



TRIZ based patent analysis for lighting electronics

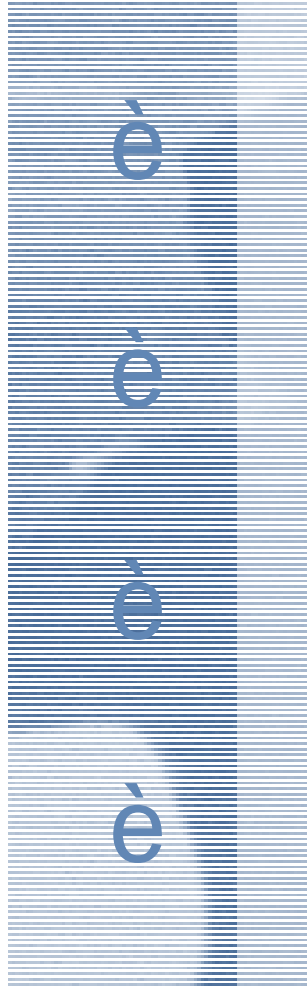
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Aachen, 14th November, 2003



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Figure 1



Introduction

Lighting Electronics

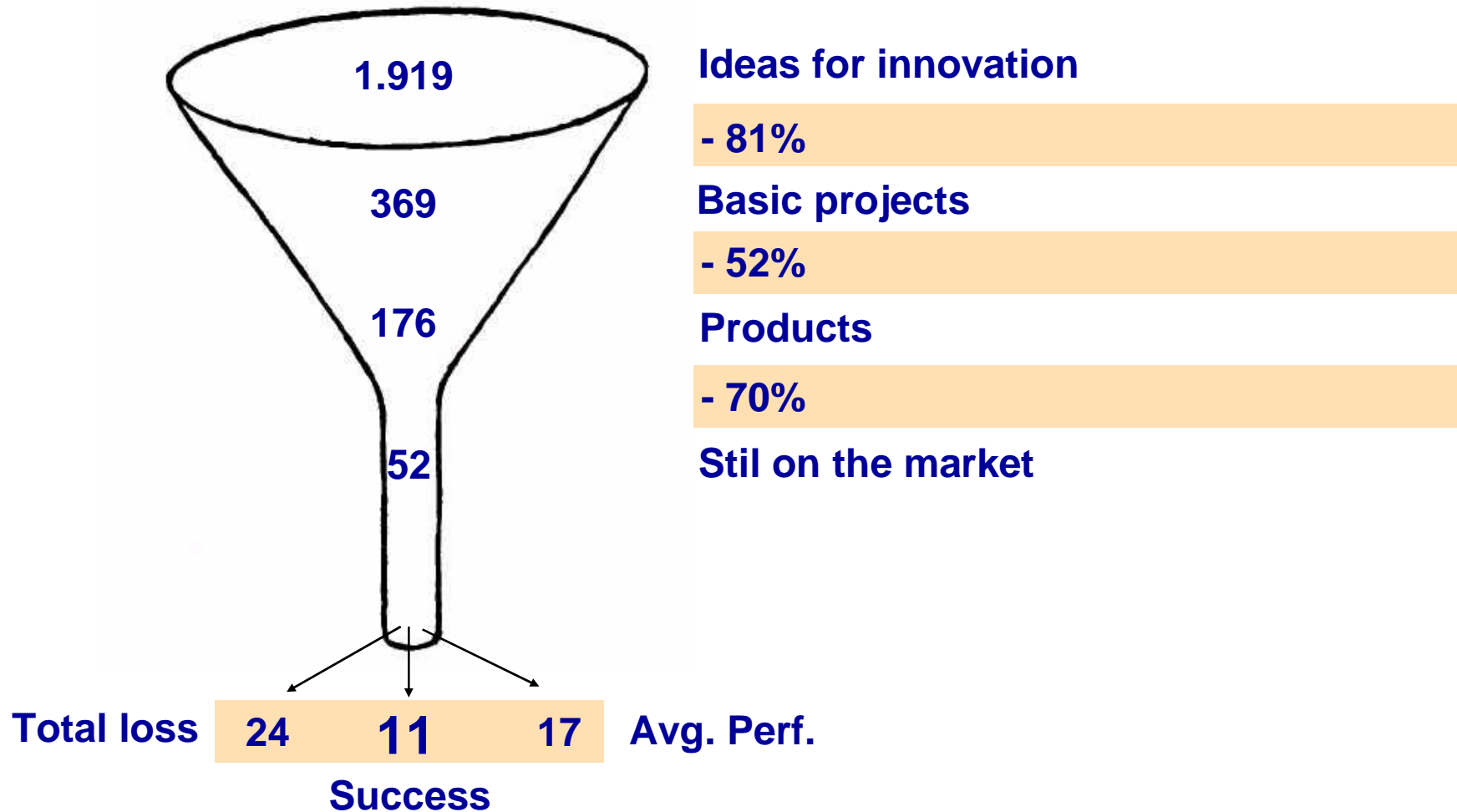
TRIZ based Methodology

Summary



Just 0.6% of all ideas turn out to be successful on market

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Source: Kienbaum Survey 1993



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Figure 3

Comparative Competitive Advantage (CCA)

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◆ **A missing CCA explains 4 out of 5 failed innovations**

◆ **Factors that lead to failure**

Electronic mouse trap	28%	} 80% without CCA
Mee too product	24%	
Technical weaknesses	15%	
Competitive weaknesses	13%	
Price deterioration on market	13%	
Problems in the environment	07%	

Source: Kienbaum Survey 1993



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Figure 4

Patent analysis

- ◆ **Recognition of promising technologies**
- ◆ **General technology view since patents covers 90-95% of worldwide research results**
- ◆ **Efficiently used patent information would reduce**
 - 60% of research time
 - 40% of research cost

Source: WIPO, Tseng, C.H.



Only few companies value their patent stock

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	large companies	investors & analysts	total [%]
quantitative valuation	not normally	hardly realistic	8
qualitative valuation	not normally	important	15
need for valuation	for special tasks	great	

Source: Ernst & Young 2000



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Figure 6



Introduction

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A lot of new systems arise in the lighting industry

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Adaptive fixture

Field based controller

New systems



Dynamization
(dimming level & deflection)

Standard systems

Integration in the building

LED, OLED lamps



Source: Luger, S. 2002



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Figure 8



Introduction

Lighting Electronics

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General conditions for the patent analysis tool

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- ◆ **Should show a relative technology innovation index; comparison to a base line**
- ◆ **Should indicate technology & market attractiveness**
- ◆ **Should act on different hierarchical system levels**
- ◆ **Should be used as a management control tool**

Source: Luger, S.

