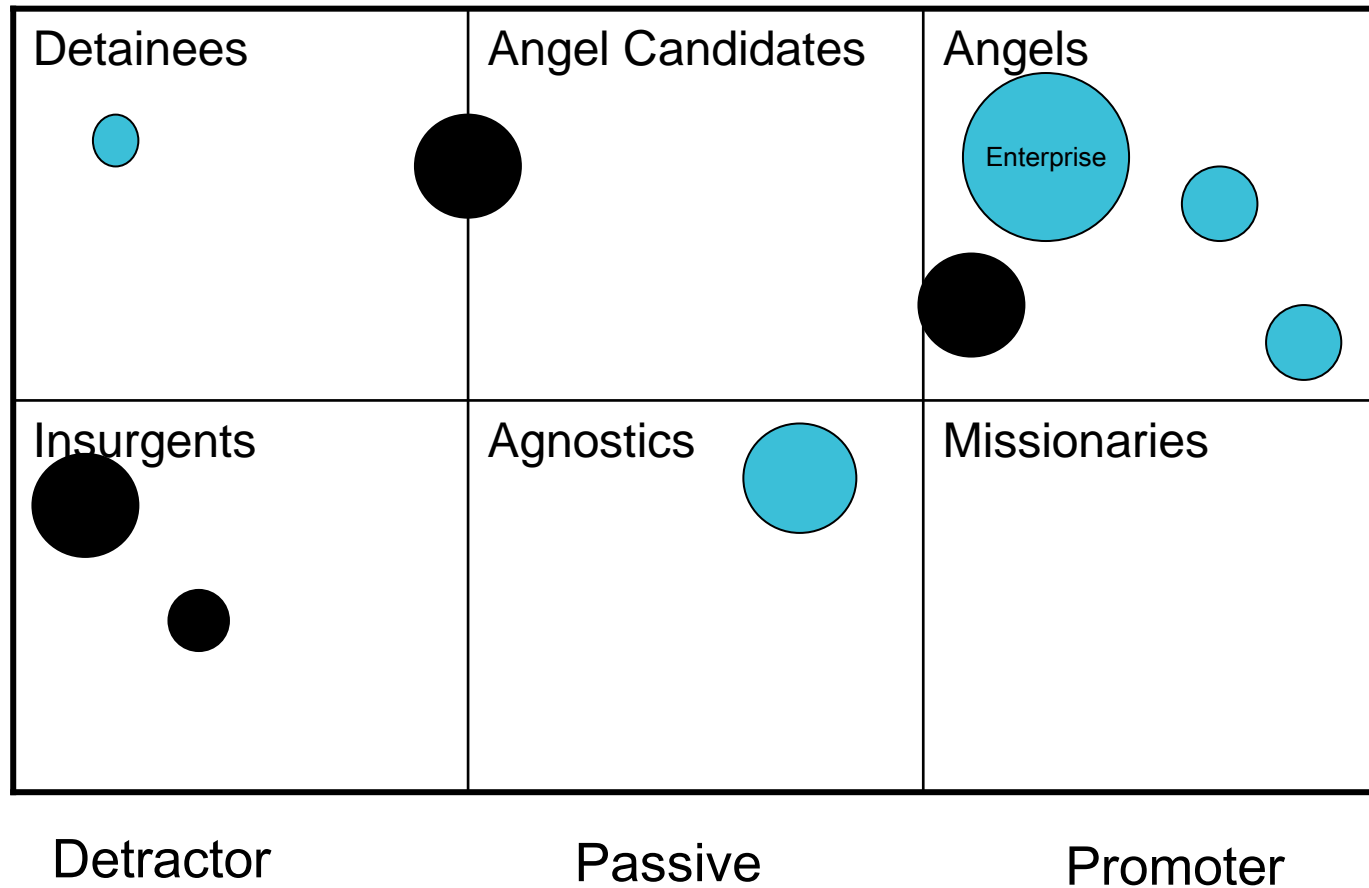
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High

Profitability

Low



What Can Be Done to Increase NPS?

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- Understand the Drivers for High NPS

- ➔ From relationship survey feedback
- ➔ From transactional surveys
 - After completing Sales, Licensing, Support, Project transactions
- ➔ Understand which Capabilities, Processes, and Qualities correlate with high NPS

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- Attack Root Causes

- ➔ Improve processes
 - Sales, Licensing, Support, Capabilities, and Qualities
- ➔ Institutionalize processes
 - Become predictable like a Swiss Clock!

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Transfer Function Business Drivers → NPS

