Variation of properties for new or improved functions

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Keynote Lecture

The Third TRIZ Symposium in Japan

Aug. 30 - Sept. 1, 2007

TOSHIBA Kenshu Center, Yokohama

enabling creative potential for innovation

company
offer
value theory
markets
inspiration
news

PHILIPS BEKAERT L'ORÉAL TATE & LYLE arcelor cumerio DYMO BMW Pfizer BOSCH Valeo KBC Atlas Copco GOODYEAR InBev TOTAL Levi's P&G BARCO hp Linde sappi Henkel Dr.Oetker invent CREAX creativity for innovation

innovation as a continuous process

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METHODOLOGY

innovation coaching and culture — software, e-learning, training

SOLUTIONS

innovation study — new products, new processes

problem solving — technology and process problems

solution marketing — new markets, business, spin-off

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innovation as an interactive process

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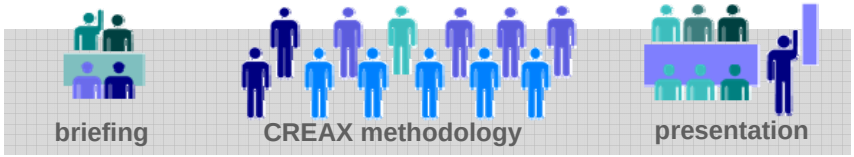
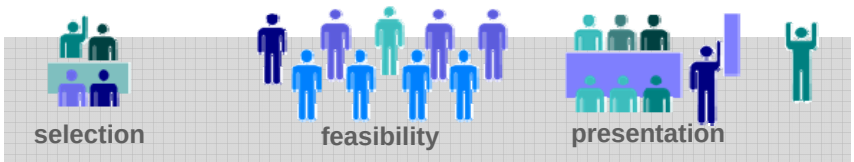


8-10 weeks — top of 150-200 solutions



4-5 weeks — top 5 - 15 solutions

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innovation gallery and product box

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creativity test as a free awareness tool

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Abstraction: the ability to abstract concepts from ideas

Connection: the ability to make connections between things that don't initially apparent connection

Perspective: the ability to shift ones perspective on a situation – in terms of space and time

Curiosity: the desire to change or improve things that everyone else accepts as the norm

Boldness: the confidence to push boundaries beyond accepted conventions. Also the ability to eliminate fear of what others think of you.

Paradox: the ability to simultaneously accept and work with statements that are contradictory.

Complexity: the ability to carry large quantities of information and be able to manipulate and manage the relationships between such information.

Persistence: the ability to force oneself to keep trying to derive more and stronger solutions even when good ones have already been generated.

http://www.creax.com/csa/

CREAX creativity for innovation

CREAX .net a portal reference on innovation

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Articles Associative searching / web Authors Basic Research Blogs on creativity and innovation Booklists Books Brains, thinking and learning Brainstorming guidlines in films Brand Name Generators Business Inspiration Companies Conferences 2006 Conferences 2007 Conferences 2008 Conferences 2010 Creative Environment Creative persons Design Ideas Discussion Groups Dutch creative sites Dutch trend sites Dystopias Education and training Europe and innovation Films French creative sites Fun Future films Future markets Future organisations or portals Gadgets German creative sites Hands on tools Handy overviews - checklists Historywatching (Inspiration from the past) House of the future Idea Management - Suggestion box Idea Markets Innovation Innovation galleries Internet assisted creativity Inventions Kids Knowledge Management Linguistic sources of inspiration Magazines MindMapping Numbers On line techniques Organisations Overall pictures Past visions of the future that (n)ever happened Patents Perception Ilusion Puzzles Process Quotes Scenarios Scientific resources Search Engines Site suggestions Social Creativity and Innovation Software Spaces and places for inspiration Starting Places Statistics Target groups Techniques Tests The future of... The world in ... Theory/methods of future studies Timelines of the future Trends for consumers Trends general Trends in food Trends in HRM - Work Trends in ICT Trends in marketing Trends in technology Trends in transport Trendspotting Trendwatchers - Futurists Triz Triz Principles with examples Triz Trends Useful Visual thinking - Imagination Web 2.0. Weblogs on future Wikipedia Wildcards: big possible future surprises

Articles
- Dr. John C. Houtz (overview)
- The Creative Economy ...
- Fast Company
- Innovationtools
- Business 2.0.
- Why do we still believe ...
- How to be creative?
- Ideachampions

Associative searching / web
- Visual Thesaurus
- WebBrain
- Grokker
- Inxight StarTree
- KartOO
- TouchGraph
- Keyword Map
- Smart Thesaurus

Authors
- Clayton Christensen
- John Kao
- Michael J. Gelb
- Mihaly Csikszentmihalyi
- Nordstrom and Ridderstrale
- Tom Peters
- Great Thinkers and Visionaries
- De Bono (1)
- De Bono (2)
- Michalko
- Osborn - Parnes
- Roger von Oech

Fun
- 100 worst books
- 100 worst ideas
- Dilbert Mission Statement ...
- Loesje
- OxymoronList
- The Humor Project
- Time passing by
- Totally Absurd Inventions
- Type your name
- Web Economy Bullshit Generator
- Seriousplay (Lego for adults)
- Imagination at work
- Zefrank
- World's Tallest Virtual ...