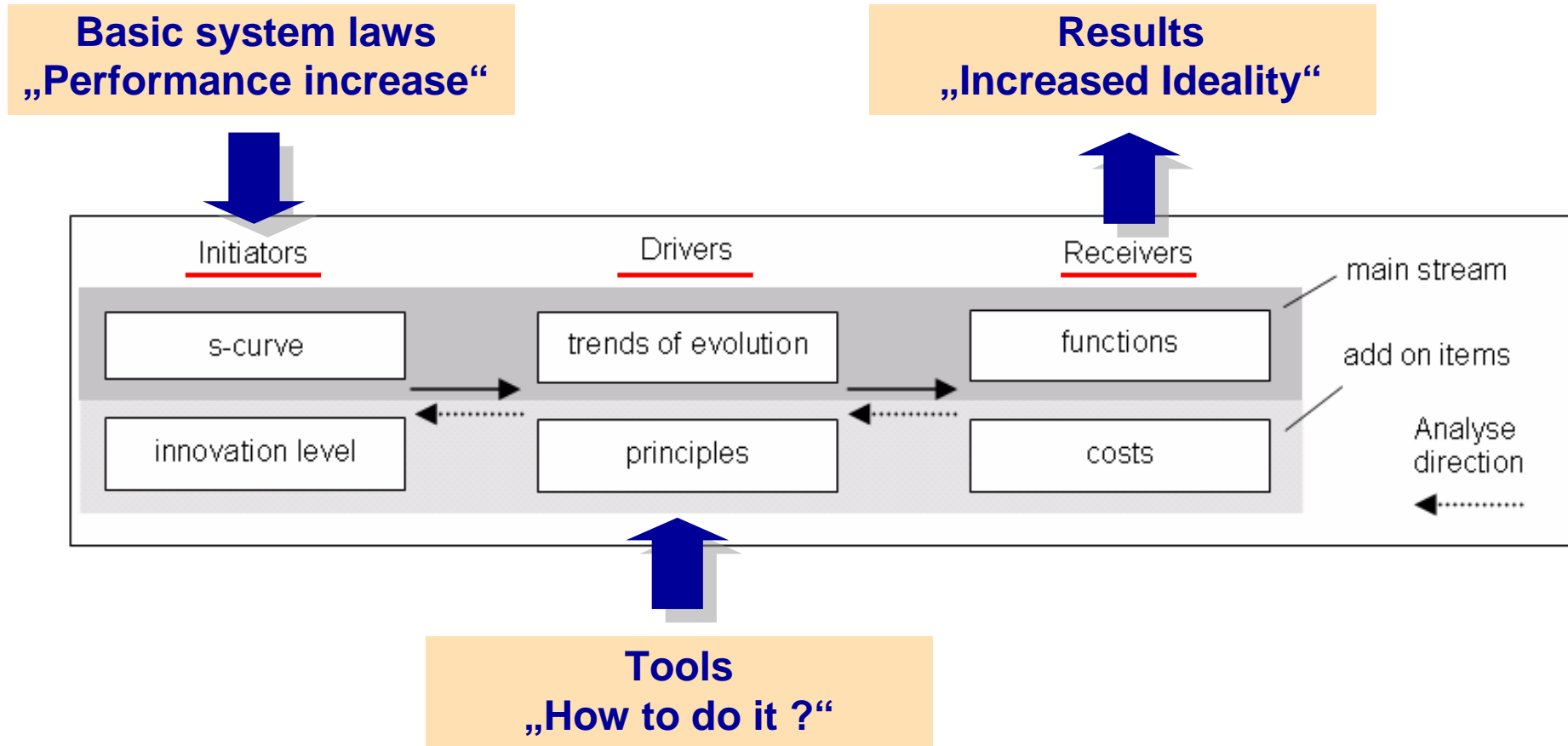


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Figure 10

Basic model for patent assessment: tools and process

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Source: Luger, S.