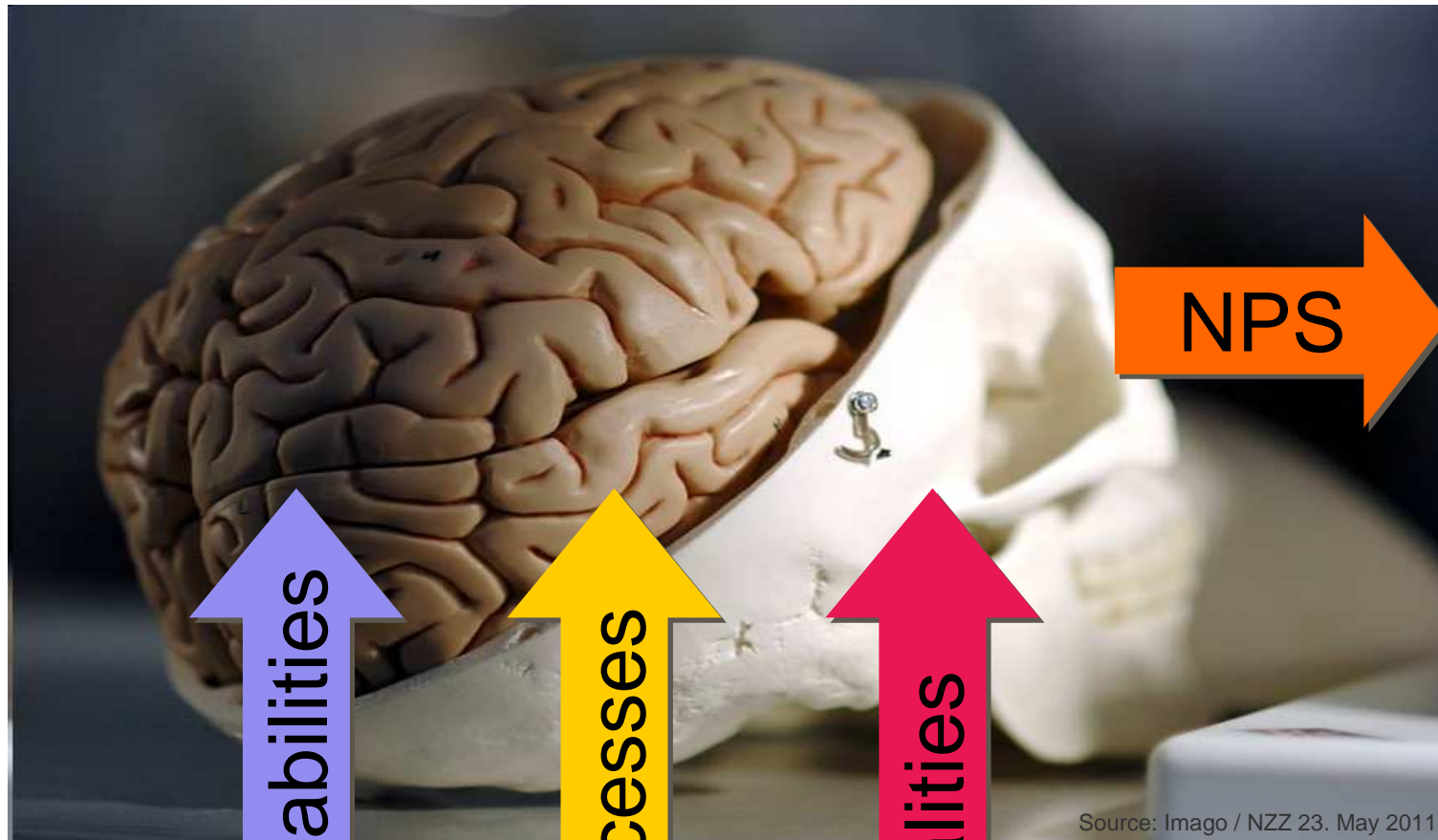
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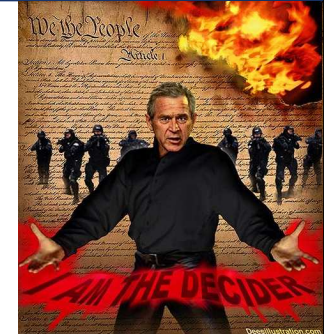
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Source: Imago / NZZ 23. May 2011

Customer Segmentation



● Roles

- ➔ Deciders – Member of the Board
- ➔ Influencers – Production / IT / Management
- ➔ Users – User of Software or Service

● Industries

- ➔ Enterprises
 - Integrate software with their core business
- ➔ Factories
 - Use software for providing isolated services

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NPS per Segment

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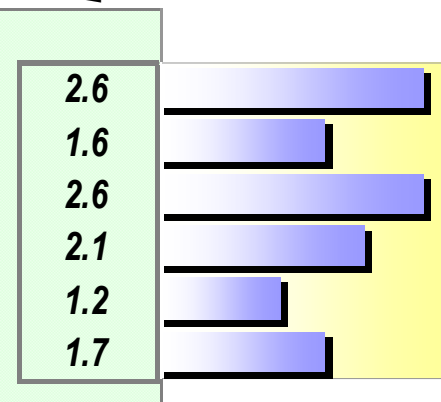
- Enterprise – Decider: NPS-E.1 50%
- Enterprise – Influencer: NPS-E.2 31%
- Enterprise – User: NPS-E.3 50%
- Factory – Decider: NPS-F.1 39%
- Factory – Influencer: NPS-F.2 23%
- Factory – User: NPS-F.3 31%

Segments equally weighted!