Future films
- Artificial Intelligence
- Back to the Future
- The Matrix
- Terugblik vanuit 2020

Future markets
- The Foresight Exchange ...
- Long Bets

Future organisations or portals
- 21st Century
- Arlington Institute
- Association of Professional ...
- Club of Rome

Scenarios
- Basic Concepts Future Studies
- Syntens Toekomstwijzer
- Mining the future
- Nederlandse toekomstverkenning...

Scientific resources
- Creativity Based Information ...
- Encyclopedia of Creativity
- Ideonomy: the science of ideas

Search Engines
- Google Labs
- Yahoo Buzz
- Google Zeitgeist
- InOrder
- Deep Query Manager (BrightPlan...
- Beyond Google (deepsearch)
- Rollyo
- Simply Google

Site suggestions
- The Logo Company
- Brain Dancing
- BrainReactions
- Think for A Change

Social Creativity and Innovation
- Global Ideas Bank
- KidCast

CREAX creativity for innovation

innovation is more of the good, less of the bad

company
offer
value theory
markets
inspiration
news

PERFORMANCE

better, faster towards perfect

resolution, luminance, contrast

RELIABILITY

safer, greener, less harm

silent, less heat, safe, green

CONVENIENCE

ergonomics, design, automatic

easy, nice, automated

PRICE

economics, cheaper to free

economic, cheap, free

CREAX creativity for innovation

strategic market segments

free
perfect
everywhere
always

company
offer
value theory
markets
inspiration
news

more for more

ESTĒE LAUDER

LOUIS VUITTON

ROLLS ROYCE

THE RITZ-CARLTON BERLIN

intel inside
pentium

more for less

metro

skype

ALDI MARKT

Google

IKEA

intel inside
celeron

simyo

HOTEL FORMULE 1
ACCOR hotels

LOGAN

RYANAIR

less for less

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search innovations | SEARCH | Advanced search

Search history
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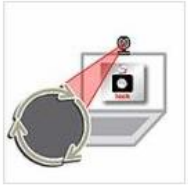
Submit an innovation



Login with a smile
★★★★★
29 views
Comments

Flashbag inflates with more data
★★★★★
74 views
Comments (2)

Sway Stool
★★★★★
71 views
Comments (1)

CREAX
creativity for innovation

CREAX monthly newsletter

company
offer
value theory
markets
inspiration
news

CREAX Directed Variation newsletter

Dear CREAX newsreader,

We would like to thank all of you who have read our newsletter, visited our website, attended our events and activities, contributed and supported us in 2006. CREAX wishes you a merry Christmas and a prosperous 2007.

Even though December is a short month, we have been able to select some great examples for the end of the year.
The highlights of this issue are:

Pasta pot - holes in the lid allow easier draining

Self-erasing paper - paper turns to white after 24 hours

SpokePOV - turns bicycle

Acoustic sensors - make any

CREAX creativity for innovation

connections across domains

connections
classification
variation
beer case
visualisation
Product DNA

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connections across domains

connections
classification
variation
beer case
visualisation
Product DNA

CREAX creativity for innovation

introduction | properties | functions | patents | conclusion

connections across domains

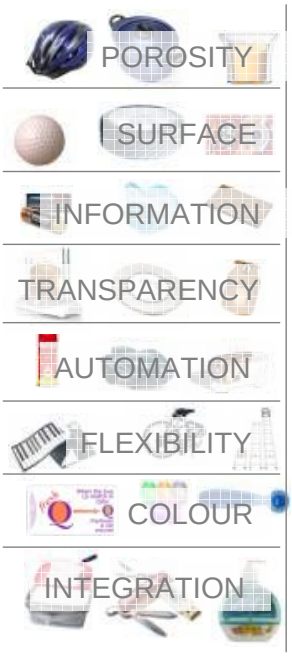
connections
classification
variation
beer case
visualisation
Product DNA

hollow, porous,	POROSITY
carved, protruded,	SURFACE
feedback, warning,	INFORMATION
translucent, clear,	TRANSPARENCY
self, intelligent,	AUTOMATION
flexible, jointed,	FLEXIBILITY
blue, red,	COLOUR
combined, kid,	INTEGRATION