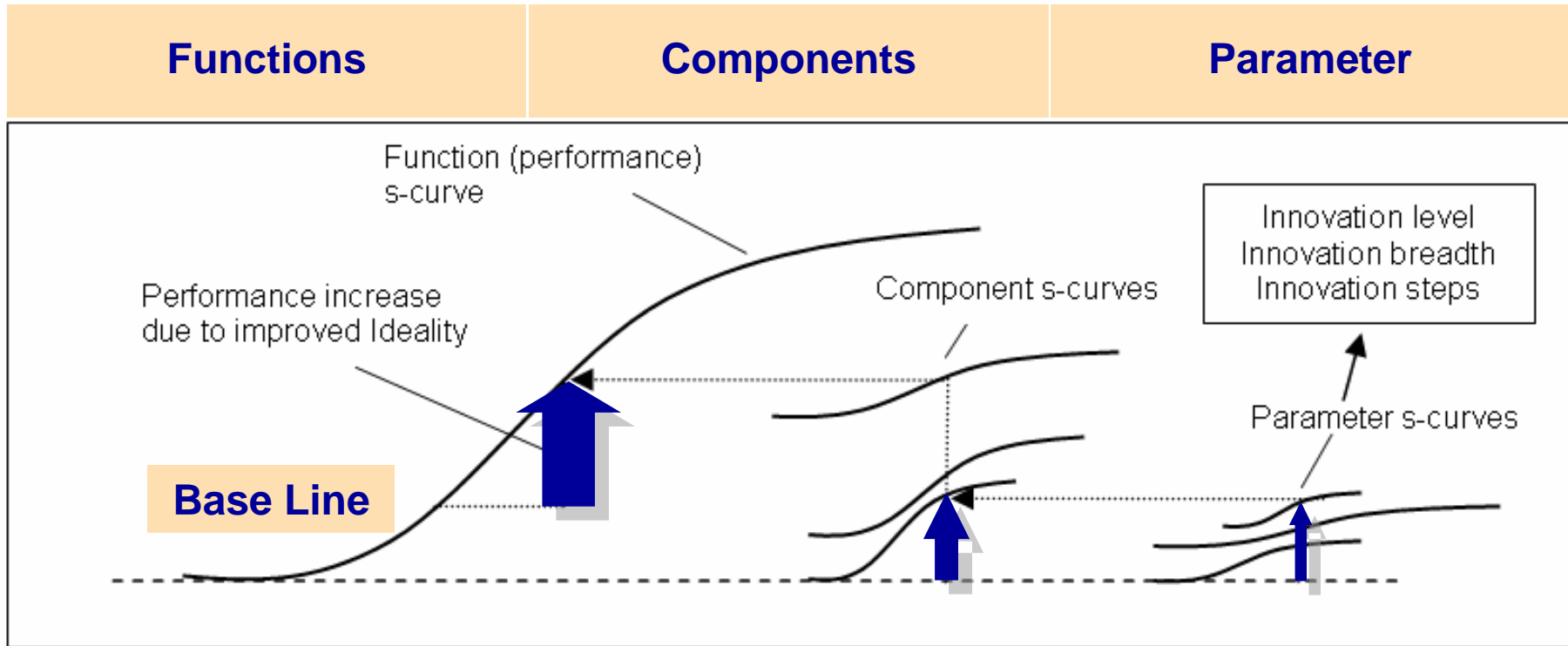


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Figure 11

Basic model for patent assessment: s-curve dependency

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Source: Luger, S.



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Figure 12

Definitions and generated key values

- ◆ **Performance increase =**
functional change (u.f. and h.f.) compared to base line
- ◆ **Innovation breadth =**
changed trend lines / max. number of valid trend lines
- ◆ **Innovation height =**
innovation steps / max. number innovation steps
- ◆ **Innovation level =**
average value of all improved and valid trend lines

Source: Luger, S.



Function analysis

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function (parameter) list	valuation		Improvement	points (w)	base line	new technology	Points
	u/h	Weight					
0 illuminate the room	PUF	9	-1	9	80	70	-90
1 change colour	U	9	+1	9	80	90	90
2 use in different applications	U	3	+3	9	30	70	120
3 link to central systems	U	3	+5	15		90	210
4 set colour independently	U	9					540
5 increase efficiency	H	1					10
6 increase information exchange with central systems	U	3					180
7 programme the setup time	U	1			50	60	10
8 address the system	U	3	+5	15	20	90	210
9 increase the information content	U	9	+3	27	20	80	540
10 combine different system modules	U	3	+5	15	10	50	120
							1940 (5200)
relative function Index (rfi) rfi = 37% uF = 5100/ 1930/ +37,8% hF= 100/ 10/ +10%							37 %

Strategic weight (marketing view)

Performance change (in percentage)