Net Promoter Score Profile

	Net Promoter Score
NPS-E Enterprises	NPS-E.1 Enterprise – Decider
	NPS-E.2 Enterprise – Influencer
	NPS-E.3 Enterprise – User
NPS-F Factories	NPS-F.1 Factory – Decider
	NPS-F.2 Factory – Influencer
	NPS-F.3 Factory – User

NPS Profile



Business Drivers (proposed)

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	<i>Topics</i>	<i>Attributes</i>
BD-1 Capabilities	BD-1.1 Capability - Management	BD-1.1.1 Ability to track and manage actions
	BD-1.2 Capability - Integration	BD-1.2.1 Integrate with other applications
	BD-1.3 Capability - Design	BD-1.3.1 Appearance and relevance of output
BD-2 Processes	BD-2.1 License Policy	BD-2.1.1 Licenses, contracts, T's & C's
	BD-2.2 Ease of Doing Business	BD-2.2.1 Support, responsiveness, competence
BD-3 Qualities	BD-3.1 Product - Timeliness	BD-3.1.1 Deliver new features in time
	BD-3.2 Product - Reliability	BD-3.2.1 High product quality, no bugs

- Capabilities
- Processes
- Qualities



Verbatim Analysis

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7	It depends on the type of application you're looking for
5	cost
10	Easy to use - Just what we needed to optimize
7	Zkvalitnění spolupráce v posledních měsících
7	Software hodnotím jako komplexně dobré řešení
10	The software suite gives me the technology I need
8	Overall the product works as advertised and

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-2		1				
			-3			
1		1		1		
				2		1
						2
1		1				1
1	1					-1

Importance: 3
Satisfaction: -3

44	19	68	15	84	13	72
32	13	64	-7	36	7	56
Capability - Management	Capability - Integration	Capability - Design	License Policy	Ease of Doing Business	Product - Timeliness	Product - Reliability

Importance
Satisfaction

Verbatim Analysis

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Importance Counting Method

- **Three points are assigned to each respondent, which can be distributed among the business drivers**
 - ➔ This rule forces the analyst to investigate into the response focus in the free text supplied by customers
 - ➔ Points can be distributed as follows:
 - 1–1–1 among three business drivers
 - 2–1 if one driver is strongly accentuated
 - 3–0 if the answer is single focused on one aspect only
 - ➔ Weak affirmation or answers too general can reduce the total number of points given to two or one
- The analysis returns a frequency metric that measures the importance given to each of the business drivers



Verbatim Analysis

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Satisfaction Counting Method

- **Each of the three points assigned for importance can become negative**
 - ➔ Their absolute total still not exceeding 3!
 - ➔ Missing satisfaction can yield negative impact on NPS
- **Both importance and satisfaction frequency metrics should explain the observed NPS**
 - ➔ Otherwise you have to assume that customers recommend what they don't deem important
 - ➔ Or they recommend despite not being satisfied



Validation of Analysis

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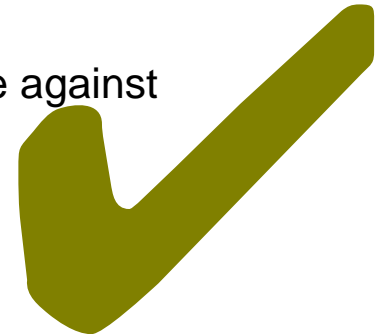
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- The profile of the response must explain the score
 - NPS measures whether people are inclined to recommend
 - Business Drivers must be important enough
 - Respondents must be satisfied with performance against business drivers

- What if score is not explained?
What if Convergence Gap remains widely open?
 - Wrong Business Drivers selected, or
 - Verbatim not understood correctly
 - Needs time-consuming investigation, or
 - A different interpretation may close convergence gap



Transfer Function

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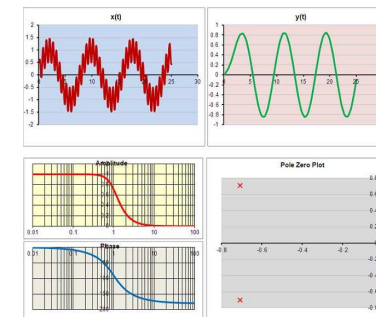
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- Transfer functions origin from analysis of systems such as single-input single-output filters
- In Design for Six Sigma, they are used for designing processes that deliver responses at defined variability levels
 - ➔ They describe how a profile vector \underline{x} of controls impacts the response profile vector \underline{y} of the process: $\underline{y} = \mathcal{T}(\underline{x})$
- The process under question is the survey process \mathcal{T}
 - ➔ The controls are the Business Drivers
 - ➔ The observed response is the Net Promoter Score (NPS)



