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Lecture series under the auspices of STU rector



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“Community Based Innovation and Cross Industry Technology Acceptance: Market Entry for High Tech Innovation in B2B Markets”

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**Visiting Professors' College at STU
SLOVAK UNIVERSITY OF TECHNOLOGY**

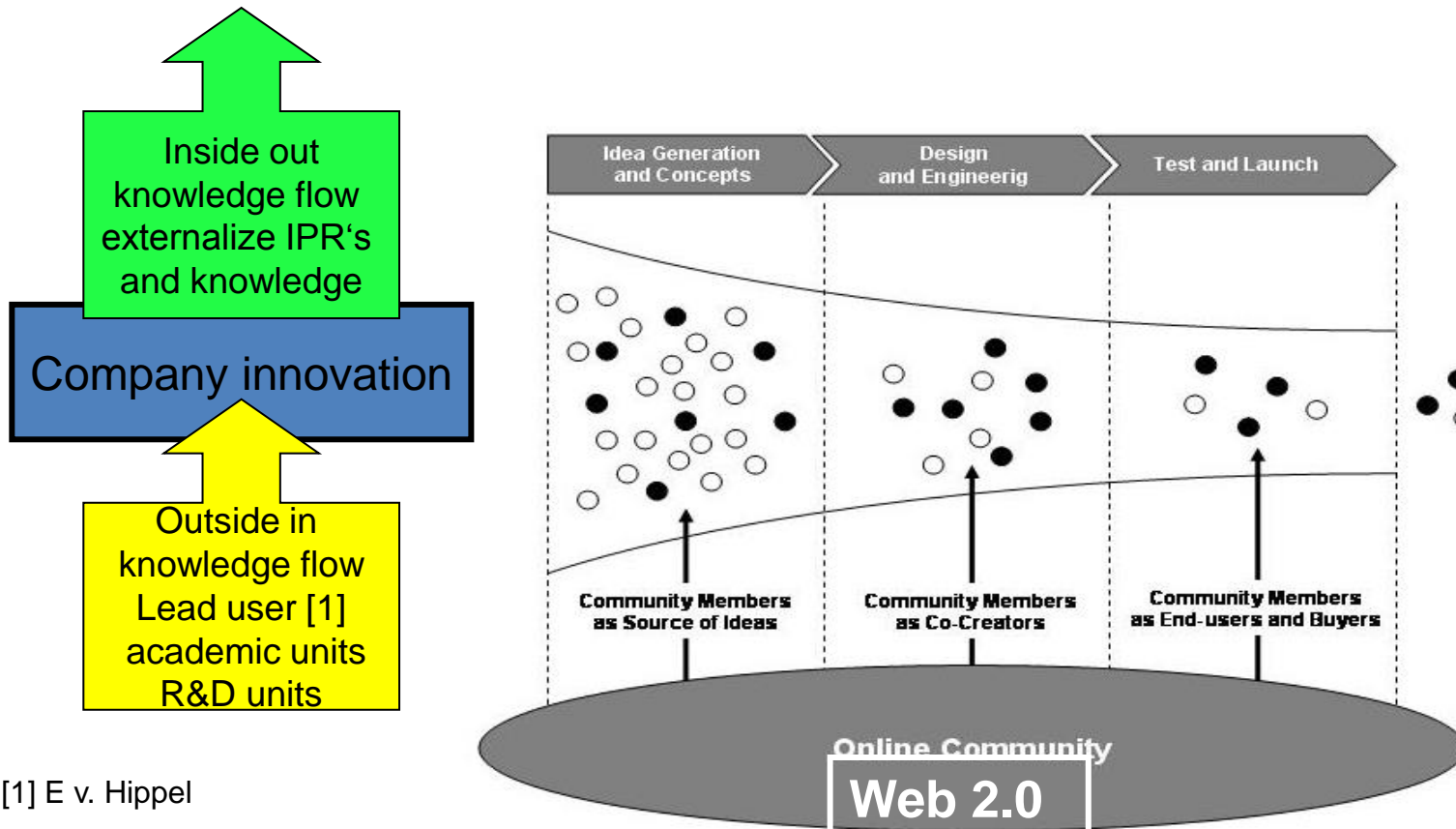
AGENDA

1. **Open Innovation (OI) / Community Based Innovation (CBI) (#2)**
2. **Market Entry and Window of Opportunity (#2)**
3. **Innovation: Readiness and Resistance (#3)**
4. **Cross Industry Technology Acceptance and marketability (CITA) (#5)**
5. **High-Tech Innovation: Market Entry(#5)**
6. **Marketing Management for High Tech Products (#2)**
7. **Marketing Testbed (#3)**
8. **Summary (#1)**
9. **References (#2)**

1.1. Open Innovation (OI) / Community Based Innovation (CBI)

- **Open Innovation** has an increasing effect on a firm's innovative behavior.
Open innovation helps to reduce the risk of technology rejection as well as the risk of enlarged assimilation gap.
- **Community Based Innovation (CBI)** is a special form of a social network with specific tasks supporting the product innovation process.
- **Cross industry technology acceptance (CITA)** in open innovation regimes requires the introduction of evolutionary economy concepts.
- **CITA** comprises the Technology Acceptance by different industries, driven by similarity of Perceived Usefulness and Perceived Ease of Use and fulfilling similar marketability requirements.