CREAX creativity for innovation

variation of properties for new functions

connections
classification
variation
beer case
visualisation
Product DNA



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introduction | properties | functions | patents | conclusion

variation of properties for new functions

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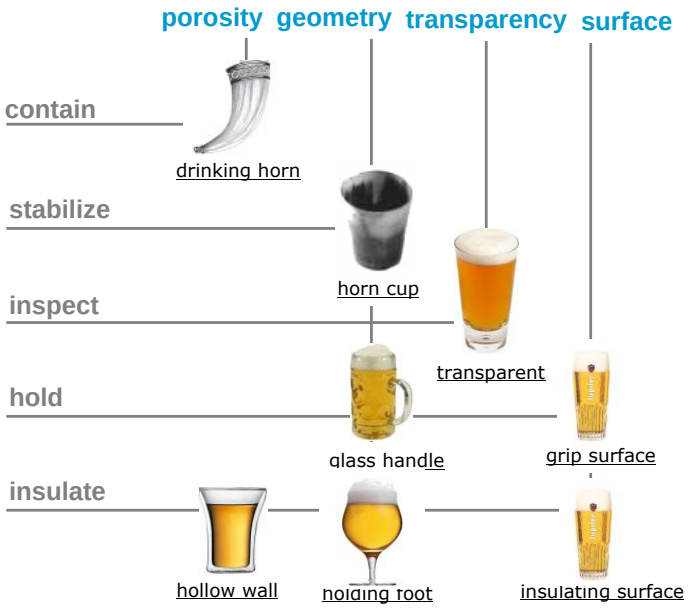
visualisation
Product DNA



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variation of properties for new functions

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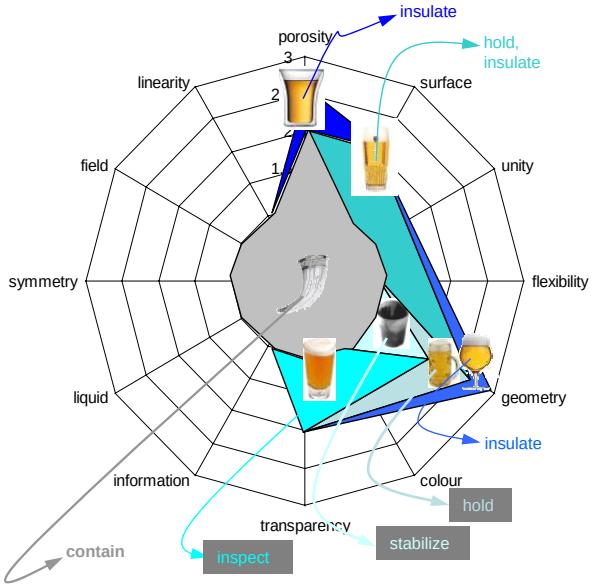
beer case
visualisation
Product DNA



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introduction | properties | functions | patents | conclusion

variation of properties for new functions

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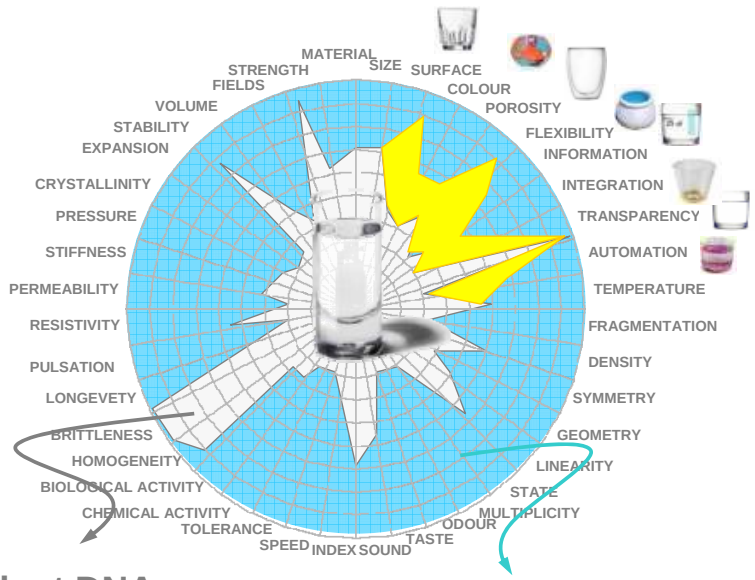
visualisation
Product DNA



Product DNA

Innovation Potential

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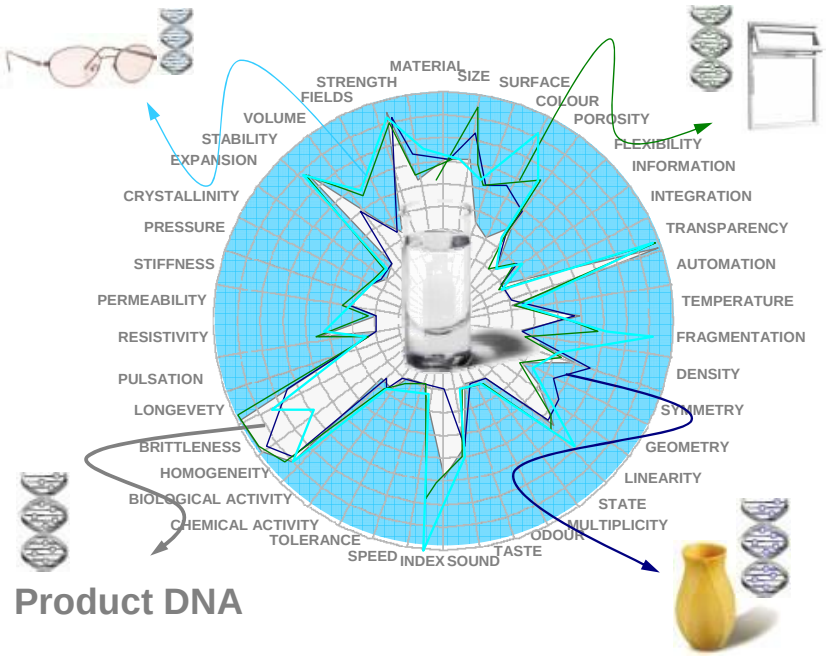
variation of properties for new functions

