

STLE: Schnellbacher, Emil Jon
1E, Metalworking Fluids 1
Monday May 17, 12:30 pm



Consistently Beating the Odds: How to Build Successful New Products

STLE Annual Meeting - May 17, 2021

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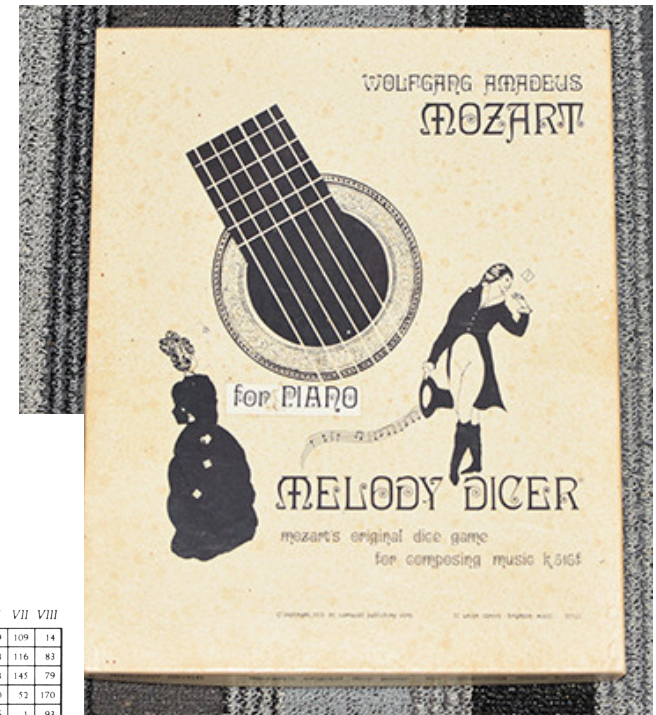
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**North American Chemical Manufacturers
Best Practices Study (NACM-BPS)**

What if.....



The Big Picture



WOLFGANG AMADEUS MOZART

Musikalisches Würfelspiel

Table of Measure Numbers

Part One								Part Two							
I	II	III	IV	V	VI	VII	VIII	I	II	III	IV	V	VI	VII	VIII
2	96	22	141	41	105	122	11	30	2	70	121	26	9	112	49
3	32	6	128	63	146	46	134	81	3	117	39	126	56	174	18
4	69	95	158	13	153	55	110	24	4	96	139	15	132	73	58
5	40	17	113	85	161	2	159	100	5	90	176	7	34	67	160
6	148	74	163	45	80	97	36	107	6	25	143	64	125	76	136
7	104	157	27	167	154	68	118	91	7	138	71	150	29	101	162
8	152	60	171	53	99	133	21	127	8	16	155	57	175	43	168
9	119	84	114	50	140	86	169	94	9	120	88	48	166	51	115
10	98	142	42	156	75	129	62	123	10	65	77	19	82	137	38
11	3	87	165	61	135	47	147	33	11	102	4	31	164	144	59
12	54	130	10	103	28	37	106	5	12	35	20	108	92	12	124