Prediction and Transfer Function

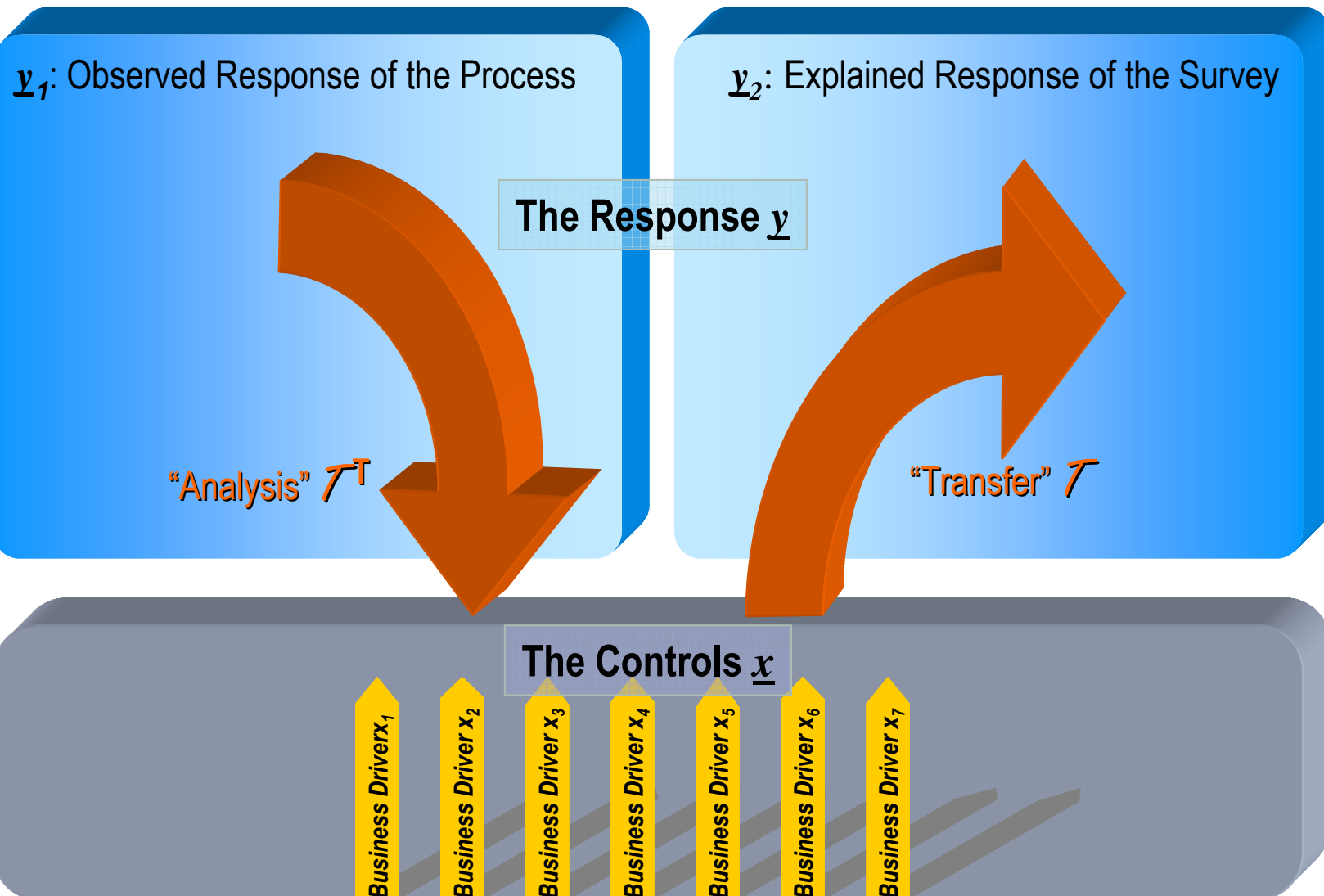
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Finding Eigenvectors

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- The so-called “Annihilator” method
 - Intersects the vector space with its **Dual Vector Space**
 - i.e., the vector space spanned up by the transposed base vectors of the original vector space
 - Matrices in the dual vector space are **transposed**
 - Dual vector spaces are a powerful concept for analyzing behavior and topology of multilinear vector spaces

$$\mathcal{T} = \begin{bmatrix} \tau_{1,1} & \tau_{1,2} & \cdots & \tau_{1,m} \\ \tau_{2,1} & \tau_{2,2} & \cdots & \tau_{2,m} \\ \cdots & \cdots & \cdots & \cdots \\ \tau_{n,1} & \tau_{n,2} & \cdots & \tau_{n,m} \end{bmatrix} \quad \xrightarrow{\text{transpose}} \quad \mathcal{T}^T = \begin{bmatrix} \tau_{1,1} & \tau_{2,1} & \cdots & \tau_{n,1} \\ \tau_{1,2} & \tau_{2,2} & \cdots & \tau_{n,2} \\ \cdots & \cdots & \cdots & \cdots \\ \tau_{1,m} & \tau_{2,m} & \cdots & \tau_{n,m} \end{bmatrix}$$

- $\mathcal{T} \bullet \mathcal{T}^T$ is a positive, rectangular matrix that has Eigenvalues λ and thus Eigenvectors \underline{y} : $[\mathcal{T} \bullet \mathcal{T}^T](\underline{y}) = \mathcal{T}(\mathcal{T}^T(\underline{y})) = \lambda \underline{y}$

The Convergence Gap

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- The **Convergence Gap** describes how much the achieved response from a Transfer Function \mathcal{T} differs from the observed response

$$\| \underline{y} - \mathcal{T}(\mathcal{T}^T(\underline{y})) \|$$



- The profile \underline{y} is called a **Decision Metrics** for the Transfer Function \mathcal{T} if there is an $\varepsilon > 0$ such that the vector distance $\| \underline{y} - \mathcal{T}(\mathcal{T}^T(\underline{y})) \| < \varepsilon$

Attenuation of the Verbatim Signal

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- Neutrals add a verbatim to their score, but the metric collapses the referral scores onto two percentages
- High ratio of neutrals dampens the NPS while their verbatim signal is the same as from low ratio
 - ➔ Absorb the excess verbatim signal that originates from the total number of points given during verbatim analysis

Promotors	Neutrals	Detractors	Total	NPS	Signal Strength	Attenuation Factor	Adjusted Strength
133	0	67	200	33%	600	1.00	600
90	77	33	200	29%	600	0.62	369
67	100	33	200	17%	600	0.50	300
44	133	22	200	11%	600	0.33	200