1.2. Community Based Innovation (CBI)



[1] E v. Hippel

[15] Füller et al.p.4] Multistage CBI Process with online Community



2. Market Entry and Window of Opportunity (1/2)

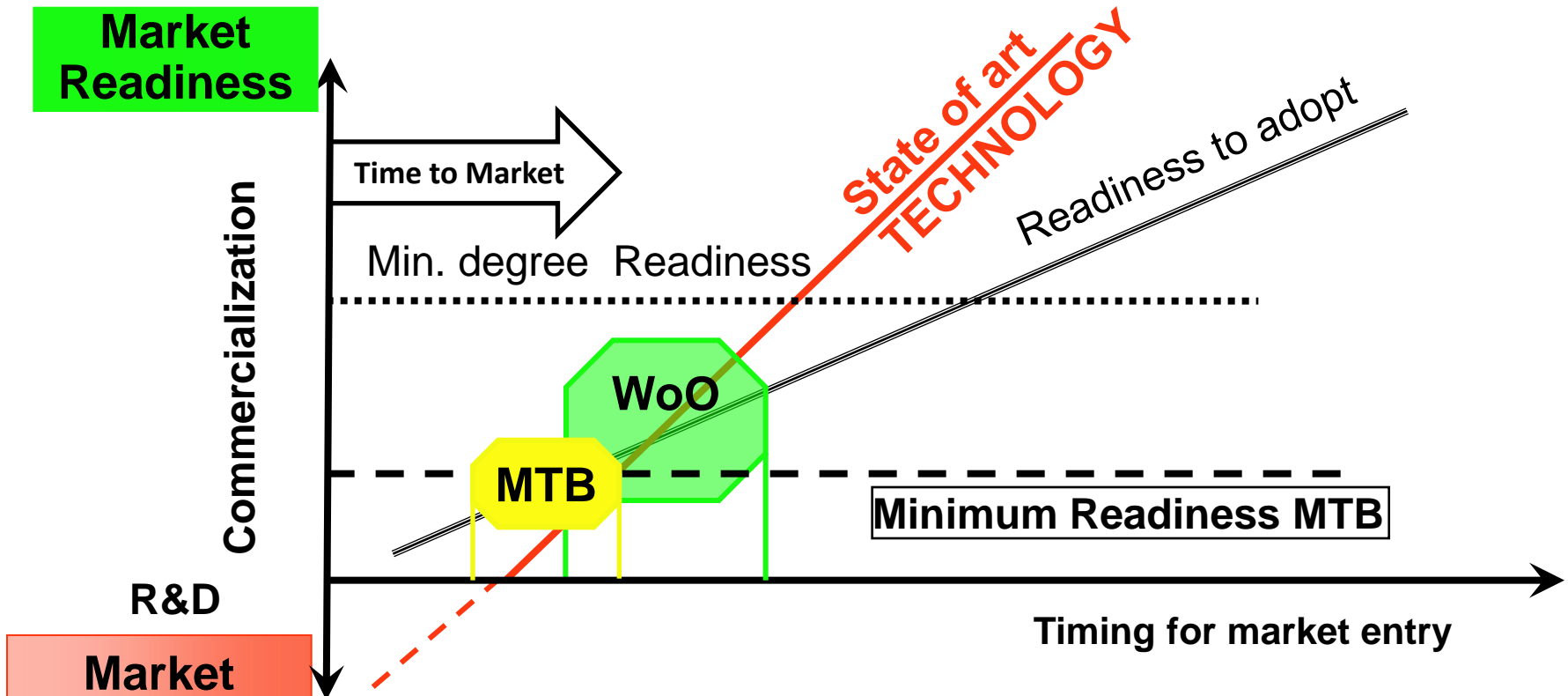
High Tech Innovation in B2B¹⁾ Markets

- **How** to select the target market?
- **When** to enter in **which** target market?
- **Why** should target customer buy?
- **How much** is he/she willing to pay?

Commercialization is the transformation via **Market Entry** of a (scientific) **invention into** a sustainable, competitive and profitable **innovation**.

¹⁾ B2B = Business to Business

2.1. Market Entry & Window of Opportunity¹⁾ (2/2)



WoO : Window of Opportunity (¹[4] G. Day & J. Freeman) ₇

MTB : Marketing TestBed

3. Innovation: Market Readiness and Resistance (1/4)

Customers' aspect:

- Readiness to innovate is an entrepreneurial and behavioral feature to acquire and to use an offered innovation in the market. (**MAKE or BUY ?**)
- Resistance to innovate is an entrepreneurial and behavioral feature to reject the offered innovation.
- Q: Do the communicated innovative features meet customer's demand for problem solution?

Stages of resistance: [5],

- Immediate rejection
- After test: negative acceptance: resistance to adopt the innovation
- After Adoption (purchase, lease, rent etc.): negative **Assimilation** („assimilation gap“ see: [7] Fichman & Kemmerer) => implicit or explicit rejection
- **Resistance depends on (degree of) nonfulfillment of marketability criteria.**
- Besides general criteria of technology acceptance each industry's resistance profile shows specific requirements to be met to a certain degree.

Examples: phase change material technology, Vanadium Redox storage technology

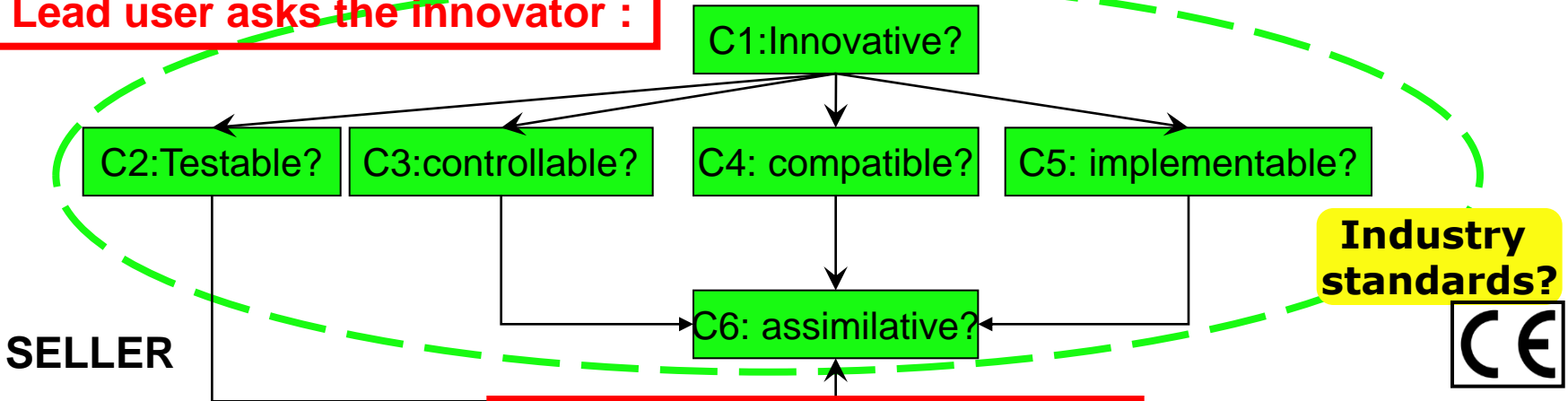
Readiness & Resistance: Marketability Criteria C1 to C6 (2/4)

- C1. Innovativeness** is the subjective degree of newness of a product, ranging from gradual over incremental to radical innovative.
- C2. Testability** is the ability of the innovation to be tested with reproducible results. Testability requires observability.
- C3. Controllability** is the ability of the innovation to stabilize the system against external/internal errors or perturbations by using feedback loops.
- C4. Compatibility** is the ability of the innovation to mutually interface and operate with non-innovative systems already in use.
- C5. Implementability** is the ability of the innovation to be properly built in, set up and run in an existing operating system.
- C6. Assimilability** is the ability of the innovation to accommodate / assimilate to the system's organization where the innovation is used.