Table of Measures



Mozart created a system to randomly generate melodies

Levels of Innovation

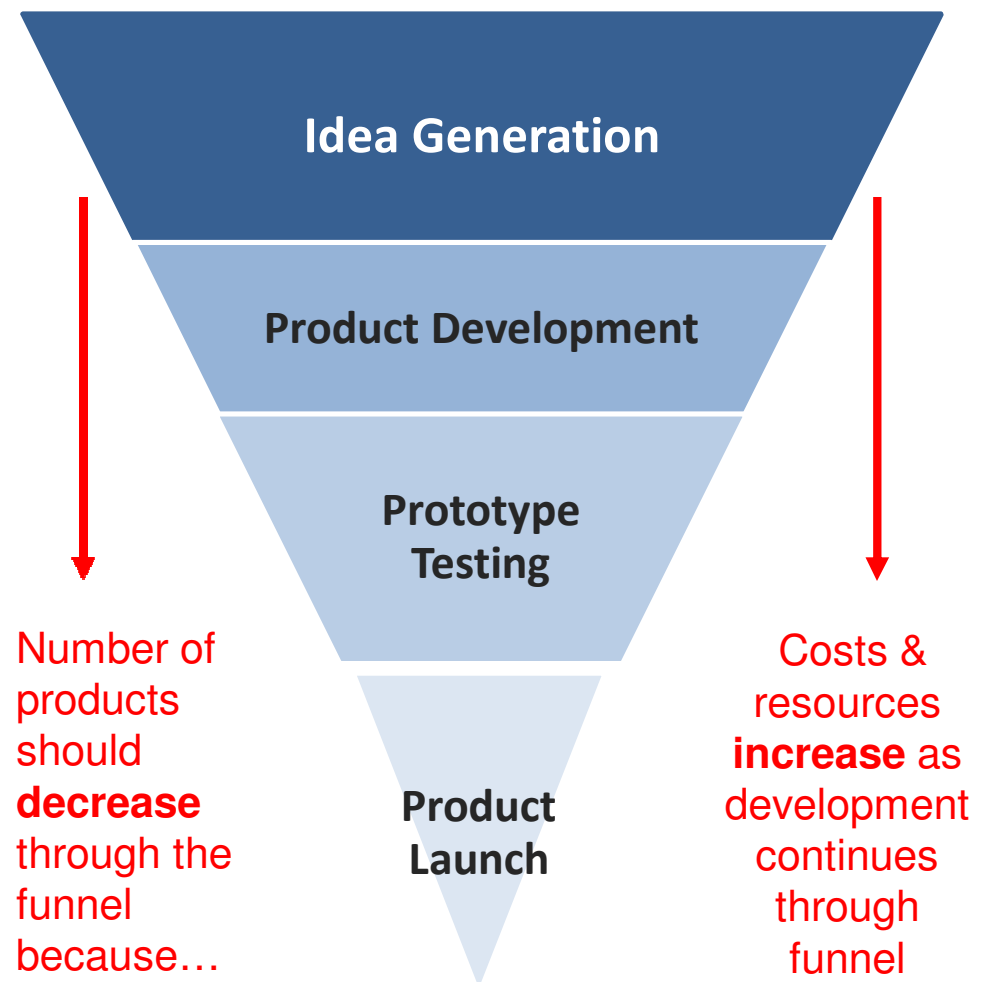
Things we need to know



New Product Development Funnel

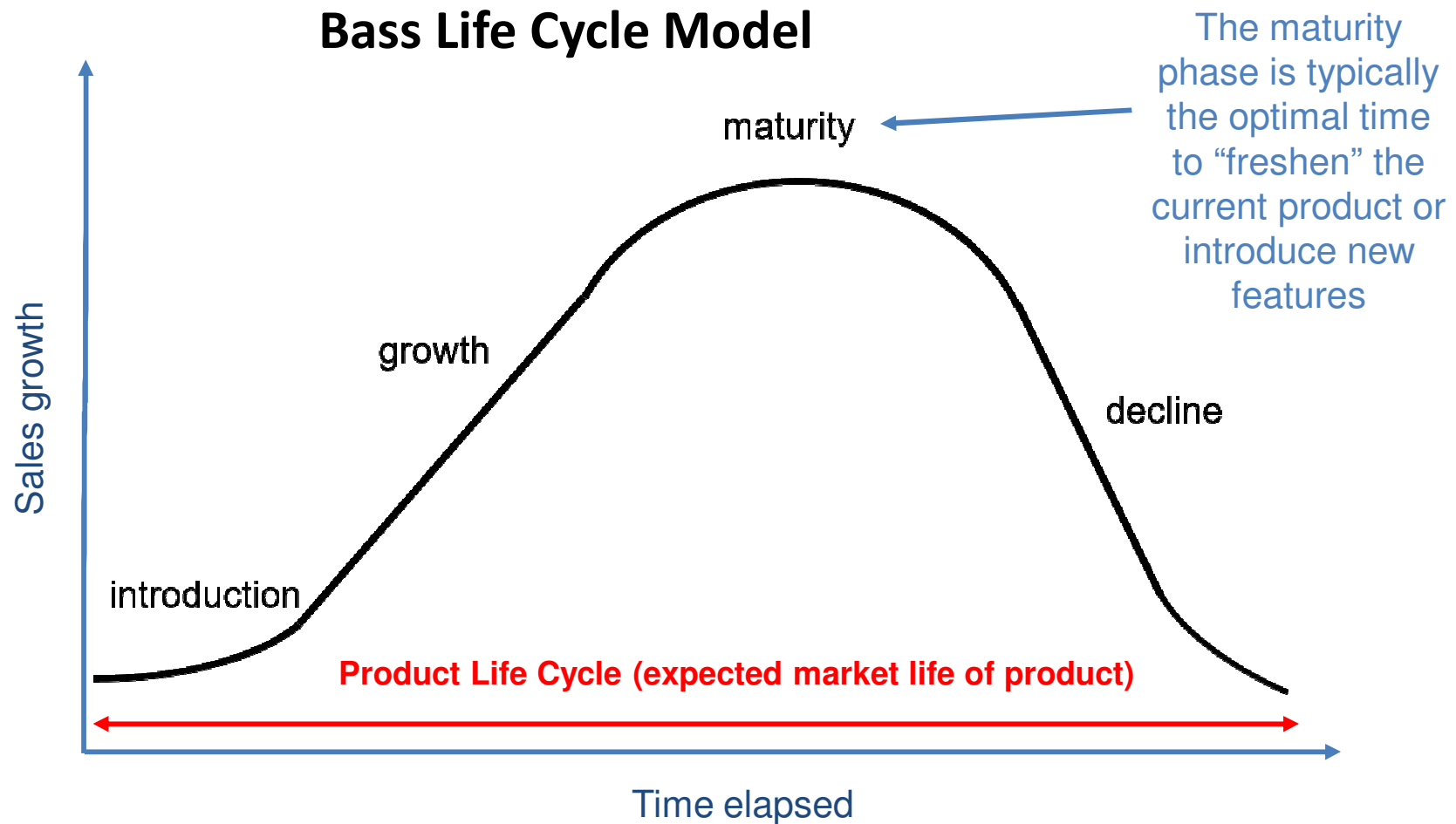
Things we need to know

1. *Many ideas considered in Fuzzy Front End (FFE) of Development*
2. *The Portfolio Management process evaluates ideas for potential ROI, feasibility, opportunities & support*
3. *Ideas become products in laboratory or product development phase*
4. *Lab & Plant produce prototypes for field testing*
5. *Successful field tests are scaled up for product launch and commercialization*