connections
classification
variation
beer case
visualisation
Product DNA



Product DNA

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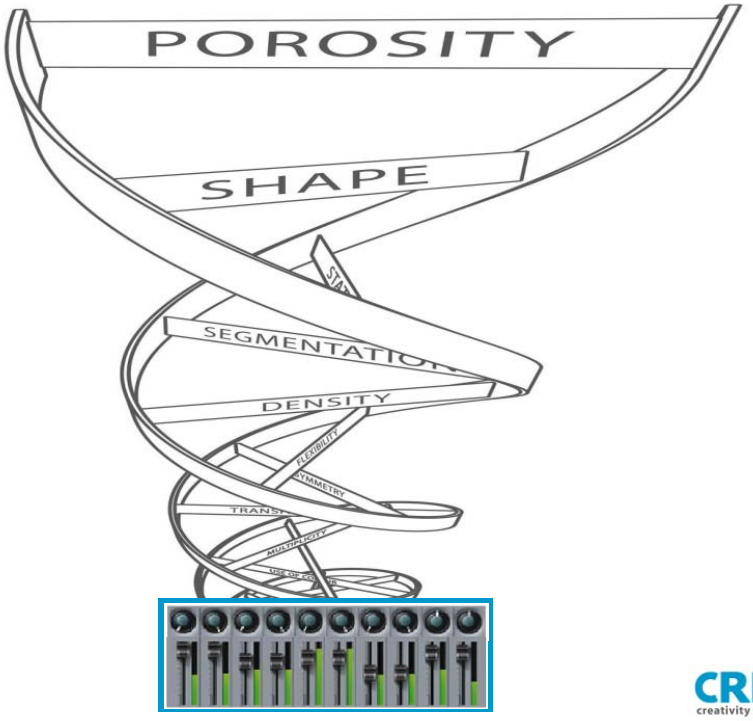
Product DNA, a base for analogy

connections
classification
variation
beer case
visualisation
Product DNA



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solutions change, functions stay the same

classification
extraction
PF matrix
chocolate
worksheets
software

field
Electroosmosis
Electrocapillary Effect
Electrostatic Induction
Electrolysis
Electrophoresis
Ferromagnetism
Ionic Exchange
Lorentz Force
Magnetostriction

porosity
Absorption
Capillary Condensation
Capillary Evaporation
Capillary Pressure
Osmosis
Use of foam

weight
Gravity

pressure
Bernoulli's Theorem
Pascal Law
Pump
Forced Oscillations

pulsation
Resonance
Shock Wave
Inertia

shape
Funnel Effect
Ellipse
Spiral
Brush Constructions
Jet Flow

surface
Surface Tension
Wetting
Coanda Effect
Condensation

MOVE LIQUID

sound
Acoustic Cavitation
Acoustic Vibrations
Ultrasonic Capillary Effect
Ultrasonic Vibrations

temperature
Boiling
Evaporation
Super Thermal Conductivity
Thermocapillary Effect
Thermomechanical Effect
Thermal Expansion
Dessication
Superfluidity

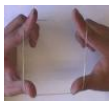
volume
Archimedes' Principle

http://function.creax.com/

CREAX creativity for innovation

property – function extraction

classification
extraction
PF matrix
chocolate
worksheets
software

	porosity	flexibility	surface	shape	unity
hold	Bowling ball	 Rubber band	[illegible] nail	Ergonomic pen	
transport	Foam metal	Flex keyboard		Hipporoller	Airbus Beluga
stack	Stackable pen	Jointed bicycle	Stack containers	Modular seat table	Furniture
cool	Aeron chair		WOK with fins		