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3.2. Innovation: Readiness and Resistance (3/4)

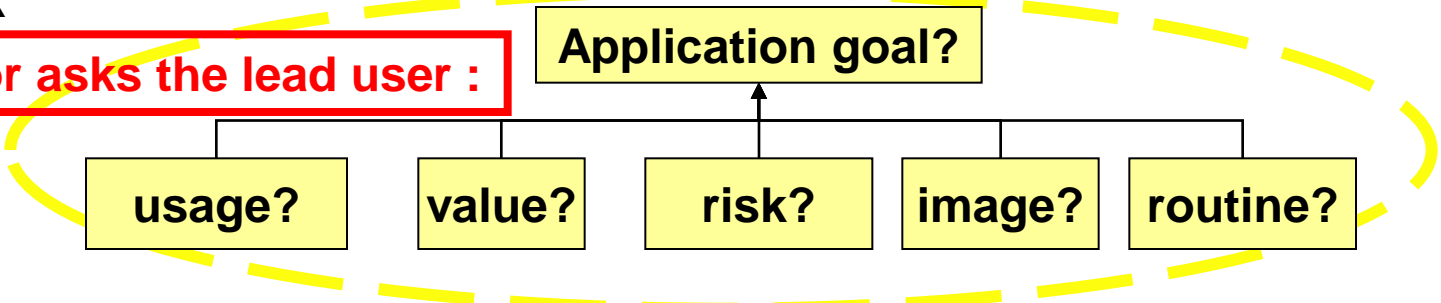
Lead user asks the innovator :



Acceptance => Adoption => Assimilation / Rejection

BUYER

Innovator asks the lead user :



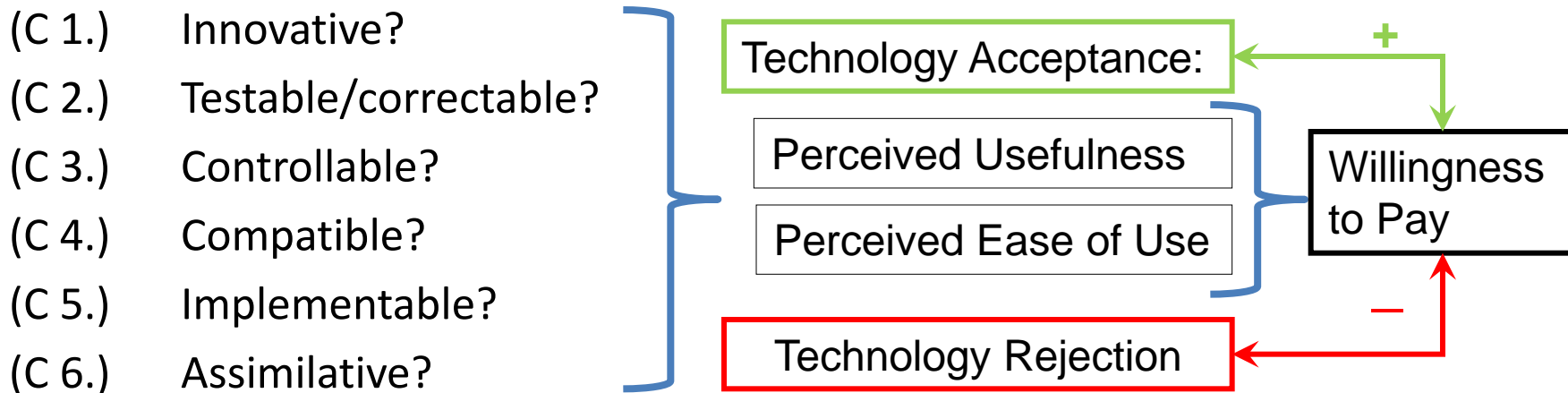
3.2 . Innovation: Readiness and Resistance (4/4)

Fictitious Example		perceived occurrence of: Innovation Obstacles					
		Marketability Criteria C1 to C6					
Innovation		TEST- ABLE	CONTROLL ABLE	INNOVA- TIVE	COMPA- TIBLE	IMPLEMEN -TABLE	ASSIMIL- ATIVE
low -1 high +1 Doubtful ? Influence on expected benefit	USAGE	+1	0,3	?	+1	+1	+1
	VALUE	?	?	+1	?	?	+1
	RISK	+1	+1	+1	0	-0,5	0
	IMAGE	-1	-1	?	?	?	+1
	ROUTINE	?	?	-1	+1	+1	+1

Methods: Problem Centered Interview (PCI)[8],
Analytical Hierarchy Process (AHP) [9]
MCDM (Multi Criteria Decision Making) [10] esp. in B2B markets

4. Cross Technology Acceptance and Marketability (1/5)

Criteria 1 to 6 of High-Tech Innovation Marketability

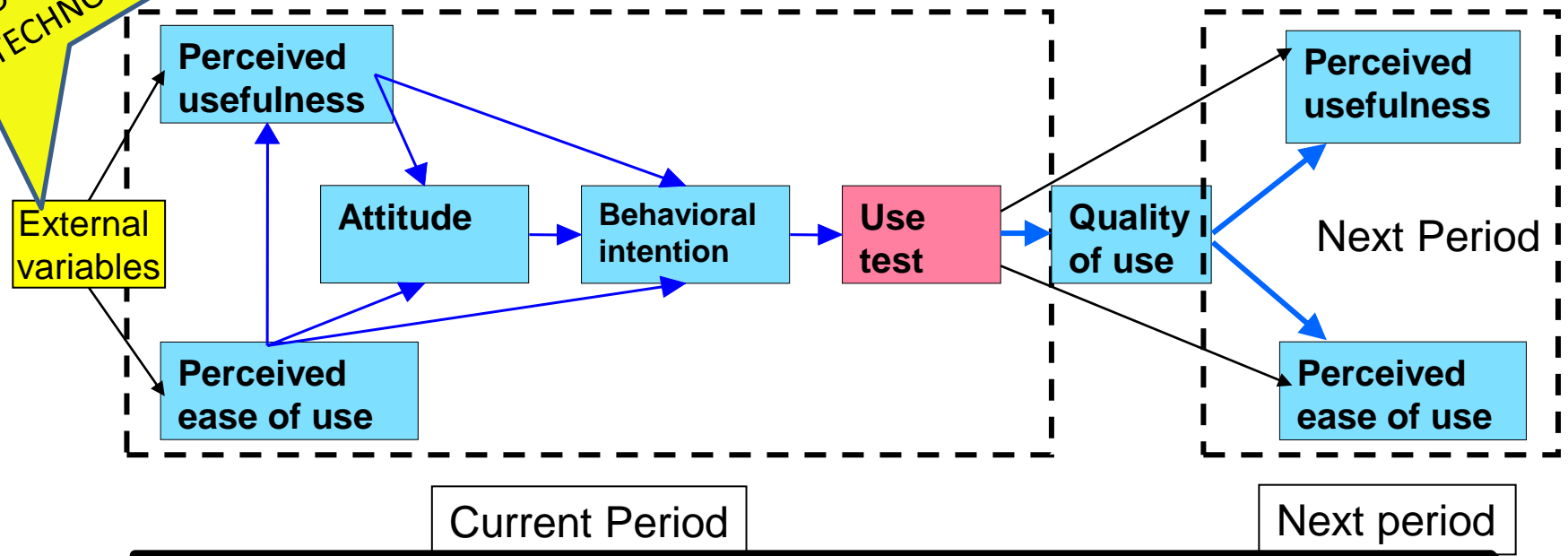


- Cross-functionality is a proven economic success factor in high-tech innovation and implies communication between multiple knowledge disciplines
- The buying / selling center is represented by a multidisciplinary buying / selling team
- Decision requires multidisciplinary communication skills [16]