Product Life Cycle

Things we need to know



PDMA Organization —

- founded in 1976
- Focus on product development
- Began Identifying winners and losers of new product development (NPD)
- Benchmarked success/failure factors
- Refined 75 S/F factors into theoretical NPD best practices
- Took snapshot of industry NPD best practices in 1990, 2004, and 2012
- Discovered gap between academic and practitioner use of NPD-BP
- Global market and industries in BPS

NACM-BPS -

- Based on the PDMA-BPS (3)
- Focus on:
 - North America
 - Manufacturing
 - Chemical Industry
- Attempts to benchmark
 - NPD best practices
 - NPD success
 - NPD maturity for self assessment

Foundations: PDMA Best Practices Studies

Product Development Management Association (PDMA)

- Four PDMA BP Studies:
 - 1990, 2004, 2012, (2020 not complete)
- **22 years between first 3 BPS**
 - 1990-2012 fairly stable trends
- **59% overall success rate**
 - largely unchanged over time

Best vs Rest: Success Rates

PDMA NPD BPS-3 (2003)	The Best	The Rest
Percentage of Firms (category)	24%	76%
Successes	75.5%	53.8%
Successes-Profits	72.4%	47.9%
Sales from New Products	47.6%	21.4%
Profits from New Products	49.1%	21.2%
Number ideas for one success	4.0	9.2

Source: Trends and Drivers of Success in NPD Practices:
Results of the 2003 PDMA Best Practices Study (Barczak, Griffin, & Kahn, 2009)

Later, a Delphi method panel of experts grouped all the PDMA identified best practices into seven categories with % importance.

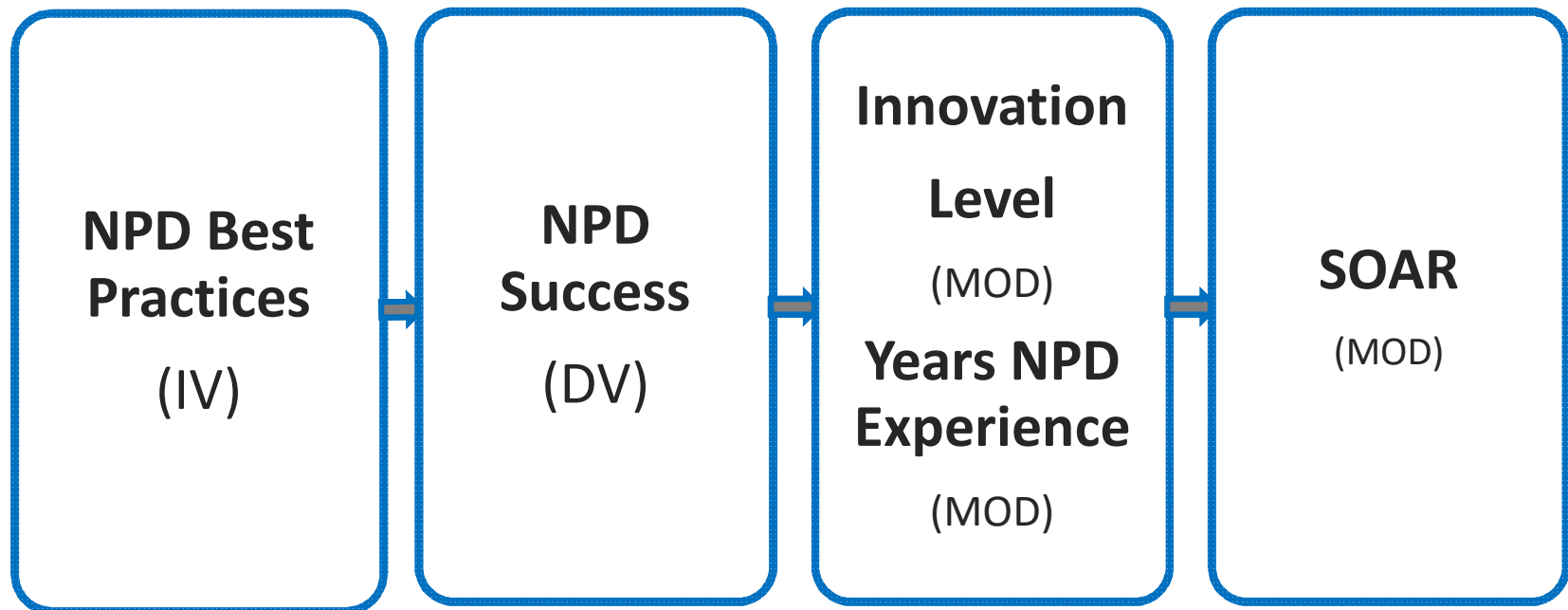
7D-NPD Best Practices

- Strategy 18%
- Research 16%
- Commercialization 15%
- Process 15%
- Project Climate 13%
- Company Culture 13%
- Metrics & Performance Measurement 10%

NACM-BPS Overview

Main Point: Can we observe and measure an effect between
NPD Best Practice and NPD Success?