CREAX creativity for innovation

the property – function matrix

classification
extraction
PF matrix
chocolate
worksheets
software

	porosity	surface	unity	flexibility	geometry	colour	transparency	information	liquid	symmetry	fra...	li...
grip	x	x		x	x					x		x
transport	x		x	x	x				x			x
glide	x	x			x				x			
stack	x	x	x		x					x		x
contain	x	x							x			
store	x		x	x	x				x	x		x
cool	x	x					x		x		x	
identify	x	x				x	x	x		x	x	
hold	x	x		x	x					x		
join	x	x								x		
assemble	x		x		x	x				x		x
customise			x			x	x			x		
protect			x	x		x					x	
operate			x	x	x			x	x	x	x	x
disperse			x						x		x	
fit				x	x	x				x		x
reach			x	x					x			x
stabilize			x	x	x				x	x		x
appear	x	x			x	x	x	x				x
indicate		x				x	x	x			x	
detect						x	x	x			x	
select						x		x			x	
					x	x	x					
		x	x			x	x				x	

PROPERTIES

FUNCTIONS

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the property – function matrix

classification
extraction
PF matrix
chocolate
worksheets
software

	porosity	surface	state	multiplicity	temperature	crystallinity	flexibility	fragmentation	pulsation
stabilize (no melt)	x	x	x	x	x	x		x	x
prevent blooming			x	x	x	x		x	x
break	x	x			x	x			
shape							x	x	
remove bubbles			x	x	x				x
imporve health	x			x					
improve melting			x	x	x	x		x	
gloss			x	x	x	x	x		
demould			x	x	x		x	x	

x 1-3 patents
x 4-7 patents
x 8-15 patents
x 16-50 patents

Aerated chocolate with micro bubbles for improved *stability* WO2004056191

Process for controlling the solidification or crystallization using magnetic *field* US2002001647

Crystallization process using ultrasound US6630185

Process for retarding fat bloom in fat-based confectionery masses by pulsing ultrasound EP0765606

Production of chocolate with *transglutaminase* WO02063974

A visually attractive, freshly prepared, fat based confectionery product formed of at least one elongated strand of extrudate of fat based confectionery material with temporary flexibility WO2004098304

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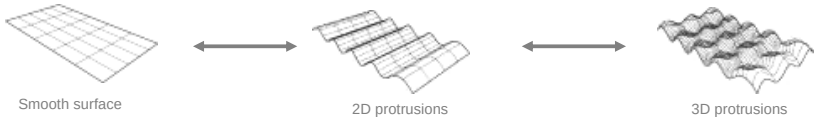
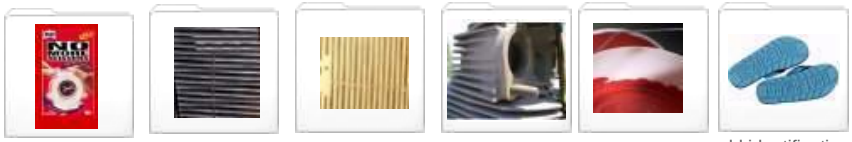
the property – function worksheets

classification
extraction
PF matrix
chocolate
worksheets
software

property SURFACE





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the property – function worksheets

classification
extraction
PF matrix
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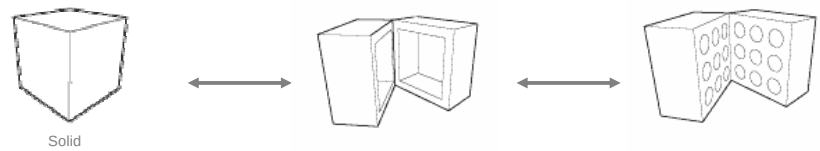
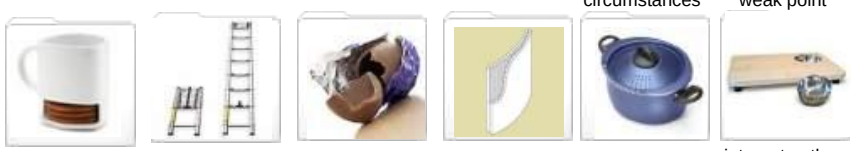
worksheets
software

property POROSITY





CREAX creativity for innovation

the property – function worksheets

classification
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PF matrix
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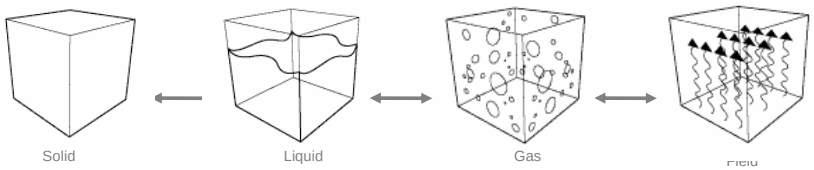
worksheets
software