4.1. Technology Acceptance (2/5)

GLOBAL TRENDS IN SOCIETY AND TECHNOLOGY

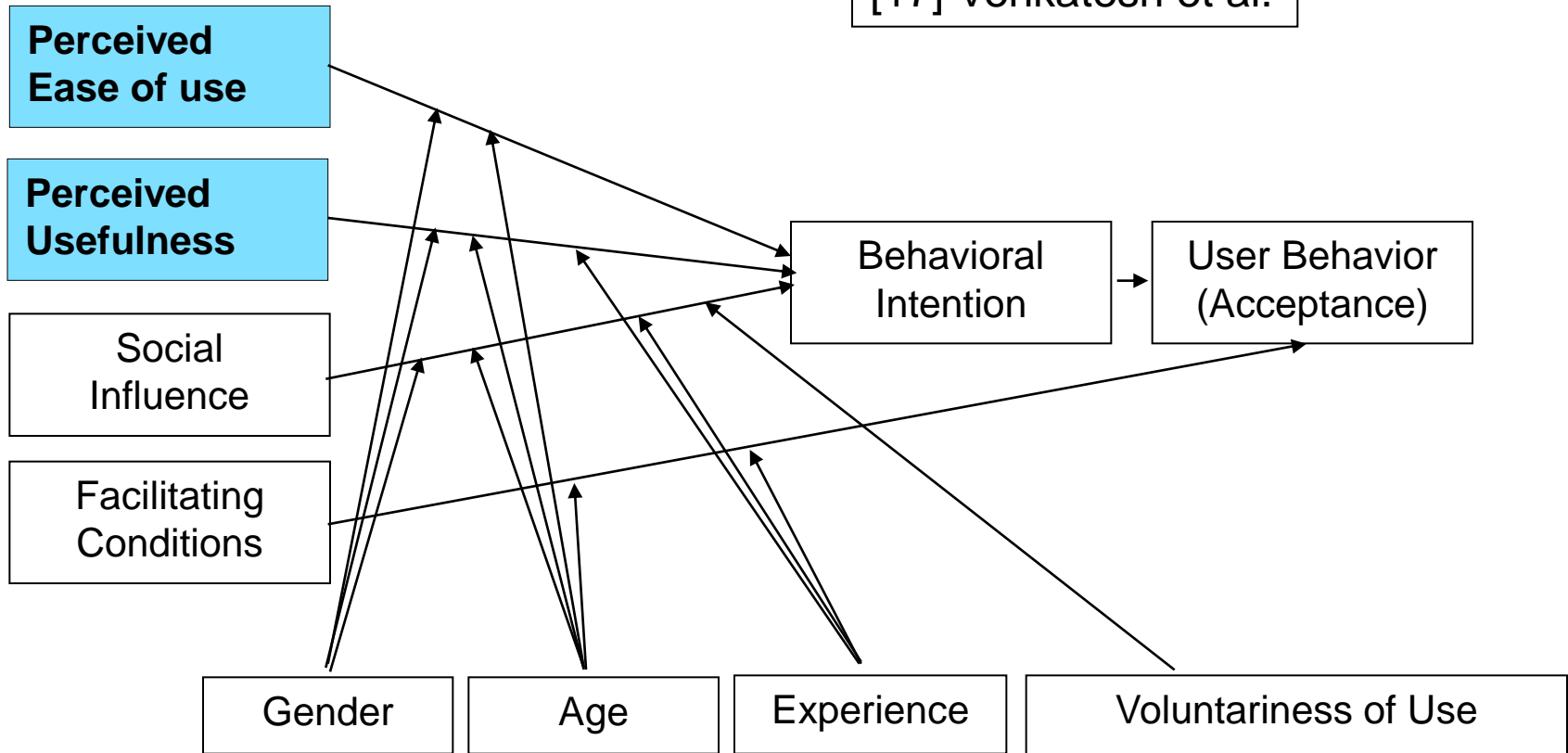
TAM – Structural Equation Model ([6] Davis, 1989, Morris, u.a.m.)



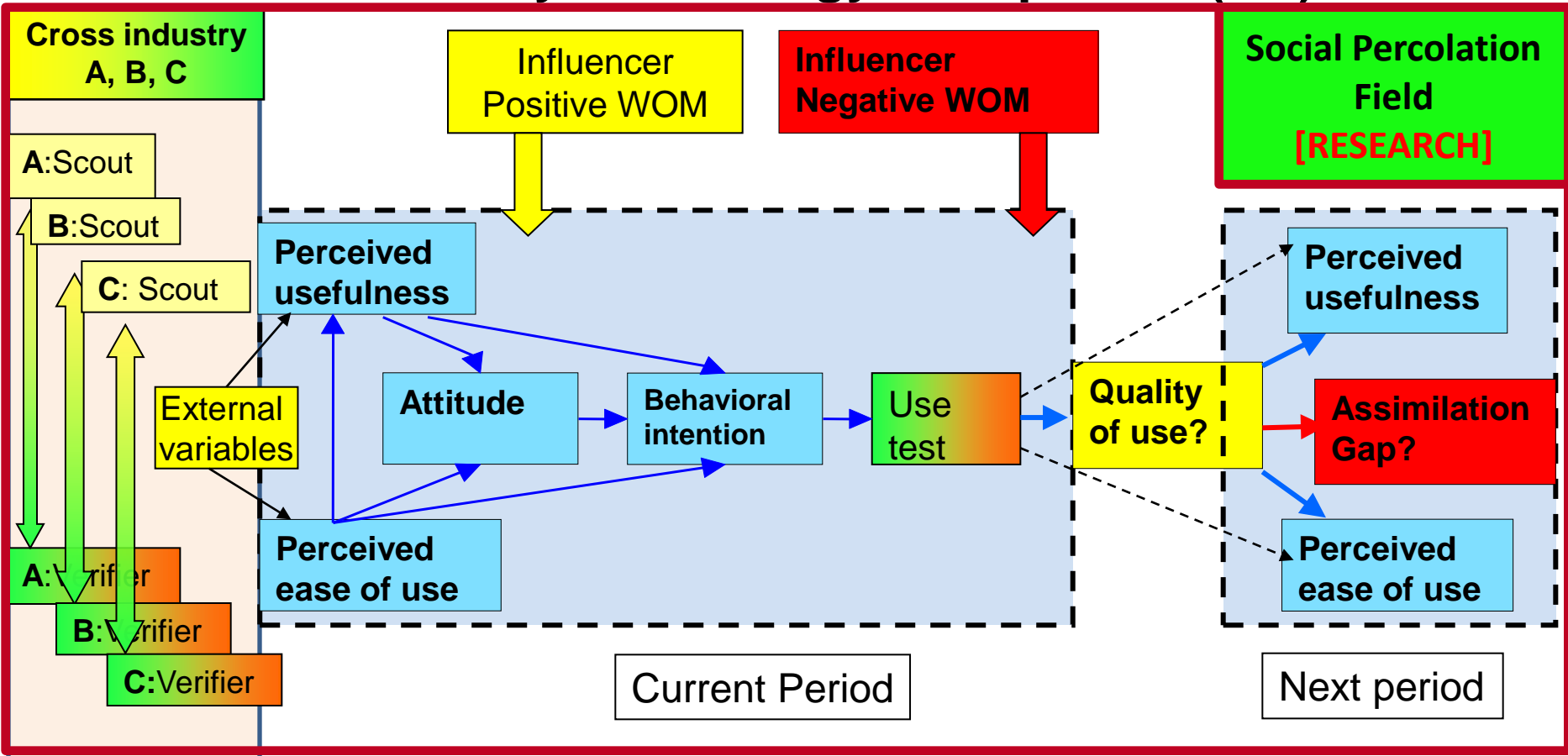
MARKETING TESTBED

4.1. Technology Acceptance (3/5)

[17] Venkatesh et al.