Research in Innovation and New Product Development (NPD)



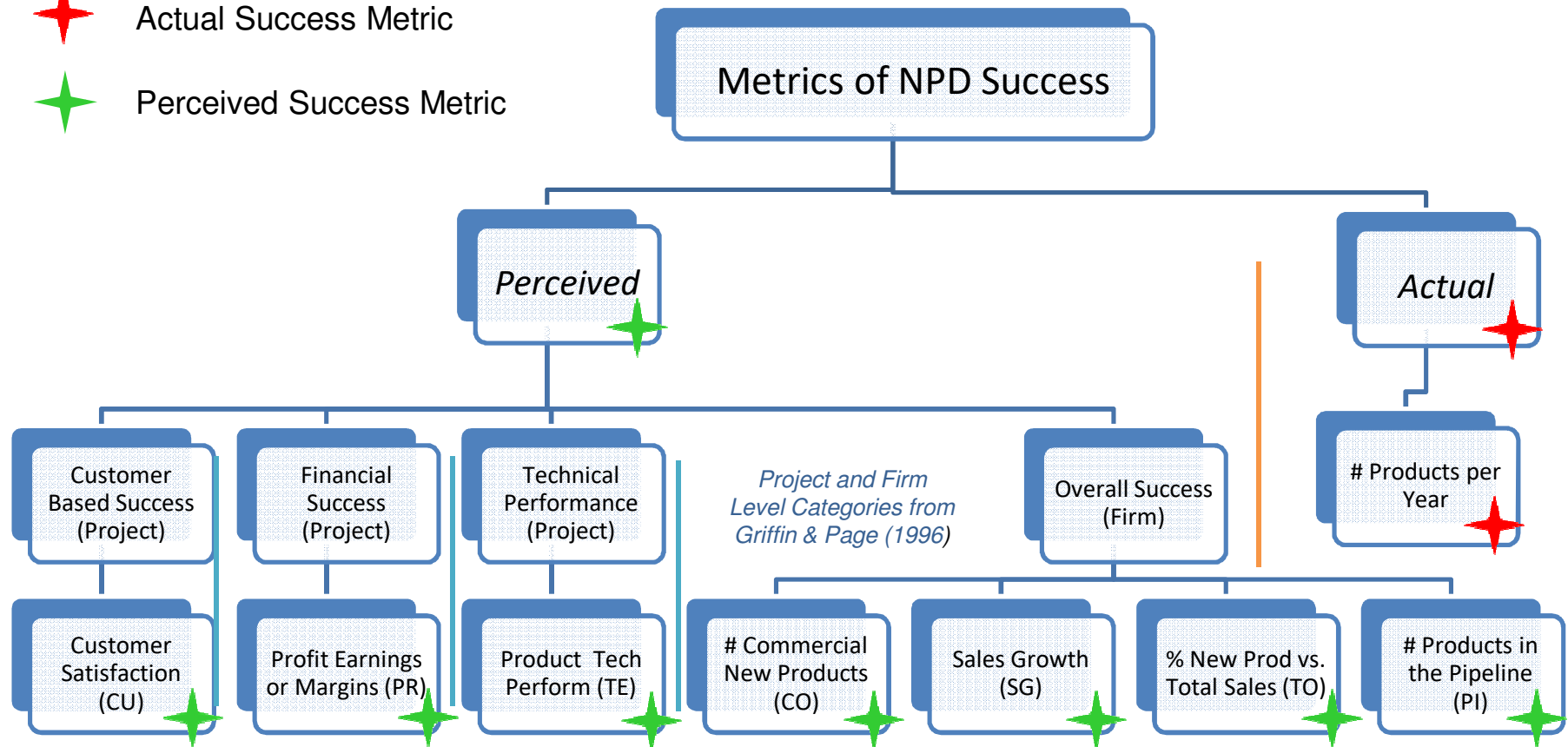
Metrics of NPD Success



Actual Success Metric



Perceived Success Metric

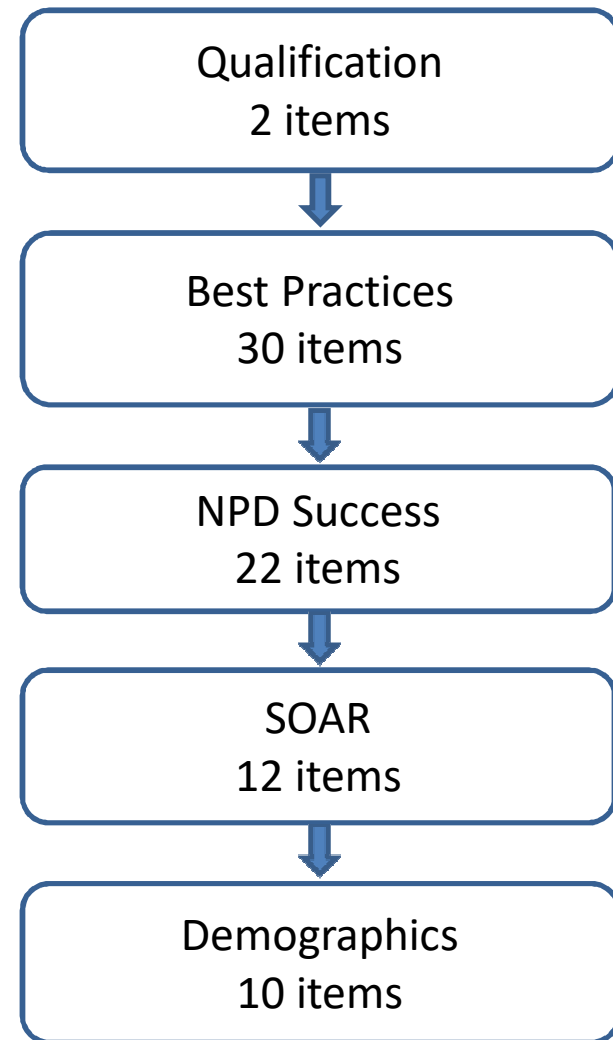
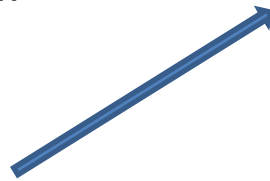


Hypotheses

- H1 – NPD best practices have a positive impact on NPD success.
- H2 – The level of innovation moderates the relationship between NPD best practices and NPD success.
- H3 – The amount of NPD work experience moderates the relationship between NPD best practices and NPD success.
- H4 – SOAR moderates the relationship between NPD best practices and NPD success.