Analysis – Importance

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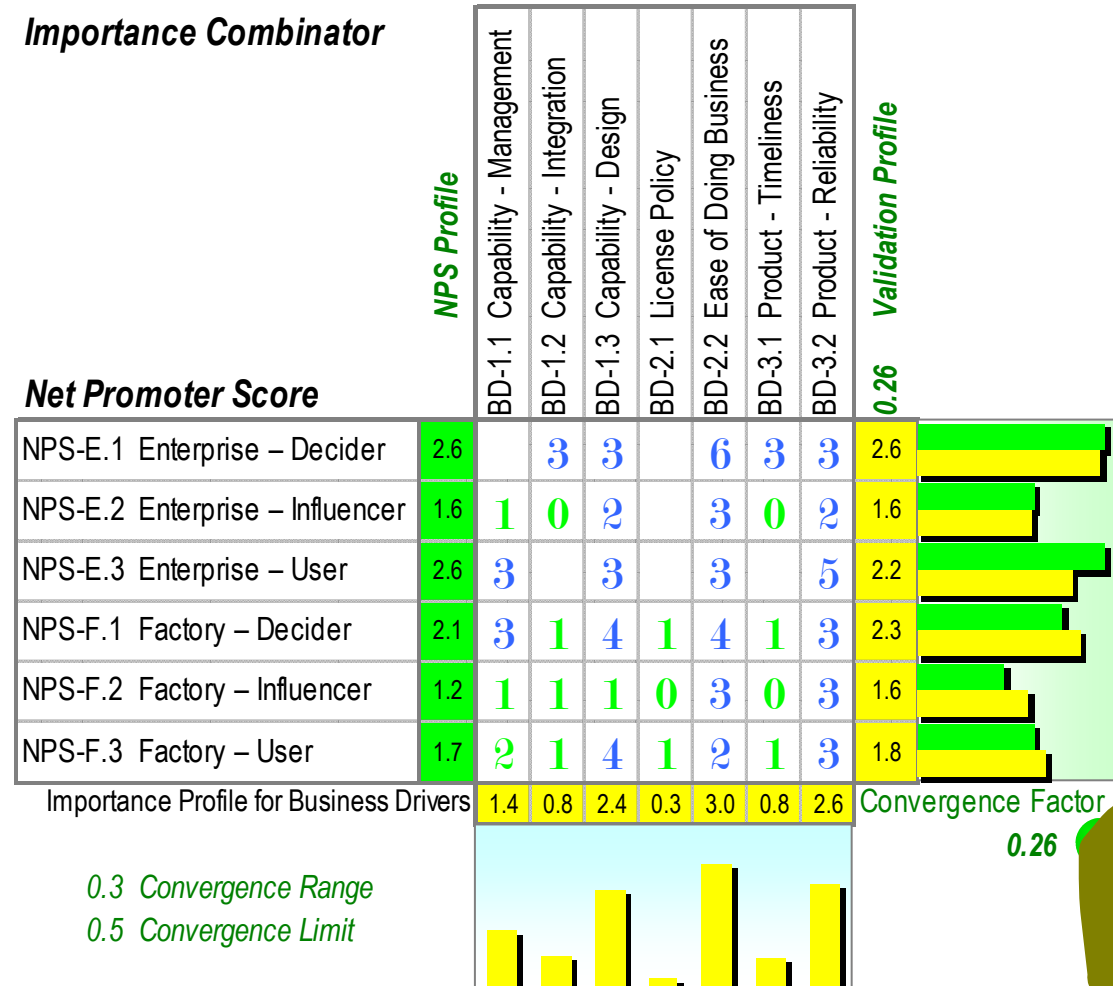
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Business Drivers Importance Combinator

Business Drivers



Analysis – Satisfaction

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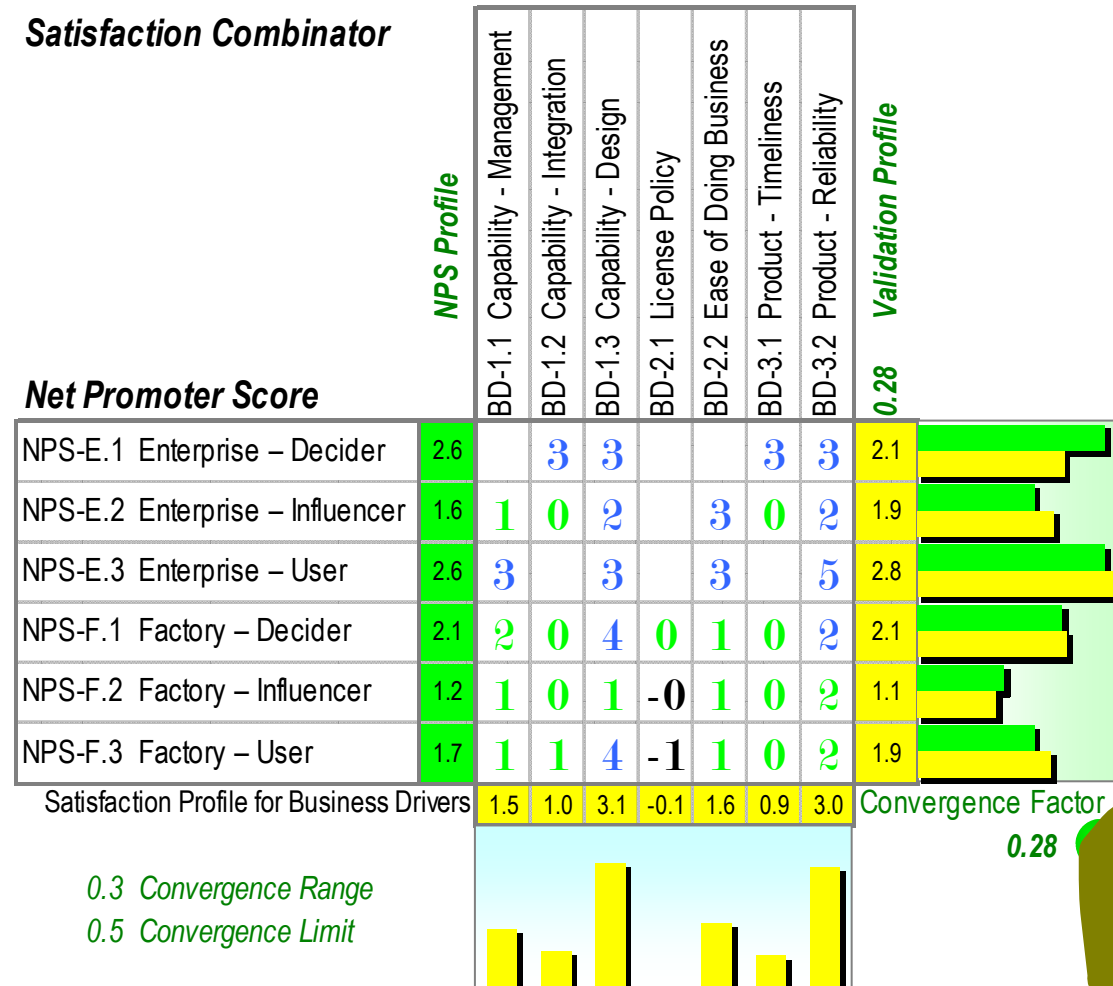
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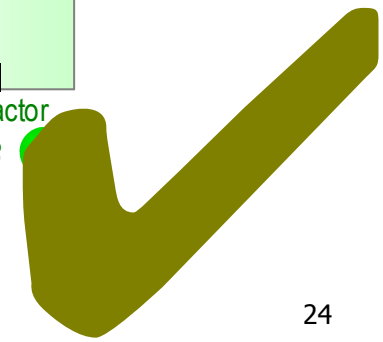
Business Drivers Satisfaction Combinator