4.2. Cross Industry Technology Acceptance (4/5)



4.3. Cross Industry Technology Acceptance (5/5)

Criteria	Lead User Roles in A,B,C		Cross industry Technology Similarity (example PCM: in Textile , Glass , Gypsum plasterboard)			
	I: Scout	II: Verifier	Perceived fulfillment of Criteria:	Textile fabrics A	Glass Façade B	Gypsum Boards C
Expected benefit	Strong	Weak	C1: Innovative?	high	high	high
			C2: Testable?	easy	yes	yes
Perceived Usefulness	Weak	Strong	C3: Controllable?	unclear	unclear	yes
			C4: Compatible to Standards?	Yes	Yes	Yes partially
			C5: Implementable?	Yes	Yes	yes
Opinion leadership	Medium high	Medium / low	C6: Assimilative?	unclear	TCO?(total Cost of Ownership)	

5. High-Tech Innovation: Market Entry (1/5)

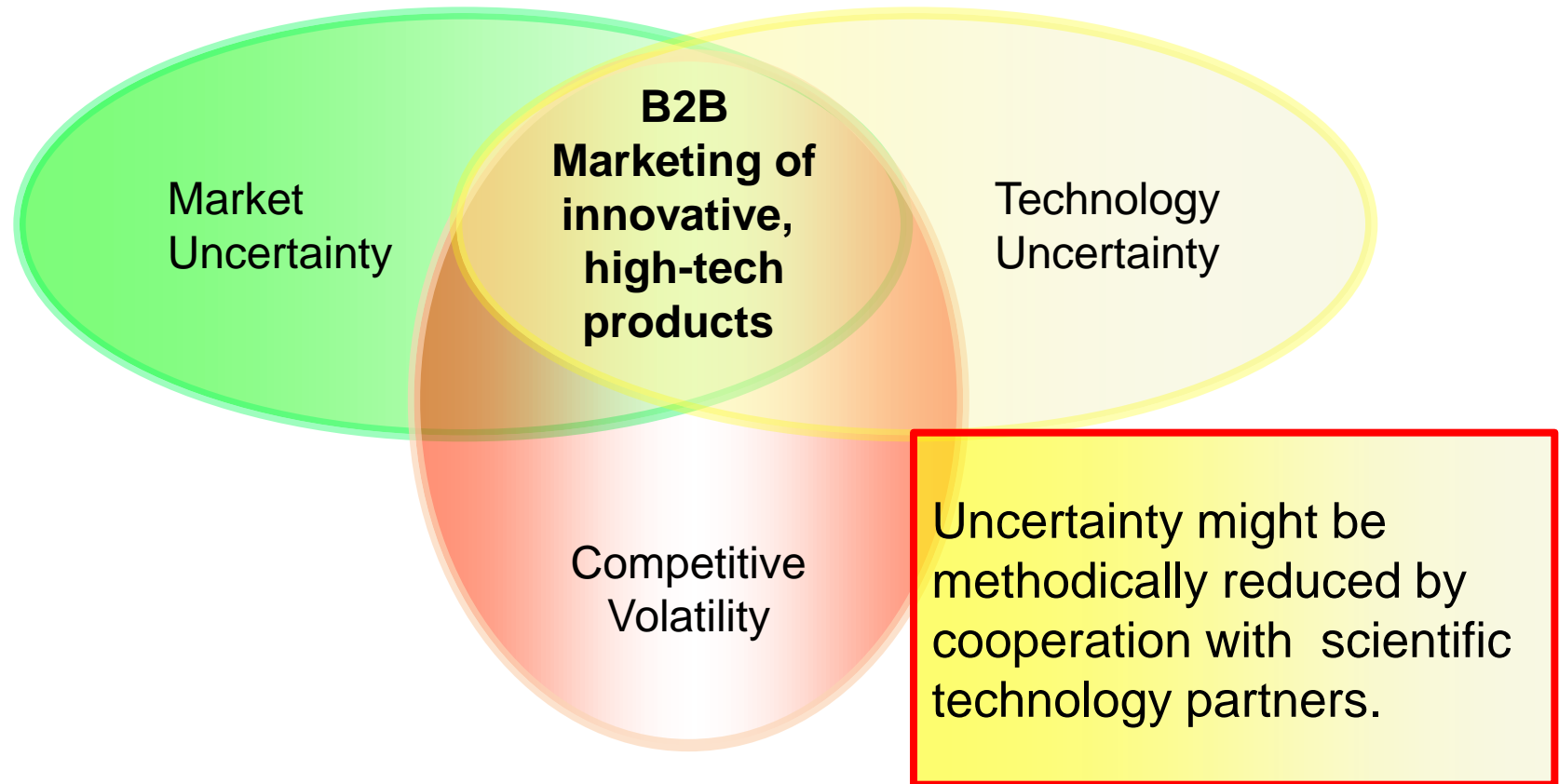
High-Tech Markets - Features

- Close to research (basic and/or applied research)
- Innovative => high-profit, high-risk business
- Dynamic => accelerated behavioral changes of market
=> Dynamics of market segmentation,
=> **difficult to detect in time**
- Fragmented => numerous windows of opportunity,
increasingly difficult to rate.
- Shorter product life cycles **BUT**
- Longer lasting technology life cycles