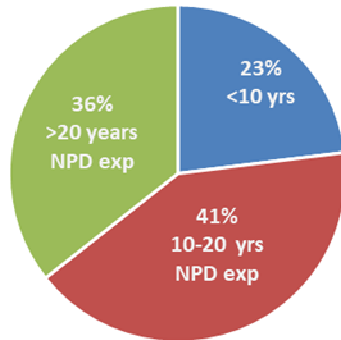
Methodology: Overview

- Quantitative Analysis
 - descriptive and inferential statistics
- Online survey instrument
 - Original questions (NPD Success)
(metrics identified by Griffin & Page, 1996)
 - Modified from 7-D NPD (to measure best practices)
(original by Barczak & Kahn, 2012)
 - SOAR framework
(Stavros & Cole, 2014)
- Target population: primarily North American commercial NPD practitioners (from PDMA, STLE, ILMA organizations)



Demographics:

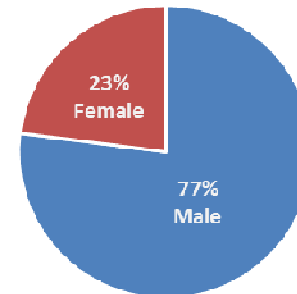
Years NPD Experience



Years NPD Experience	%
< 1 year*	0%
1-3 Years *	6%
4-9 Years *	17%
*<10 Years	23%
10-20 Years	41%
>20 years	36%
Total	100%

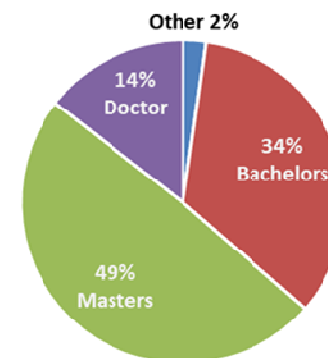
■ *<10 Years ■ 10-20 Years ■ >20 years

Demographics: Gender



■ Male ■ Female

Demographics: Education

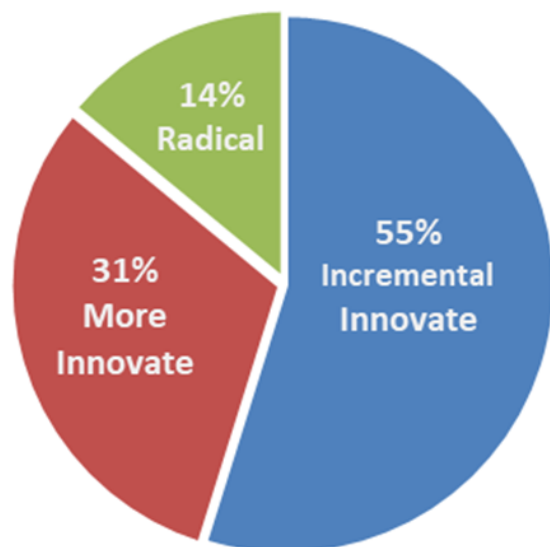


■ *All Other Training ■ Bachelors Degree ■ Master Degree ■ Doctoral Degree

- 3000+ invitations, 212 responses
- 83% completed the survey
- ¾ respondents were male
- 94% had 4+ years NPD experience
hard to make a comparison without NPD experience
- 98% had college degree and
- 63% have graduate degree (Masters & PhD)

Results: Innovation Strategy & Level

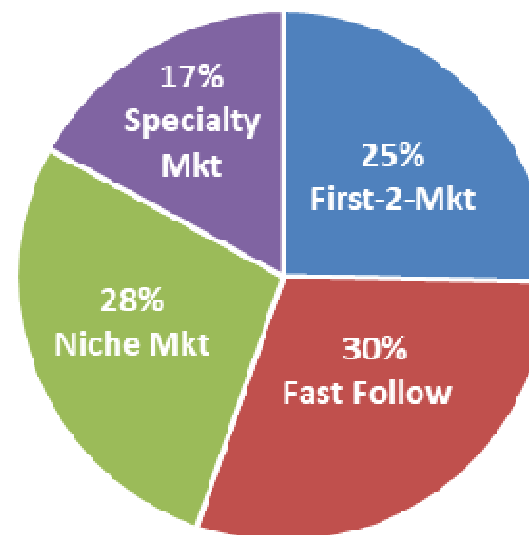
Level of Innovation



Level of Innovation	%
Incremental Innovation	55%
More Innovative	31%
Radical Innovation	14%
Total	100%

86% of innovation is incremental and innovative (not radical)

