# D2.2 - ANNEX 1

Working material for the sessions 3, 4, 5 and 6  
(English version)

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**BEYOND EFFICENCY**  
**TOWARDS DISCONTINUITY**
Summary

- From Dante to Merloni (through Santa Fe)
- Operative excellence, or the *praise of continuity*
- Creative destruction, or the *praise of discontinuity*
- Creative disorganization, or the *dynamic equilibrium between continuity and discontinuity*
- All things are ready, if our minds be so (Shakespeare, 1599)
Provocations from Middle Age

Midway upon the journey of our life
I found myself within a forest dark,
For the straightforward pathway had been lost.
(Dante Alighieri, La Divina Commedia, Inferno, 1306)

MIDWAY UPON THE JOURNEY OF OUR LIFE = STORE OF KNOWLEDGE

FOREST DARK = COMPLEXITY

Provocations from Santa Fe

EDGE OF CHAOS

ORDER
CREATIVE DESTRUCTION
DISORDER

INNOVATION AREA
Between Deserts and Tornados

ORDER

EDGE OF CHAOS

DISORDER

AREA OF LIFE

Between Bureaucracy and Anarchy

ORDER

EDGE OF CHAOS

DISORDER

AREA OF COMMUNICATION
Cues from the Theory of Complexity

Dynamic equilibrium at the edge of chaos

Disequilibrium

Provocations to companies

ORIENTARSI NELLA COMPLESSITA

VOI SIETE QUI
Summary

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Praise of Continuity: the 'Excellence' Circle

[Diagram showing the 'Excellence' Circle with objectives, actions, and effects related to operational excellence.]
Praise of Continuity

Incremental improvement of:

- Processes
- Products/services
- Organizational-managerial models

Summary

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Quick loss of Competitive Advantage

The enterprise has already moved to advantage n.2
Profits from a series of repeatable actions
Launch
Exploitation
Counterattack

The Strategy of Upsetting

Period (years)

Period (years)
CREATE Project

Praise of Discontinuity: the 'Creation' Circle

Creative disorder of:

- Processes
- Products/services
- Organizational-managerial models
Future belongs to those who can imagine it

*Logic takes you from A to B. Imagination takes you everywhere.*
(Albert Einstein, 1955)

*Imagination is the first source of human happiness*
(Giacomo Leopardi, 1837)

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- All things are ready, if our minds be so (Shakespeare, 1599)
Dynamic equilibrium at the edge of chaos

'Excellence' Circle

ACTION
Plan the present

Lever
RELATIONAL CAPACITY

OBJECTIVE
Sharing to improve the context

EFFECT
Continuity

STATE
Operational excellence

EDGE OF CHAOS
ORDER

CREATIVE CAPACITY

'Creation' Circle

ACTION
Imagine the future

Lever
CREATIVE CAPACITY

OBJECTIVE
Creation of new contexts

EFFECT
Discontinuity

STATE
Creative destruction

EDGE OF CHAOS
DISORDER

MANAGERIAL APPROACH
ENTREPRENEURIAL APPROACH

Hydraulic Analogy at the Edge of Chaos

‘Creation’ Circle

Continuity

‘Excellence’ circle

ORDER

FOSSILIZATION

CHAOTIC DISORDER

DISINTEGRATION

EDGE OF CHAOS

PERFECT ORDER

LIFE

DISORDER

Discontinuity
# Between Formal and Informal Systems

<table>
<thead>
<tr>
<th>FORMAL SYSTEM</th>
<th>INFORMAL SYSTEM</th>
<th>PREDOMINANT SYSTEM</th>
<th>EFFECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORDER:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>perfect order</td>
<td>Structure</td>
<td>Conformism</td>
<td>Formal system</td>
</tr>
<tr>
<td></td>
<td>Defined procedures e control systems</td>
<td>Risk aversion</td>
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<tr>
<td></td>
<td></td>
<td>Inertia</td>
<td></td>
</tr>
<tr>
<td>ORDER &amp; DISORDER:</td>
<td>See above</td>
<td>See below</td>
<td></td>
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<tr>
<td>chaotic order</td>
<td></td>
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<td></td>
<td>Undefined procedures e control systems</td>
<td>Diversity</td>
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<td></td>
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<td>Risk propensity</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Change</td>
<td></td>
</tr>
<tr>
<td>DISORDER:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chaotic disorder</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

# Towards creative disorganization

- **Operational excellence**
- **Creative path**
- **Evolution (development)**
- **Efficient path**
- **Creative destruction**
- **Involution (decline)**
- **Order**

**Discontinuity**
- **Dynamic equilibrium at the edge of chaos**
- **Disequilibrium**

**Continuity**
Creating a Summary

- From Dante to Merloni (through Santa Fe)
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- Creative destruction, or the praise of discontinuity
- Creative disorganization, or the dynamic equilibrium between continuity and discontinuity
- All things are ready, if our minds be so (Shakespeare, 1599)

Conclusions: ready to catch the creative moment
Dedicated to…

… the wise people

who live at the edge of chaos …

… move on, we’ll be lucky …

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Through the Lens of
CREATIVITY

Creativity is to...

...PUT TO OTHER USES
...ADAPT
...MODIFY
...MAGNIFY
...MINIFY
...SUBSTITUTE
...COMBINE
...REVERSE
Creativity is to...

...PUT TO OTHER USES

- Other ways to use as is?
- Other uses if slightly modified?

Environmental packaging for fast food

- Made with potatoes, limestone and fiber
- Biodegradable
- McDonald’s testing them
- Also eatable?
Creativity is to...

...PUT TO OTHER USES

Nitroglycerin  →  Teflon

Creativity is to...

...ADAPT

• What else works like this?
• What else could I copy?