5. High-Tech Innovation: Market Entry (2/5)

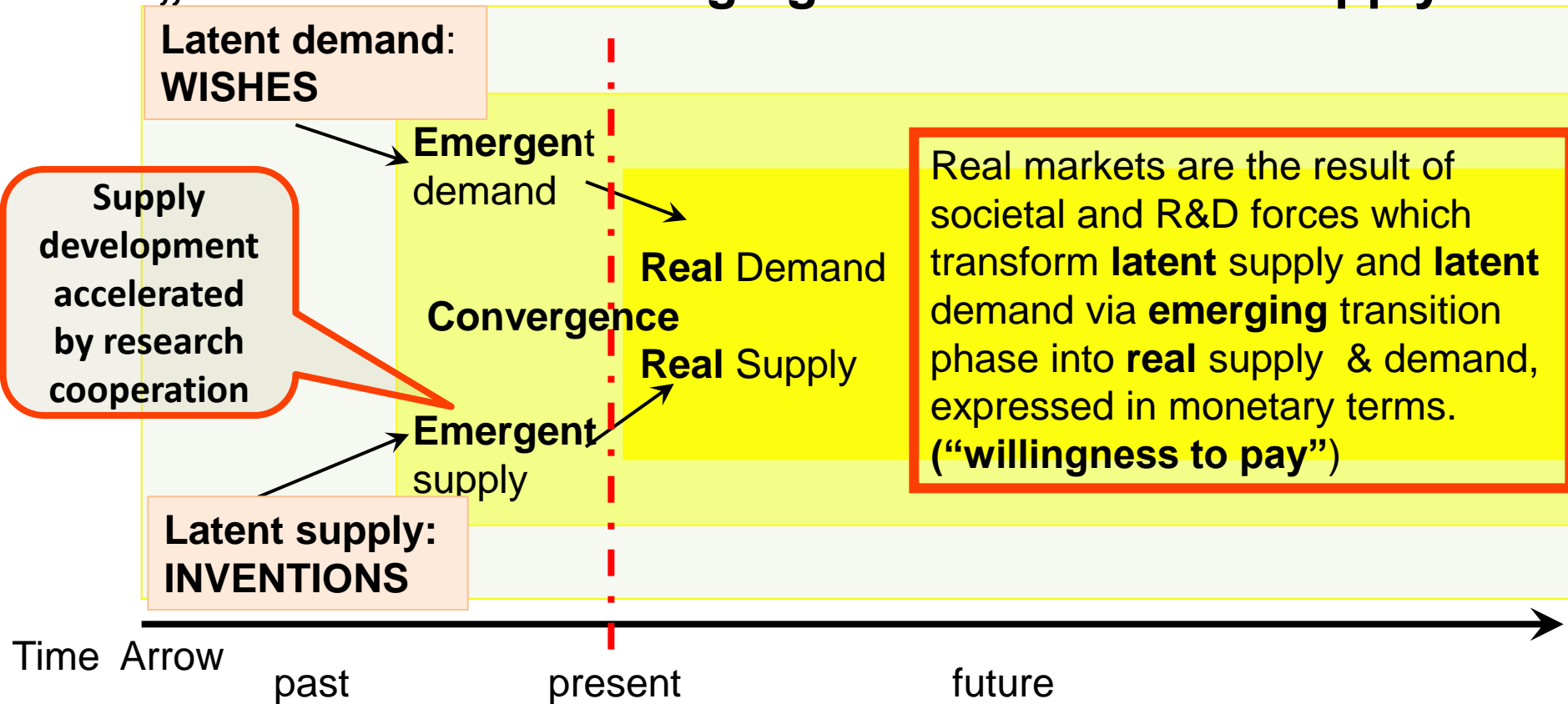
- **Behind each bottleneck** exists a new and innovative (?) market potential.
- Markets are generated by **convergence of supply and demand**.
- Timely Synchronization of supply and demand:
 - **Demand pull**: demand searches for supply
 - **Supply push**: supply strives for demand