Innovation Strategy

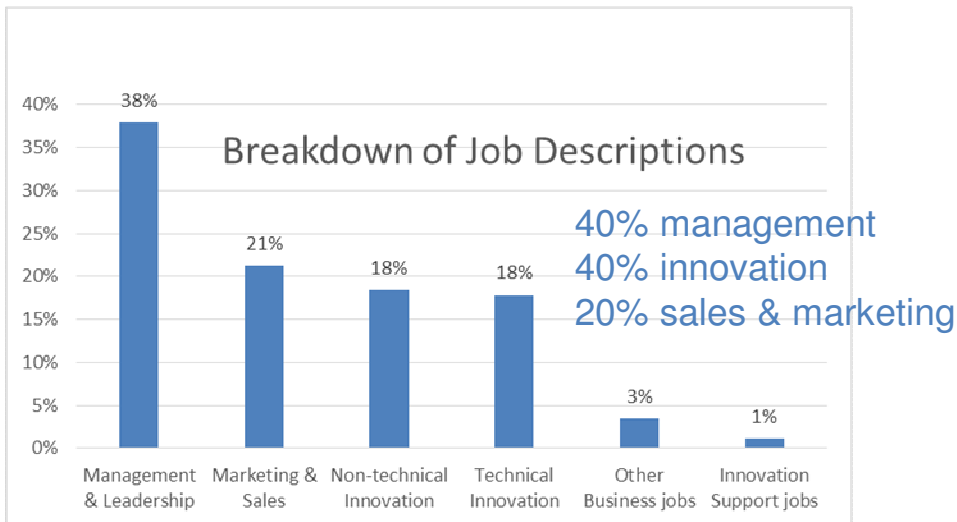
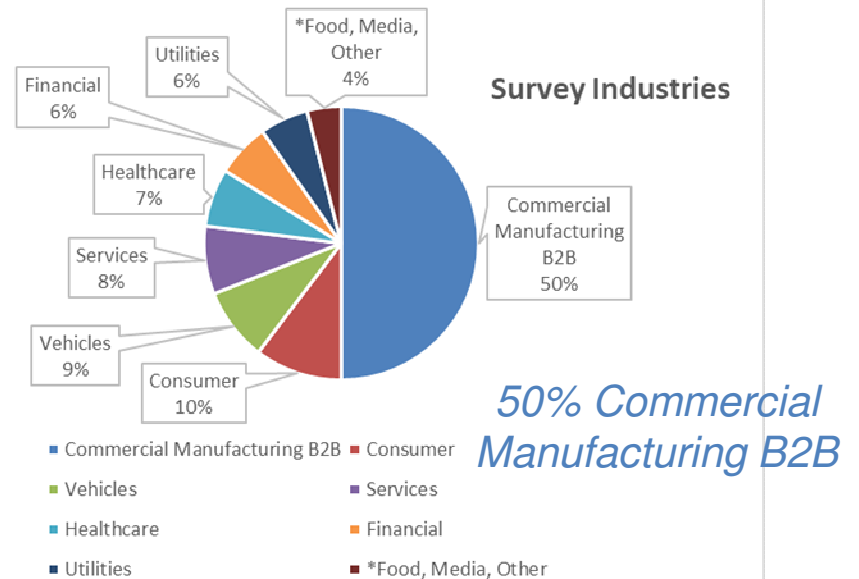
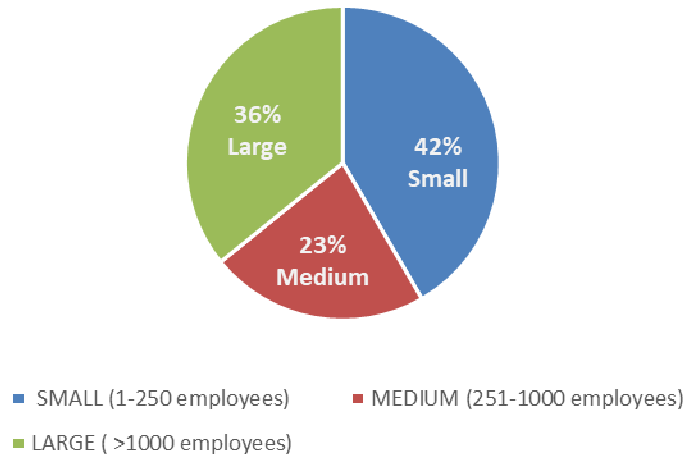


Innovation Strategy	%	n
First-to-Market 25%	25%	43
Fast Followers 30%	30%	51
Niche Market 28%	28%	47
Specialty Market 17%	17%	29
Total	100%	170

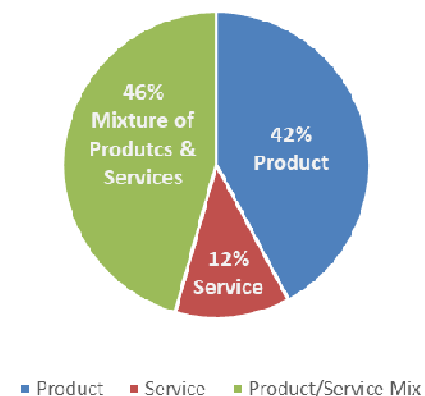
Response is fairly evenly divided between each of the four strategies

Company Demographics:

Company Size by Employees



Product, Service, or Mixture %



Hypotheses - results

H1 – NPD best practices have a positive impact on NPD success.