Business Drivers



0.3 Convergence Range
0.5 Convergence Limit

0.28



Compare Importance and Satisfaction

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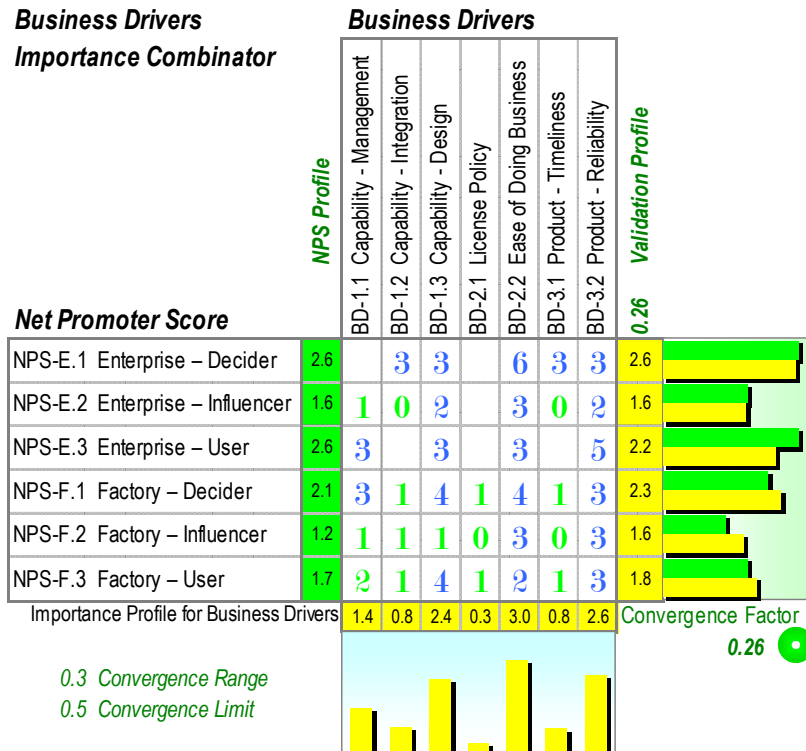
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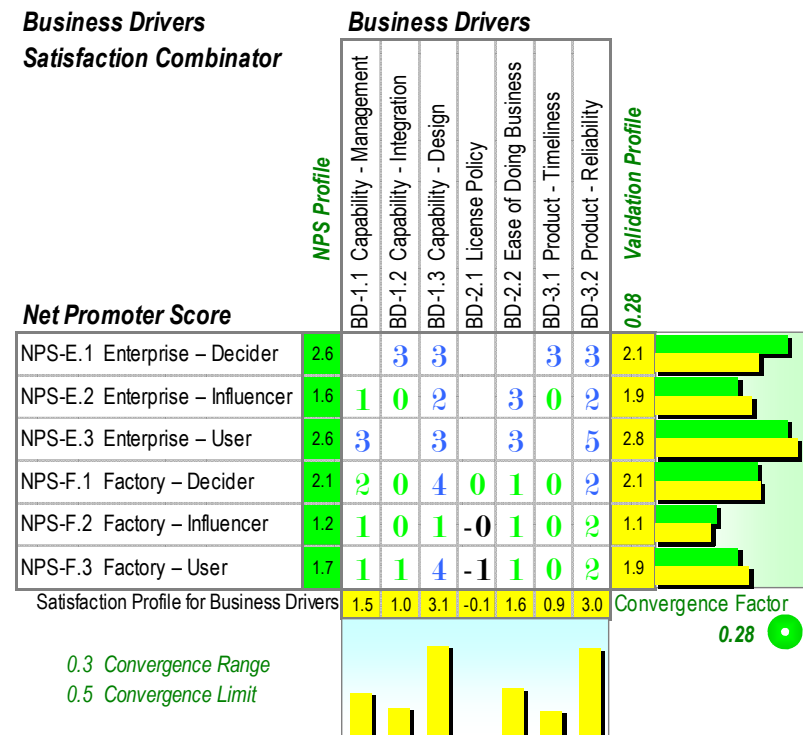
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Business Drivers Importance Combinator



Business Drivers Satisfaction Combinator



Problem with Licensing

Problem with Ease of Doing Business

Measurement Errors?