property STATE



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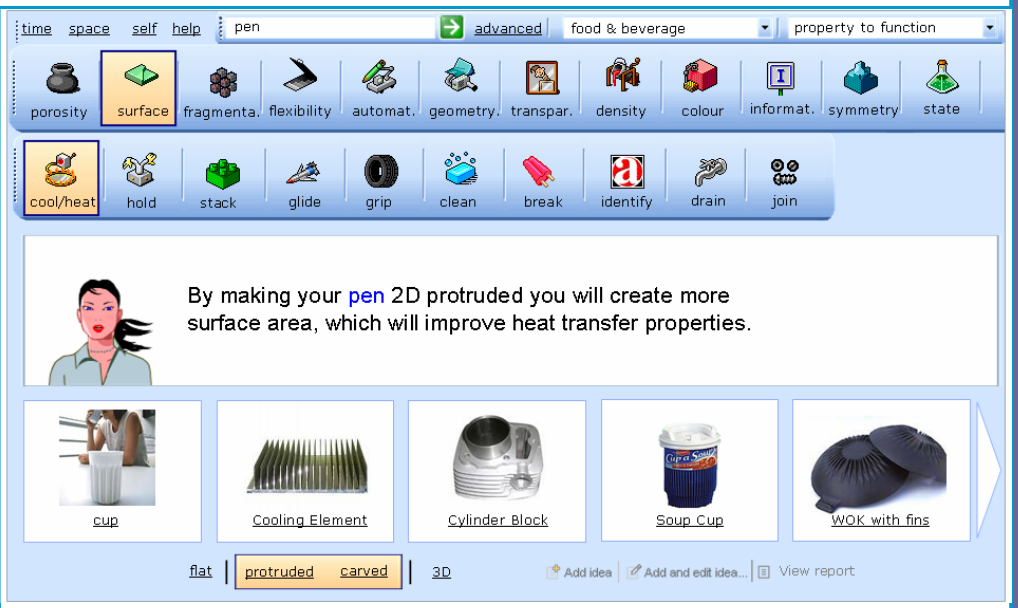
DIVA – the innovation calculator

classification
extraction
PF matrix
chocolate
worksheets
software



CREAX creativity for innovation

DIVA – the innovation calculator

classification
extraction
PF matrix
chocolate
worksheets
software

time space self help | pen | advanced | food & beverage | property to function

porosity | surface | fragmenta. | flexibility | automat. | geometry. | transpar. | density | colour | informat. | symmetry | state

cool/heat | hold | stack | glide | grip | clean | break | identify | drain | join

By making your pen 2D protruded you will create more surface area, which will provide better grip to hold your pen.

Handle

hurriquake nail

Ski pole

Shoe sole

Basket ball

flat | protruded carved | 3D | Add idea | Add and edit idea... | View report

CREAX creativity for innovation

introduction | properties | functions | patents | conclusion

DIVA – the innovation calculator

classification
extraction
PF matrix
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worksheets
software

time space self help | pen | advanced | food & beverage | property to function

porosity | surface | fragmenta. | flexibility | automat. | geometry. | transpar. | density | colour | informat. | symmetry | state

cool/heat | hold | stack | glide | grip | clean | break | identify | drain | join

Carves or protrusions in your pen can provide weak points where some part can easily break off at a controlled location. Where could you introduce a deliberate weak point?

Chocolate

Breakable blade

Blister pack

Dosable Pill

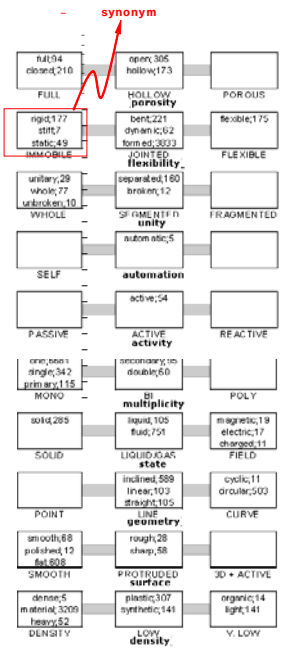
Mars bar

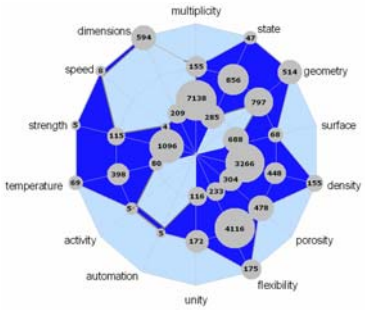
flat | protruded carved | 3D | Add idea | Add and edit idea... | View report