- There is a relationship between best practices and success.
- The relationship *works* with both composite and individual BP factors
- Data suggests 7D-NPD factors (NPD maturity score) can be used to predict NPD success.

H2 – The level of innovation moderates the relationship between NPD best practices and NPD success.

- With actual success, significant moderation was seen with radical innovation
- radical innovation is different and often operates outside normal innovation processes

H3 – The amount of NPD work experience moderates the relationship between NPD best practices and NPD success.

- The evidence does not support the hypothesis
- 94% of the survey respondents were experienced

H4 – SOAR moderates relationship between NPD best practices and NPD success.

- The evidence categorically supports the hypothesis
- suggesting change method(s) must be fully implemented & adopted in order to be truly effective.

Summary of NACM-BPS Research

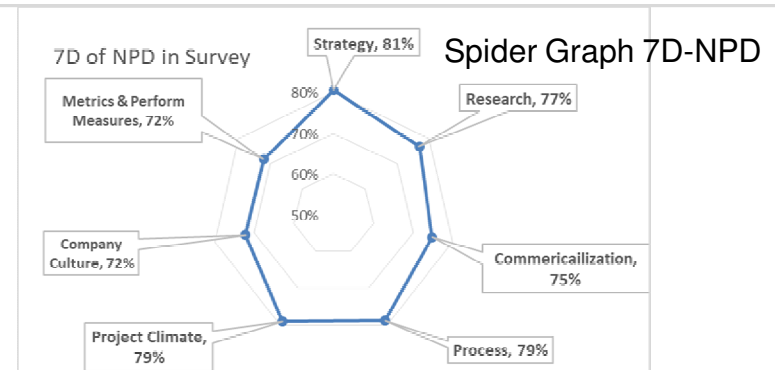
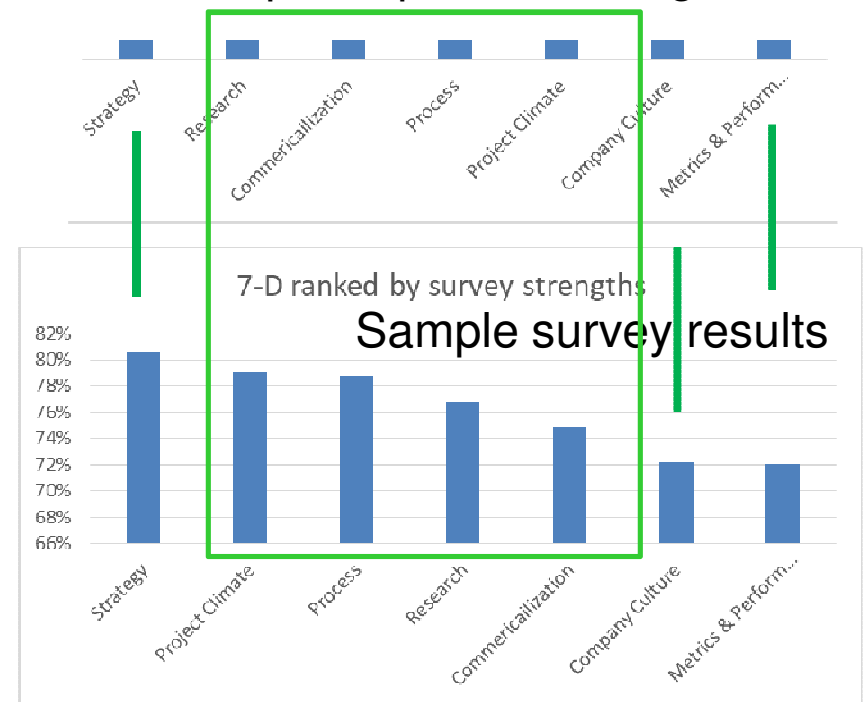
- The NACM-BPS survey measures the maturity of NPD best practices.
- Data suggests improving benchmark NPD maturity levels should also improve NPD performance.
- Companies preserve proprietary methods by using the survey tool internally, to optimize NPD best practices for success.
- Theory can best be testing by using the survey tool within a company; documenting “before” and “after” gains in NPD maturity.
- NACM-BPS research suggests other pathways exist to improve NPD success (i.e. SOAR, other change methods, and radical innovation).

How to use the NACM Survey Tool:

1. Take the NACM-BP survey (30 BP questions)
2. Report the results of BP Maturity Index as % out of 100% in each of the seven dimensions
3. Rank the scores from highest to lowest to determine strengths
4. Compare your strengths with the scores Delphi experts suggest as important?
5. Identify BP target dimensions (opportunities for improvement).
6. Compare examples for best/worst practices in your target dimension with company practices.
7. Consider revising and/or implementing to best practices for the target dimension in company.