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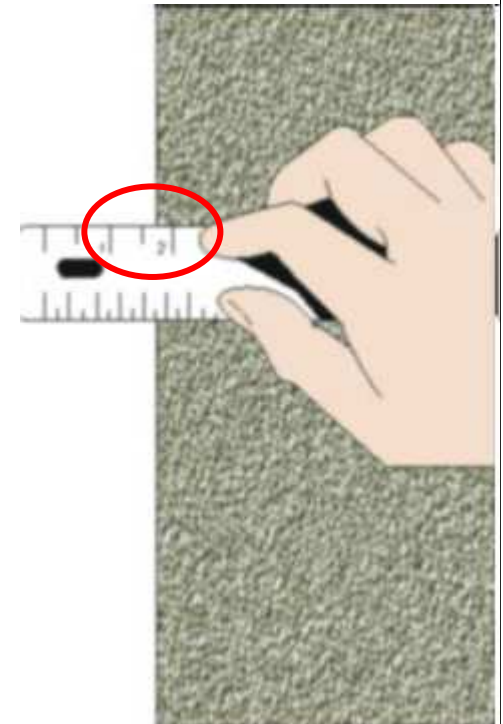
- What happens of
 - ➔ Verbatim Analysis is wrong?
 - ➔ Business Driver Selection is wrong?

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Measurement Errors in the Verbatim Analysis

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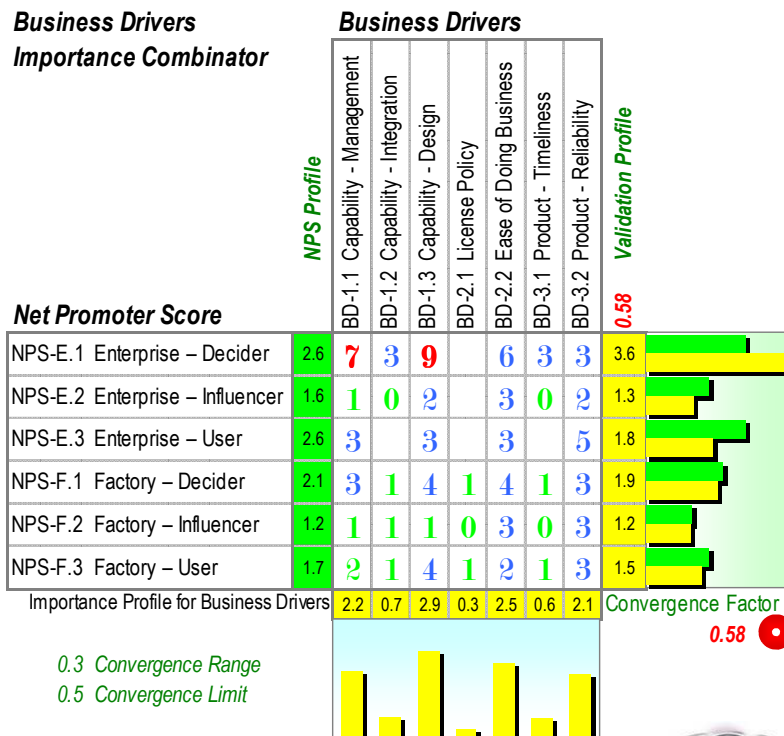
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Business Drivers Importance Combinator

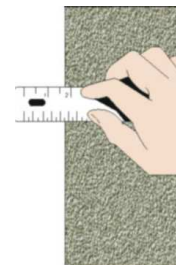


- The convergence gap identifies measurement errors

- ➔ There is room for interpretation
- ➔ Wrong interpretation causes convergence gap to open

- For instance

- ➔ Counting a verbatim as high importance that wasn't meant that way causes the signal becoming too strong
- ➔ Consequence: the convergence gap opens



Invalid Analysis – Wrong Business Driver

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- Replacing
 - ➔ BD-2.1: License Policy
- by
 - ➔ BD-2.a: Support Policy
- Support is mentioned often in conjunction with BD-2.2: ‘Ease of Doing Business’ but with different wording by deciders and influencers
- Thus BD-2.2 and BD-2.a both filter the same signal, loosing the BD-2.1 ‘License’
 - ➔ Analysis no longer valid