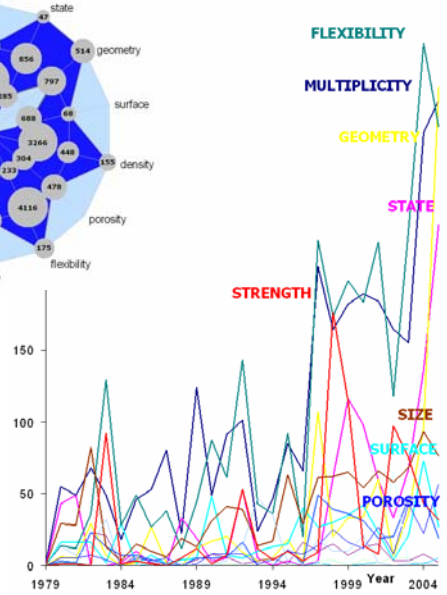
CREAX creativity for innovation

property adjectives – function verbs

classification
evolution
glass case
patent data
sugar case







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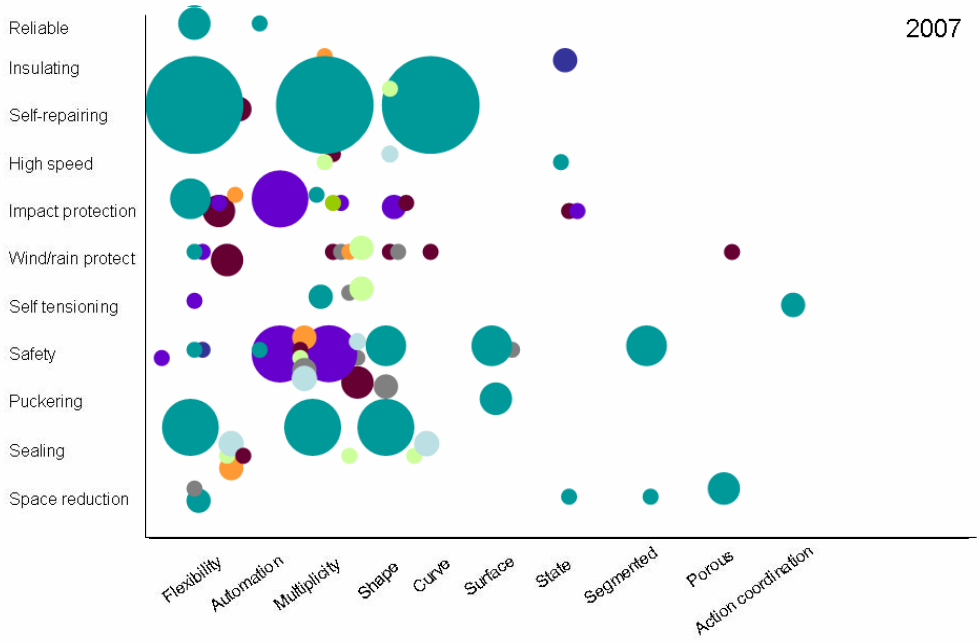
property-function evolution

classification
evolution
glass case
patent data
sugar case



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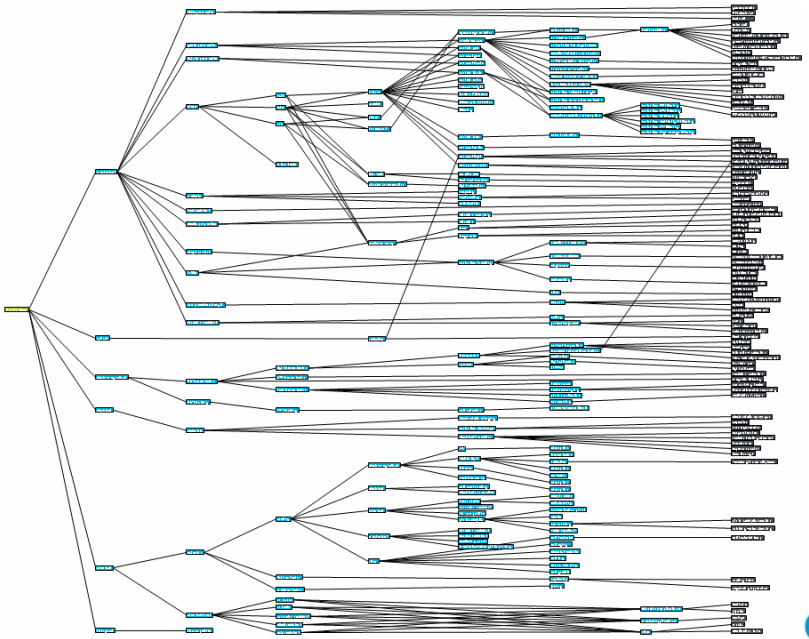
Property overview glass

