

Targeting Project Outcomes with Selected PD Enabling Factors

Researchers: Victor Tang, Bing Liu

Advisors: Kevin Otto PhD, Prof. Warren P. Seering

Definition

fac·tor (fāk'tər), *n.* **1.** one of the elements that contribute to bring about a given result. **2. PD.** A capability that enables an organization to improve a specific project outcome: *vicarious learning is a factor that accelerates intellectual capital formation.*
– **Ant.** *fad, buzzword, superstition.*

With apologies to American College Dictionary.

Literature reports a vast number of factors

Authors		Publication	Key findings	# of factors
V. Krishnan, K.Ulrich	research	PD Decisions: A Review of the Literature	Product development in the perspective of decision making. Comprehensive review of the literature.	65
M. McGrath	industry	Setting the PACE in PD	A proprietary PD model: includes decision making, technology management, pipeline management, etc.	54
S.Brown, K.Eisenhardt	research	PD: Past Research, Present Findings, and future Directions	PD as rational plan, communication web, disciplined problem solving. Comprehensive literature review.	98
Malcolm Baldrige National Quality Awards	NIST	Malcolm Baldrige National Quality Awards Criteria.	A "comprehensive" assessment tool to address business process effectiveness from a business and quality management perspective.	86
PDMA	industry	PDMA Handbook	Phased based PD. Performance is based on program profitability and program impact.	49
U. of Cambridge	research	Speeding New Products to Market	A framework for new product development process improvement, considers supply chain.	135
MIT LAI Center	research & industry	Lean Aerospace Initiative MIT	Lean enterprise principles, value creation, pull, eliminate waste.	56
Arthur Andersen	industry	Global Best Practices	Proprietary benchmarking tools that cover 10 majors areas of product development.	201
K.Otto	industry & research	PERFORM Process Assessment Product Genesis Inc.	Malcolm Baldrige based, seven-category project management assessment tool. Considers platform and product complexity issues.	76
R. Cooper, E. Kleinschmidt	research	Benchmarking the Firm's Critical Success Factors in New Product Development	Overall new product performance is measured in the dimensions of program profitability and program impact.	43
CMU SEI	research	Capability Maturity Model Integration (CMMI) V 1.1	Reference model of mature practices in a specific discipline, assesses a group's capability to perform discipline.	78
P. Chiesa, P. Coughlan, C.Voss	research	Development of a Technical Innovation Audit	Auditing framework for technical innovation management. Four core processes: concept generation, PD, process innovation, and technology acquisition.	45
Xerox	industry	Xerox Engineering Excellence Process Strategy	A matrix based model to assess product development process	120



total 352

Definition

targeting (tärgit' ĩn), *n. gerund.* **1. PD.** Act of aiming, or directing, a factor toward a specific project outcome. : *targeting accuracy of requirements in order to eliminate rework.*
– **Ant.** *ready, fire, aim.*

With apologies to American College Dictionary.

Research Question

What enabling factors are the most *significant* predictors of specific PD performance output metrics?

- profit
- market share
- product quality
- customer satisfaction
- organizational effectiveness

Survey

- 352 process elements reduced to 140
- MIT CIPD/ILP Conference October 2002
86 surveys, 83 valid responses

Industry

Auto	17.6 %
Electronics	15.3
Manufacturing	14.1
IT software	8.2
Biotech/medical	7.1
Defense	5.9
Aero	4.7
Heavy metal	4.7
Food/agriculture	3.5
Finance/banking	2.4
Other	16.4

Employees

> 2500	62.7 %
500-1500	19.3
<500	18.0

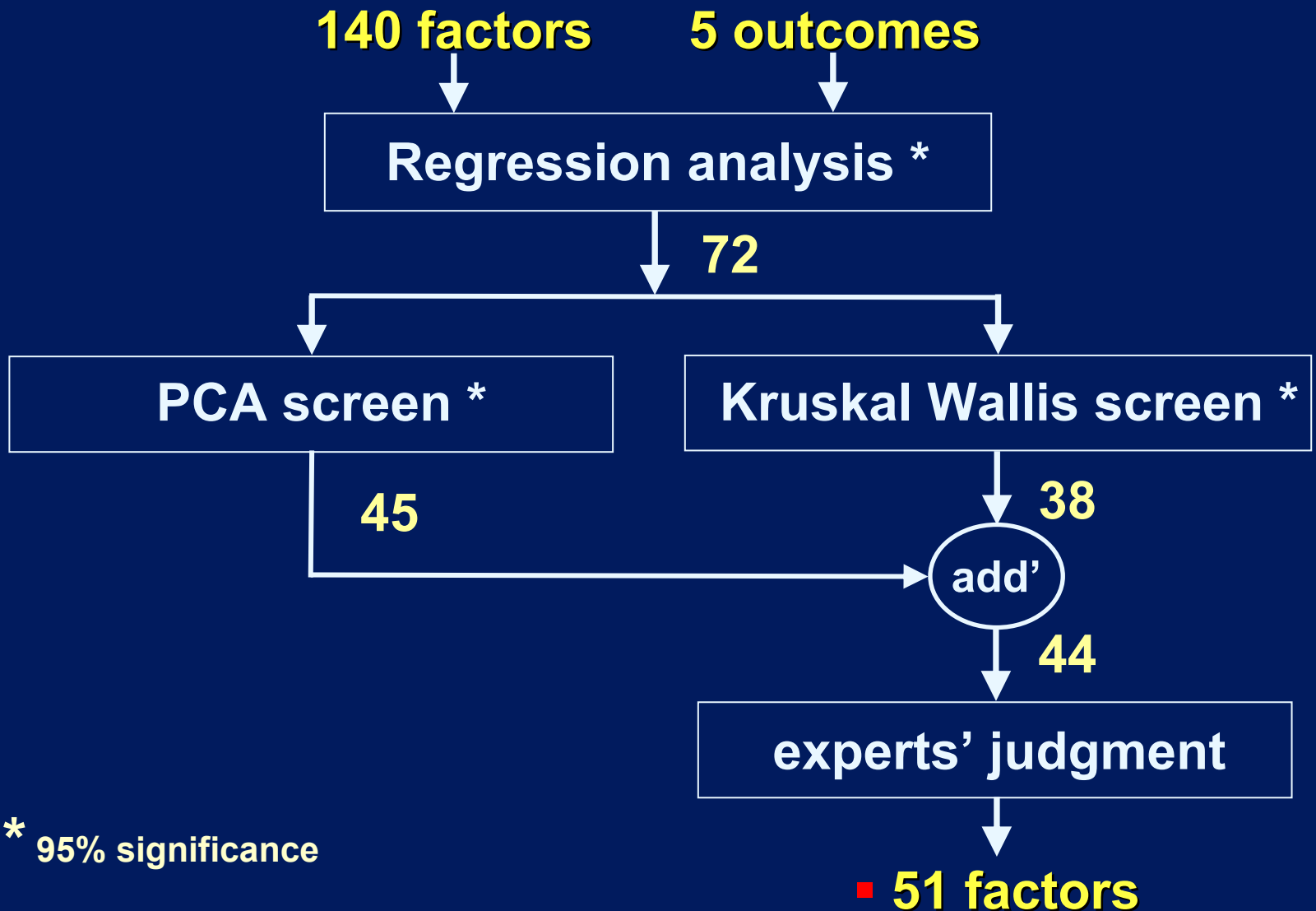
Experience (years)