NACM-BPS Survey - Average Scores	
Seven Dimensions of NPD-BP	%
Strategy	81%
Project Climate	79%
Process	79%
Research	77%
Commercialization	75%
Company Culture	72%
Metrics & Perform Measures	72%

Delphi Experts Ranking



All seven dimensions are fairly equal
(scale is important here)

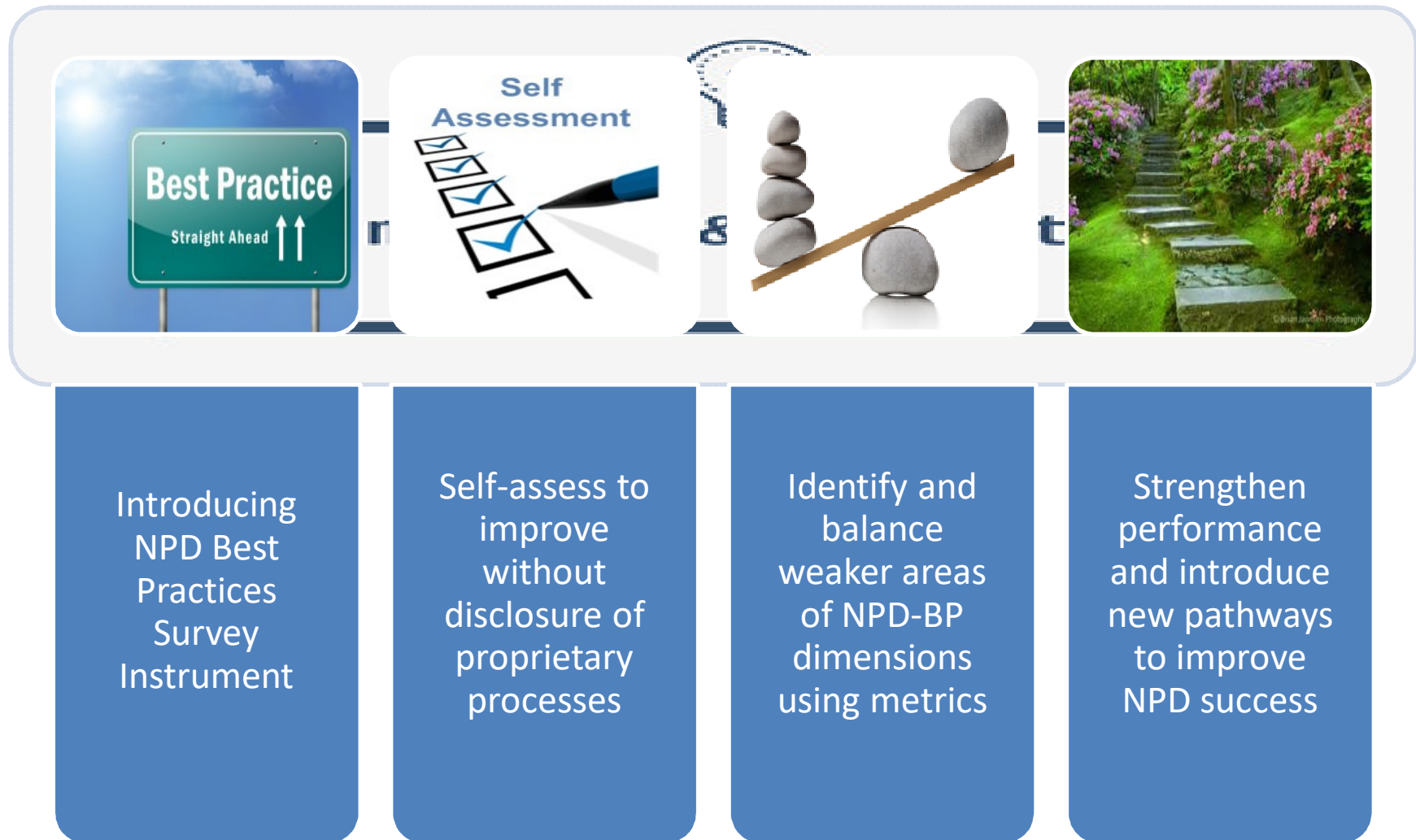
Best Practices: These is the key!



Dimensions of NPD Best Practices – taken from the Delphi method panel

Strategy 18%	Strategy - identification, prioritization, selection, and resource support of preferred projects.
Research 16%	Research - techniques to sense, learn, and understand customers, competitors, and forces in the marketplace.
Commercialization 15%	Commercialization - marketing, launch, and post-launch management of new products that stimulate customer adoption and market diffusion.
Process 15%	NPD Process - the implementation of product development stages and gates for moving products from concept to launch
Project Climate 13%	Project Climate - the means and ways to establish product development intra-company integration at the individual and team levels.
Company Culture 13%	Company Culture - the company management value system, including customers and suppliers.
Metrics Performance 10%	Metrics and Performance Measurement - measurement, tracking, and reporting of product development program performance.

Implications for Practice



Conclusion: Final Thoughts

Like the Mozart Dice Game, we presented a useful tool (the NACM-BPS survey)

A 100 question NPD-BP version is also available from *Business Horizons*

Both can help you easily evaluate your company's maturity level of NPD-BP

By benchmarking your companies maturity and
comparing the results with examples of best and poor practices,
you can see ways to improve your performance
and hopefully close the gap

Like the Dicer Game, it may not make you a maestro,
but it will give you a starting path to follow
and maybe teach you a few things along the road.

Conclusion: Acknowledgement

Thank you to:

the many NACM-BPS survey participants,
my family and friends for their support
Lawrence Tech University - COBIT
Dr. Matt Cole, Dr. Jackie Stavros, and Dr. Sri Raghavan

If interested in additional information, please contact me at
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Additional information available on my website at *appreciativeinnovation.org*
I will also post information on *STLE.org* (as permitted)

Special Thanks to Gloria Barczak & Ken Kahn for permission to modify their original survey.
“Identifying New Product Development Best Practice.”
by: Barczak, G., & Kahn, K.B. (2012). *Business Horizons*, 55(3), 293-305.