classification
evolution
glass case
patent data
sugar case

glass properties functions applications



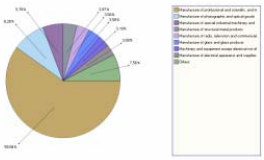
CREAX creativity for innovation

property-function evolution

classification
evolution
glass case
patent data
sugar case

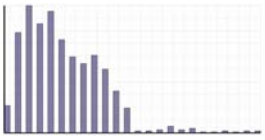
PF search

Product DNA



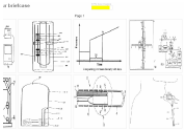
players

inventors

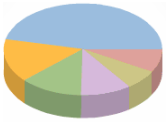


activity

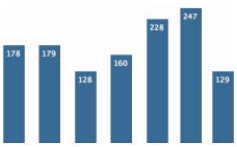
geography



visuals



industries



new markets

CREAX creativity for innovation

Product DNA filtering of liquid sugar

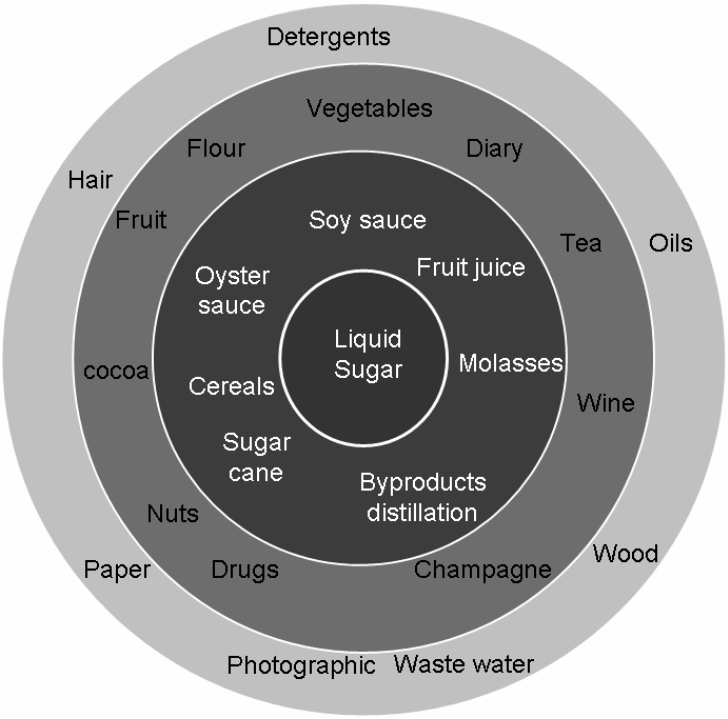
classification

evolution

glass case

patent data

sugar case



CREAX creativity for innovation

varying properties for new or improved function

DIVA software tool proposes a **checklist for innovation**

Product DNA is applicable across all domains, bringing a generic **common ground for technology transfer**

Function and property extraction in patent literature, is still challenging. A **three year research project** for CREAX – University of Leuven is being funded.

Property function relations brings **simplicity** in innovation methodologies whilst adding **functionality**.

There is more to innovation then properties and functions

CREAX creativity for innovation

Thank You

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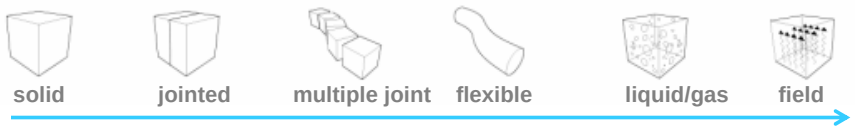
CREAX creativity for innovation

Appendix A - Distilled Patent Scenarios TRIZ to properties



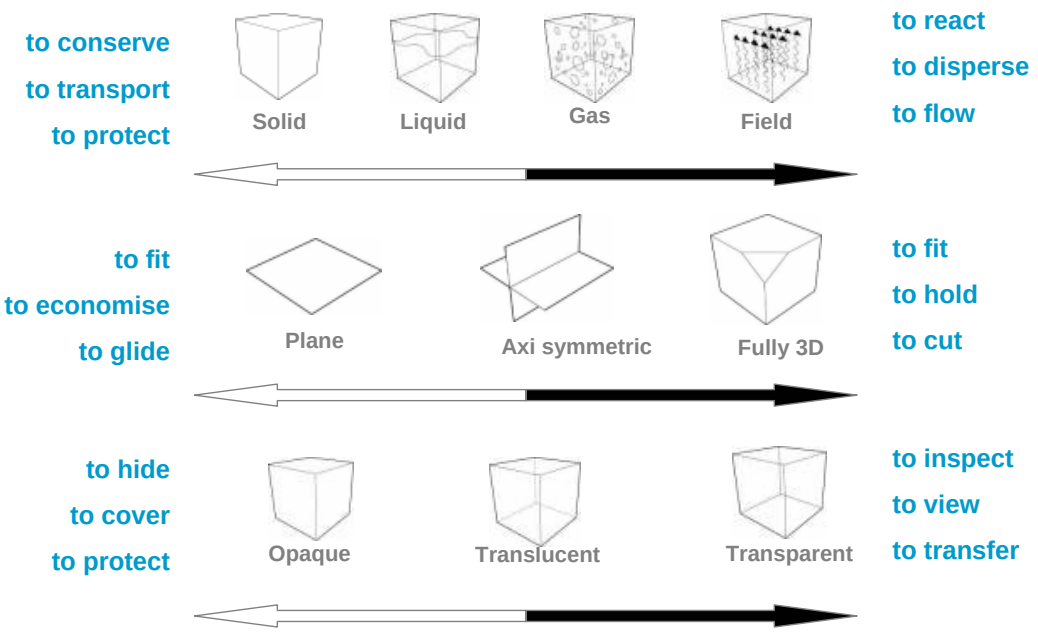
FLEXIBILITY + STATE

AUTOMATION + INFORMATION

STATE + FRAGMENTATION

CREAX creativity for innovation

Appendix B – Variation of properties in both directions



CREAX
creativity for innovation