Business Drivers Importance Combinator

Business Drivers

Net Promoter Score	Business Drivers							Validation Profile	
	BD-1.1 Capability - Management	BD-1.2 Capability - Integration	BD-1.3 Capability - Design	BD-2.a Support Policy	BD-2.2 Ease of Doing Business	BD-3.1 Product - Timeliness	BD-3.2 Product - Reliability		
NPS-E.1 Enterprise – Decider	2.6	3	3	6	6	3	3	2.8	
NPS-E.2 Enterprise – Influencer	1.6	1	0	2	6	3	0	2.1	
NPS-E.3 Enterprise – User	2.6	3		3			5	1.7	
NPS-F.1 Factory – Decider	2.1	3	1	4	1	4	1	3	1.9
NPS-F.2 Factory – Influencer	1.2	1	1	1	6	3	0	3	2.0
NPS-F.3 Factory – User	1.7	2	1	4	1	2	1	3	1.5
Importance Profile for Business Drivers	1.3	0.8	2.1	2.3	2.7	0.7	2.3	0.54	

0.3 Convergence Range
0.5 Convergence Limit



Conclusion

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- NPS Surveys are popular because
 - ➔ Only the 'Ultimate Question'
 - ➔ Short and Flexible
- Analyzing NPS is more demanding than traditional survey
 - ➔ Six Sigma Eigenvector Theory provides suitable technique
- The real benefit is
 - ➔ You learn from the customer the Unexpected
 - ➔ Opportunity to improve both
 - **Processes**, and
 - **Product**

*Now we understand
customer's business goal!
From just one question*



Questions?

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Backup

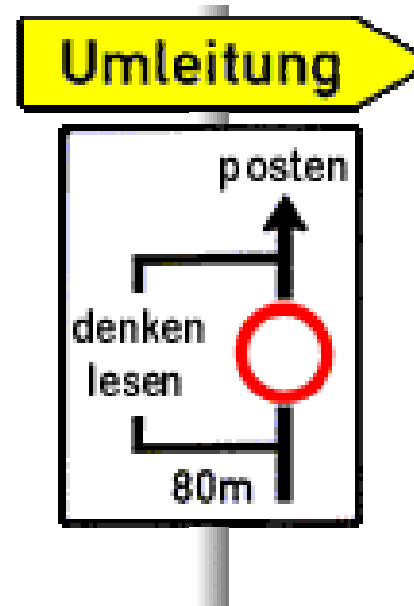
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Validation of the Transfer Function

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- The Response is known
 - ➔ By measurement – customer preferences
 - ➔ By business strategy decisions
- The verbatim analysis must be validated
 - ➔ It defines the Transfer Function
 - ➔ Analysis contains measurement errors
 - Verbatim Analysis produces a solution profile
 - Solution profile must explain the observed measurements
 - ➔ Dual Vector Space:
 - Eigenvector of $\mathcal{T} \cdot \mathcal{T}^T$ eliminates measurement errors
- The Controls are measurable; validated profile compares with
 - ➔ Functional Size of Capabilities
 - ➔ Total Effort spent on Qualities
 - ➔ Total Cost of Processes

$$\mathcal{T}(\underline{\mathbf{x}}) = \underline{\mathbf{y}}$$

Eigenvector of a Transfer Function \mathcal{T} – Math!

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- The goal profile $\underline{y} = \langle y_1, y_2, \dots, y_m \rangle$ describes business goals
- Solution with profile $\underline{x} = \langle x_1, x_2, \dots, x_n \rangle$ such that $\mathcal{T}(\underline{x}) = \underline{y}$ is requested
- **Quality is linear:**
 - ➔ Thus \mathcal{T} can be written as an $n \times m$ matrix
 - ➔ The transpose \mathcal{T}^T is an $m \times n$ matrix
- Note $\mathcal{T} \bullet \mathcal{T}^T$ is a square matrix ($m \times m$); $[\mathcal{T} \bullet \mathcal{T}^T](\underline{y}) = \mathcal{T}(\mathcal{T}^T(\underline{y}))$, $\forall \underline{y}$
- Note that $\mathcal{T} \bullet \mathcal{T}^T$ is not the Identity function!
 - ➔ Since cause/effect cannot be reversed!
- An **Eigenvector** \underline{y} fulfills the equation

$$[\mathcal{T} \bullet \mathcal{T}^T](\underline{y}) = \lambda \underline{y}$$
 - ➔ λ is a scalar number; we can set it to $\lambda = 1$ by normalization
 - ➔ If \underline{y} is an Eigenvector then $\underline{x} = \mathcal{T}^T(\underline{y})$ is the solution!
- We need to know how good the solution \underline{x} is for the goal \underline{y}
- The vector distance $\| \mathcal{T}(\underline{x}) - \lambda \underline{y} \|$ is called the **Convergence Gap**
- A small Convergence Gap means a good prediction, because
 - ➔ It can be repeated! $[\mathcal{T} \bullet \mathcal{T}^T](\underline{y}) = [\mathcal{T} \bullet \mathcal{T}^T]([\mathcal{T} \bullet \mathcal{T}^T](\underline{y}))$ is decision metrics!



Eigenvector of a Transfer Function \mathcal{T} – Easy!

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- The customer knows what he wants: \underline{y}
 - ➔ The NPS response profile
- Business knows their business domain
 - ➔ They know how \mathcal{T} works on controls \underline{x} !
 - ➔ They know how \underline{x} transforms into referrals $\mathcal{T}(\underline{x})$
- Does $\mathcal{T}(\underline{x})$ meet NPS Survey Response \underline{y} ?
 - ➔ Look at the difference between \underline{y} and $\mathcal{T}(\underline{x})$!
- This is the **Convergence Gap** $\|\underline{y} - \mathcal{T}(\underline{x})\|$
 - ➔ This is a measurement for process consistency!
 - ➔ This measurement **validates** the verbatim analysis

*We can predict whether
we will meet customer's
business goal!*