5. High-Tech Innovation: Market Entry (3/5)

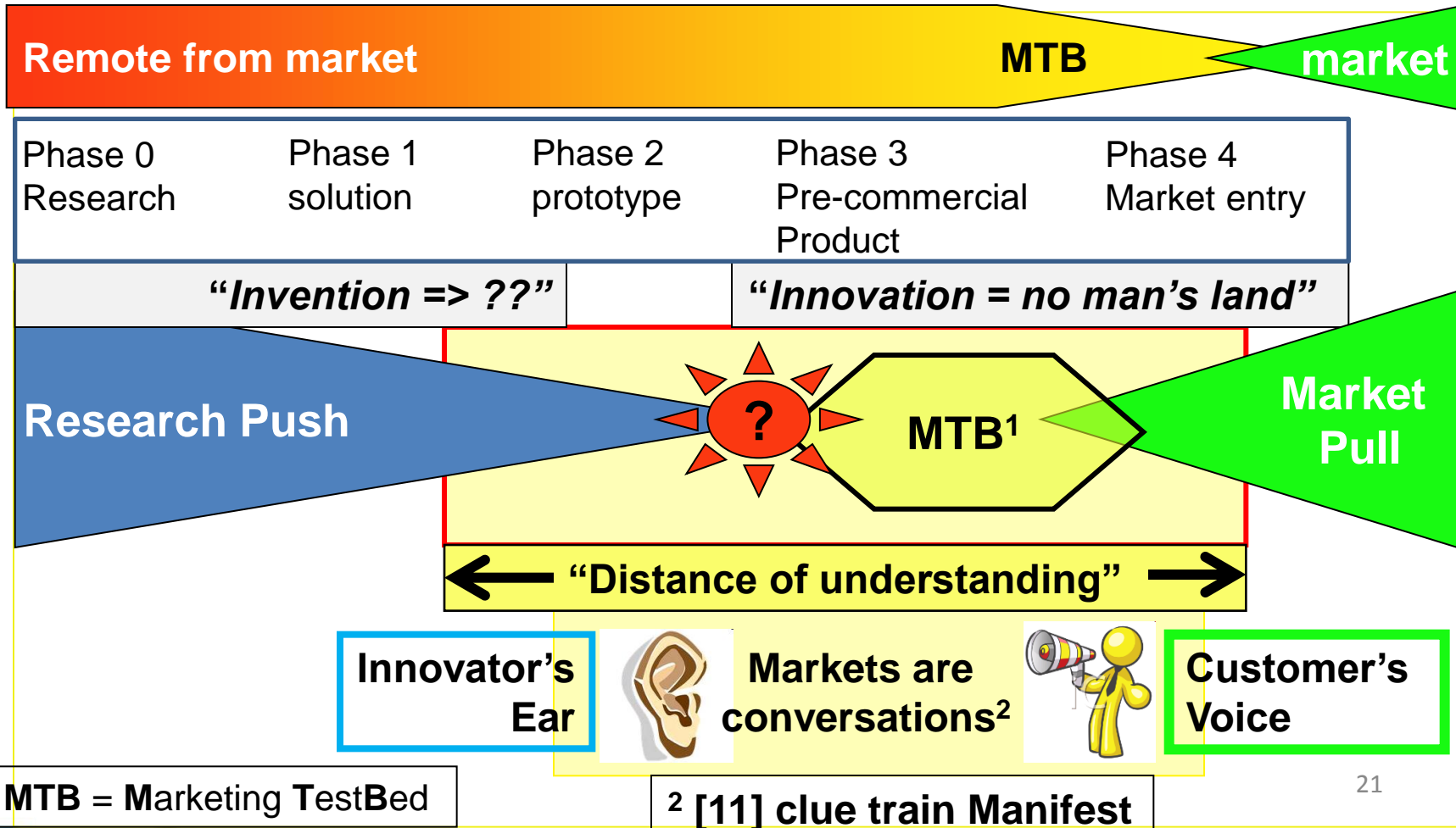


5. High-Tech Innovation: Market Entry (4/5)

„From latent via emerging to real demand / supply“

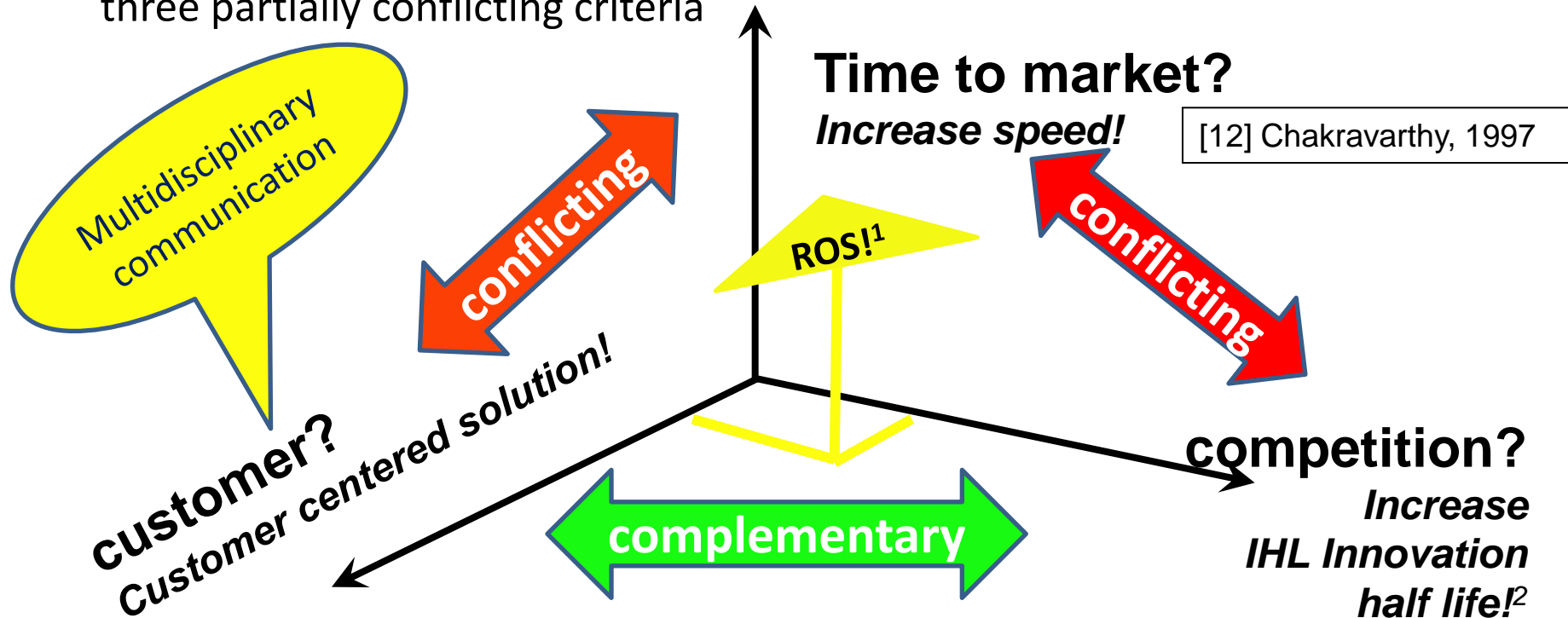


5. High-Tech Innovation: Market Entry (5/5)



6. Marketing Management for High-Tech Products (1/2)

Marketing Management for innovative High-Tech Products deals with three partially conflicting criteria



[12] Chakravarthy, 1997

¹ ROS Return on Sales

² Innovation Half Life = temporal stability of innovation lead compared with the best competitor, known to the innovator. [14] Hasenauer et al.1994

6. Marketing Management for High-Tech Products (2/2)

Key ratios for stressors:

<p>Time To Market Stress: (Break-Even TTM)</p>	$\frac{\text{Required time for BE}^2}{\text{Available time for BE}} > 1$
<p>Solution stress: (C-IHL¹)</p>	$\frac{\text{R\&D time for required innovation lead}}{\text{R\&D time for achievable innovation lead}} > 1$
<p>Profitability stress: (ROS)</p>	$\frac{\text{Required ROS}}{\text{Achievable ROS}} > 1$
<p>1): C-IHL: Competitive IHL</p>	<p>If > 1, then stress caused by short resources (qualitative and/or quantitative)</p>
<p>2) BE: Break Even</p>	

7. Marketing Testbed (1/3)

Marketing Testbed for Market Entry of innovative High Tech Products

Current research focused on development of marketing testbed platform which facilitates the execution of realistic tests of marketing mix measures. [3]

Marketing Testbed is different from usability testbed by focusing on the marketing tools: Marketing mix, technology- & product acceptance, Willingness to pay, understandability of communication content, effectiveness of distribution / selling system. [18]

Another study that applies the marketing testbed method:

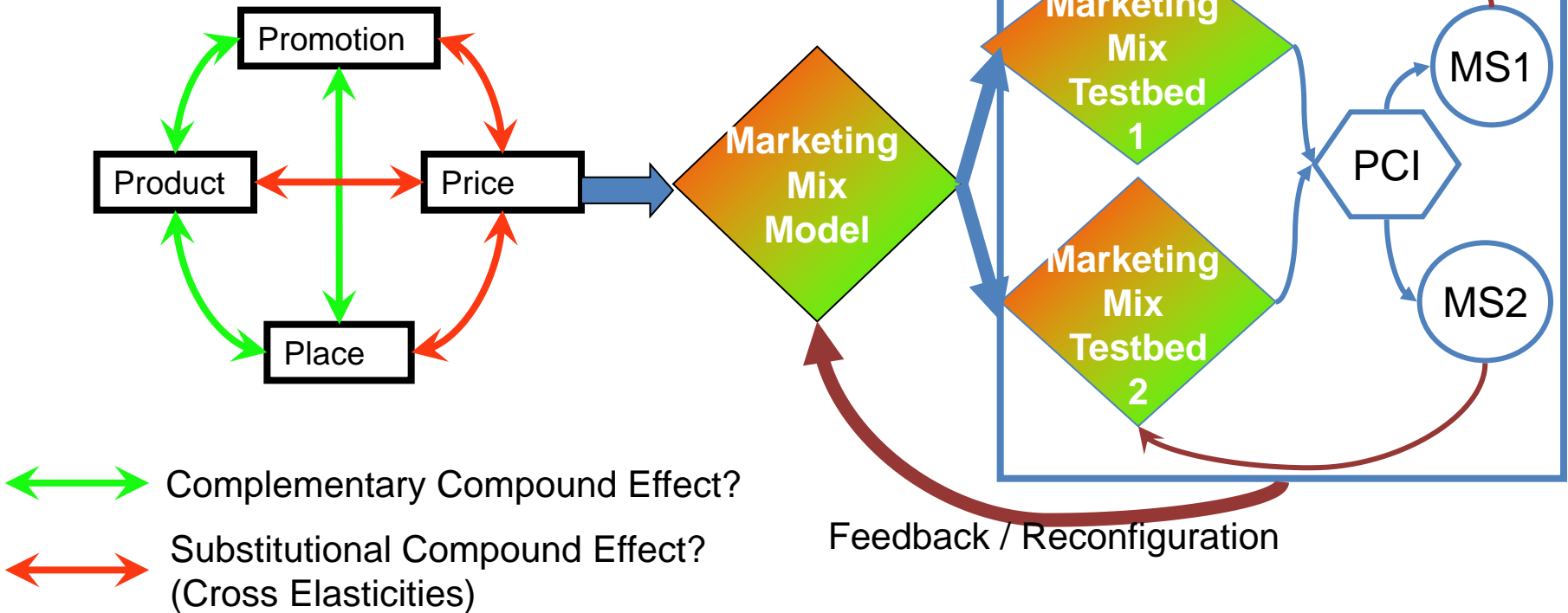
“This activity [establishing the marketing testbed] addresses the need of technology companies to validate the need for their product and its business case.” ([2] <http://www.imaworld.org/?CategoryID=187&ArticleID=511>)