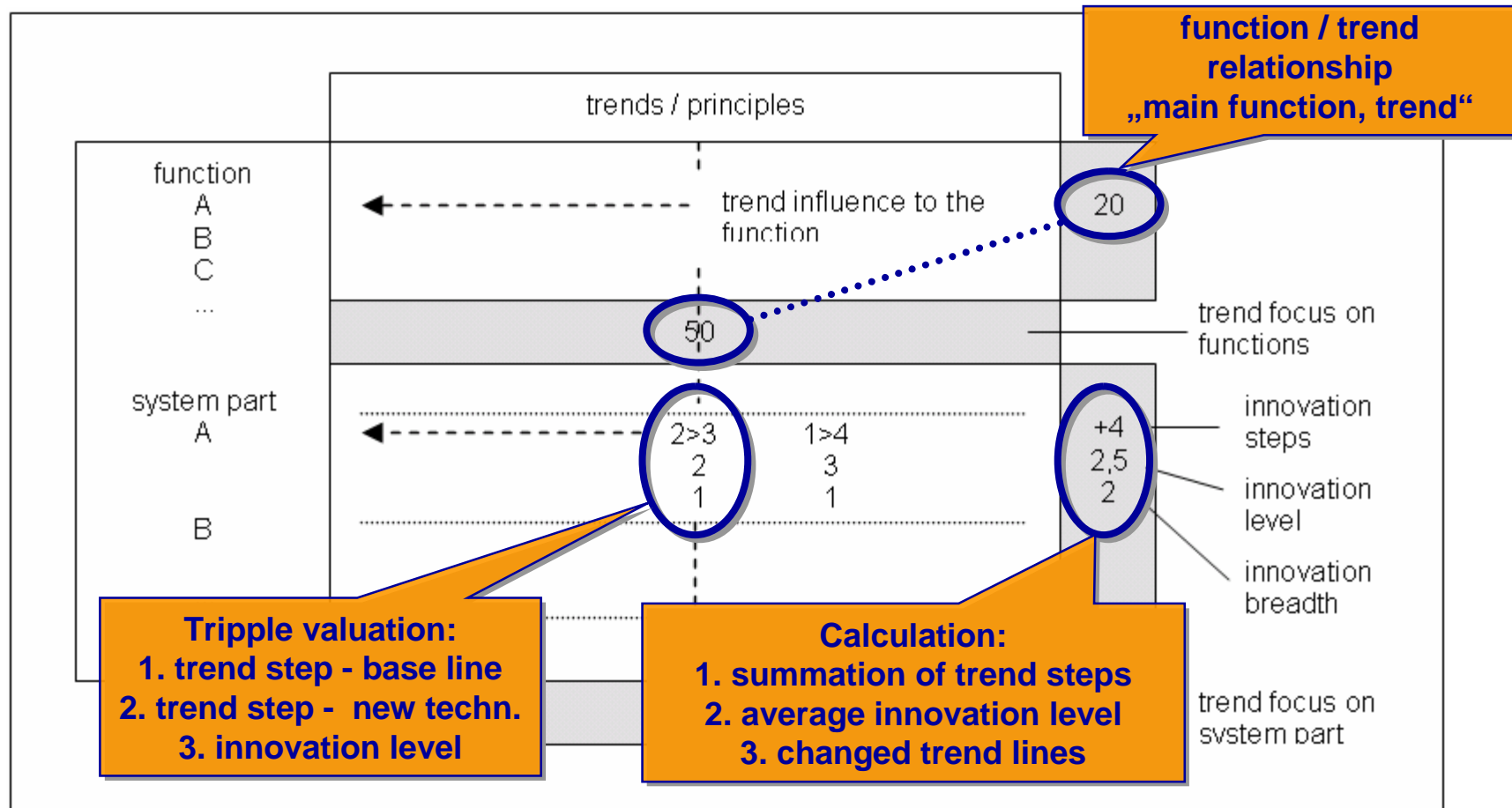
Weighted performance increase for useful and harmful functions

Source: Luger, S.; IMC



Trend analysis based on function/trend (f/t) matrix

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Source: Luger, S.



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Figure 15

Patent assessment process

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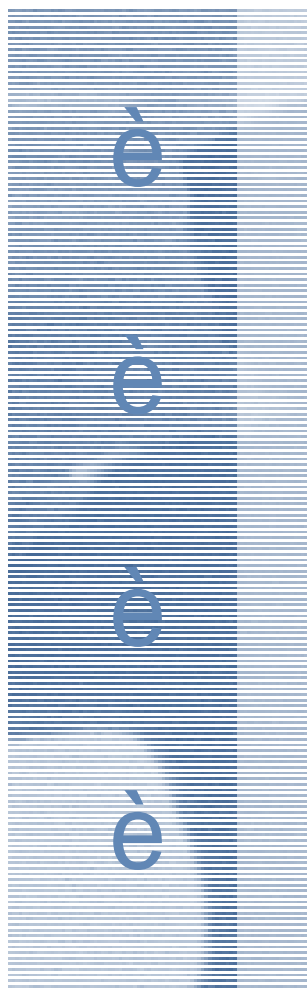
- ◆ **Extract key word list**
- ◆ **Valuate function matrix**
- ◆ **Valuate function / trend matrix**
- ◆ **Calculate costs**
- ◆ **Calculate patent index**

Source: Luger, S.



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Figure 16



Introduction

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Summary

- ◆ **The shown methodology was able to point out also “hidden” patents**
- ◆ **The patent – index was important to understand the worth of patents**
- ◆ **For an overall patent assessment the TRIZ based index can be combined with other parameters (e.g. citation counts,...)**

Source: Luger, S.



**“Most IP valuations
lack the technical significance factor
in their bottom line numbers”**

Source: TAEUS 2003



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Figure 19