High	37.5
Low	2.5
Mean	19.6
SD	8.52

Survey sample questions

	How important is each to achieving success in product development?							How capable is your company at each?						
	Not Important		Somewhat important		Very important		Extremely important	Not capable		Somewhat capable		Very capable		Extremely capable
1. Establishing core concept of product	1	2	3	4	5	6	7	1	2	3	4	5	6	7
2. Market positioning of the product	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3. Selecting the product architecture	1	2	3	4	5	6	7	1	2	3	4	5	6	7
4. Setting priority among product reqts	1	2	3	4	5	6	7	1	2	3	4	5	6	7

Screening for significant factors



* 95% significance

Market share factors

Factors	%	outcomes					Importance		Capability	
		P	M	Q	C	O	top10	last10	top10	last10
Strategic intent	99.9		☐	☐		☐				
Manage cultural change	99.2		☐	☐		☐				
Transition to sales	98.7	☐	☐		☐					
Partner sat. and loyalty	97.5		☐							
Market positioning	96.8		☐			☐				
Services processes	96.3		☐		☐					
Financial goals	96.2		☐							
Make-buy decisions	99.7	☐	☐					☐		
Product pricing strategy	99.2		☐							
Customer sat. data	97.9		☐		☐					
Formal supplier ties	97.4		☐							☐
Teamwork culture	96.4		☐				☐			
Competitive environ.	96.2		☐				☐		☐	
Functional content	96.0		☐		☐				☐	

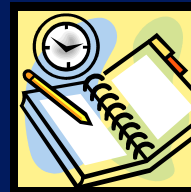
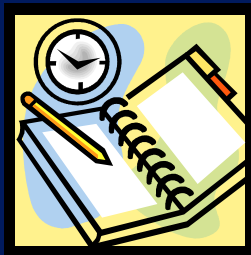
Construction of assessment tool

- 140 factors
- KJ exercise



8 groups 51 factors

assessment tool
construction



questions

Leadership	3
Organizational Culture	9
Human Resources	4
Information	7
Product Strategy	13
Project Execution	11
Product Delivery	4
Results	23

Example questions

1.2 Project leader's experience.

Experience limited to narrow product issues, weak in other areas. Needs help and rework very frequently.

Experienced in many of the technical issues, requires some direction on business, financial and customer issues. Needs help occasionally.

Has managed technical, business, financial and customer issues. Does not need help.

Has track record of delivering complex technical projects, business, financial, and customer issues. Her advice is frequently sought after.

----->1 -----> 2. -----> 3 -----> ... -> 4...-----> 5 ----->-> 6... -----> 7 -----

7.2 Transition to Sales. Is the product ready for sales?

Sales organization develops sales plans when PD "releases" to sales. Readiness takes great effort. Sales presence is largely absent during PD cycle except when product is tossed "over the wall."

Sales participates in all key review checkpoints during PD. Sales has reviewed and critiqued the product specs and prototypes during PD.

Product validated with lead users and beta customers with sales groups as full-fledged team members. Sales is confident of the product and its ability to perform in customer environment.

Product readiness is a non-issue. Sales has been a co-developer from the concept development stage. Product issues from sales are resolved as they arise throughout development.

----->1 ----- ... -> 2 ... -----> 3 -----> ...-> 4 ... -----> 5 -----> ...-> 6 ...-----> 7 -----

Summary

On a journey to enhance organizational capabilities and project outcomes.

- **Surveyed PD organizations to identify the most significant predictors of successful PD outcomes.**
 - **Developed a PD capabilities assessment tool to help direct improvements to specific outcomes.**
 - **Initiated test and validations for program level activities.**
- └ **Plan to continue to refine assessment tool and enhance its predictive power.**