7. Marketing Testbed (2/3)

4Ps Marketing Mix and Marketing Testbeds [13] for High-Tech Products

Watch Segment Dynamics!!



↔ Complementary Compound Effect?
 ↔ Substitutional Compound Effect? (Cross Elasticities)

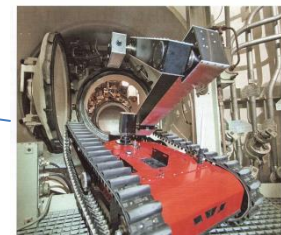
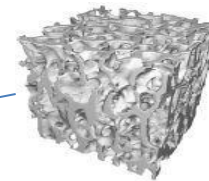
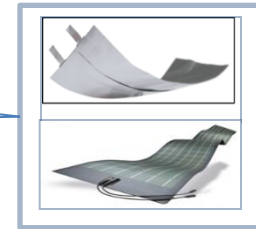
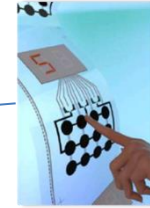
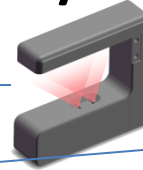
Feedback / Reconfiguration

PCI: **P**roblem **C**entered **I**nterviews
 MS: **M**arket **S**egment

7. Selected Marketing Testbed Examples (3/3)

Current Examples 2010/2011/2012/2013/2014:

- a) 2D Laser Scanner (2011)
- b) Printed foil sensor for MMI⁴ (2010)
- c) Cellular materials (2010)
- d) Wireless strain gauge (2009)
- e) Elastic PV- Li-Battery Sandwich (2007)
- f) Phase change Material (2012, cont.)
- g) Medical care robot for continuous, compliant passive motion (2011, cont.)
- h) Atmospheric plasma on surfaces of functional material (2013, cont.)
- i) High precision 3D printing (2013, cont.)
- j) Fire resistant rubber (2014, cont.)
- k) Peril detection robot (2012 cont.)
- l) AAL robot (2013 con.)
- m) DLC material (2012)



8. Summary (1/1)

- Market entry is a critical phase for economic success of innovative high tech products.
- Multidisciplinary, cross functional cooperation with research institutes are success factor.
- Marketing testbeds will systematically support successful market entry of innovative high tech products & services.

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Thank you for your attention.

Questions?

Comments?

Ideas?

Contact:

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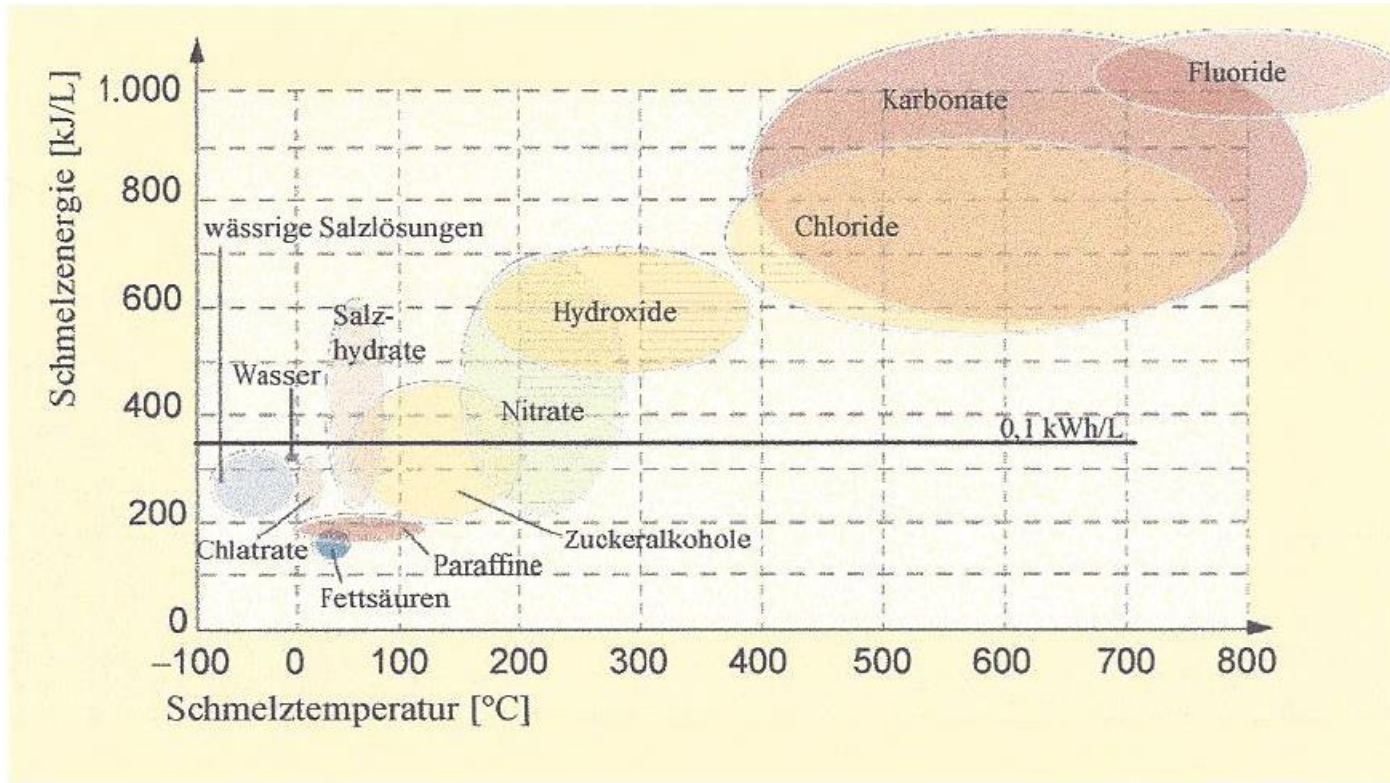
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www.wu.ac.at/mm/team/hasenauer

PCM material landscape ¹⁾



1) Latentwärmespeicher in Gebäude, BINE Themeninfo I/2009

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