Razor blades  →  Interchangeable brush head
CREATE Project

Creativity is to...

...ADAPT

"Breathing" shoe  "Breathing" jacket

CREATE Project

Creativity is to...

...ADAPT

Electric chicken-pluck  Epilady
Creativity is to...

...MODIFY

• Change meaning, colour, shape, movement, ...?

Ergonomic grip for water bottles

Snap-saver No-brainer ®

• Snap the lids on the bottom
• No need for looking for lids anymore
• 20$ for a 12-container set
Creativity is to…

...MAGNIFY

• Stronger, larger, exaggerated?
• Add an ingredient, a component?

Gillette Mach3  Shick Quattro  Gillette M3Power

Creativity is to…

...MAGNIFY

Chillow® - Refrigerated Pillow

• A chiller that goes into your pillow so that you have a cool spot to place your head
• Non electric, non toxic, no noise
• $30
• Also for dogs! ($40)
Creativity is to...

...MINIFY

- Smaller, lighter, shorter?
- Subtract an ingredient, a component?

from Hard Disk to CD to USB drive

Walkman
Creativity is to...

...SUBSTITUTE

• Other material, process, power source, approach?

Car speakers for mobile phone

Creativity is to...

...COMBINE

• Blend, alloy, ensemble?
• Combine units, purposes, processes?

Cellphone + Camera +
MP3 player
Creativity is to...

...COMBINE

Antibacterial paint

- Calcium hydroxide added to paint
- 20 harmful microbes killed for 6 years
- Redecorate and disinfect at the same time

Creativity is to...

...COMBINE

Shick razor ‘Intuition’

- Hair-removing cream and razor together
- Can be used in the shower
- Depilating in a single move
Creativity is to...

...REVERSE

- Backwards, upside down, inside out?
- Open, close?

Ketchup Top -Down

- New design for bottles
- You don’t need to shake the bottle anymore
- Sauce flows out gently
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ATTRIBUTE-VALUE CHAIN

A STATISTICAL TECHNIQUE FOR EXTERNAL MAPPING
SUMMARY

1. INTRODUCTION TO THE METHODOLOGY
   - Product knowledge
   - Product attributes
   - Consumer’s personal values

2. METHODOLOGY
   - Aim of the analysis
   - Results of the analysis

3. PHASES OF ANALYSIS
   - DERBI case study
   - Explanation of each phase
   - Building of the cognitive map (Attribute-Value Chain)
1. INTRODUCTION TO THE METHODOLOGY

PRODUCT’S KNOWLEDGE

Consumers perceive products as a combination of:

- **ATTRIBUTES** (or features)
- **PERSONAL VALUES** that consumers try to satisfy by using or buying the product
PRODUCT’S ATTRIBUTES

• Attributes are inside every product

• Attributes correspond to features through which every product could be described
  – For example: colour, shape etc.

ATTRIBUTES belong to different types:

• **ABSTRACT ATTRIBUTES**: they represent the subjective, intangible features of a product
  For example: comfort of a scooter

• **CONCRETE ATTRIBUTES**: they represent the physical, tangible features of a product
  For example: colour of a scooter
EXAMPLE: PRODUCT ATTRIBUTES

CREATE Project

PERSONAL VALUES

Values are mental representations of important personal objectives or needs that customers want to satisfy by using or purchasing the product

For example: what do you want from life?
PERSONAL VALUES

• Values are **stable**, because they are long-life objectives

• To **emotional level**, values drive consumers to choose in a specific way

2. METHODOLOGY
AIM OF THE ANALYSIS

The aim of the analysis is to:

- link each product attribute with one or more consumer's personal values
- represent in a cognitive map attributes, values and links between them

EXAMPLE: “HIGH PRICE” ATTRIBUTE
ATTRIBUTES-VALUE CHAIN: WHAT IS IT?

Attributes are the physical characteristics that may be used to describe a product.

Values are mental representations of important personal objectives or needs that customers want to satisfy by using or purchasing the product.

ATTRIBUTES-VALUE RELATIONSHIP

ATTRIBUTES-VALUE CHAIN: METHODOLOGY

Is based on a questionnaire and needs 4 steps:

1. Definition of the target sample
2. Compilation of the questionnaire
3. Data statistical analysis
4. Building of the cognitive map (Attribute-Value Chain)
QUESTIONNAIRE SESSION

The questionnaire is compiled by Derbi’s possible end-users. It is structured in four sections:

1. Identifying information
2. Selection of a macro-category of product’s attributes (performances, look/design, service or comfort)
3. Evaluation of the selected attributes’ macro-category
4. Evaluation of several personal values (independently of the product)

Section 1: IDENTIFYING INFORMATION

Answer to the following questions:

- Age [......................]
- Sex [M] [F]
- Job [.......................]
Section 2: SELECTION OF AN ATTRIBUTES' MACRO-CATEGORY

Here are indicated four categories for the product. Order these categories by assigning them a score from 1 to 4 in ground of your consideration. (4 = max. score).

- PERFORMANCE
- LOOK/DESIGN
- SERVICE
- COMFORT

Section 3: EVALUATION OF THE SELECTED ATTRIBUTES' MACRO-CATEGORY

If you gave maximum score to PERFORMANCE category, then answer to the following questions, marking the box that shows the desired score.

The scores indicate respectively:

0 → no interest
1 → low interest
2 → medium-low interest
3 → medium-high interest
4 → high interest
5 → maximum interest
EXAMPLE: SCOOTER cat. PERFORMANCE

- How much do you care for operating-range? [0] [1] [2] [3] [4] [5]
  Operating-range: km covered without refuelling

  Road-holding: capacity of remaining adherent to the ground

  Reliability: component life-time; preservation of declared performance

Section 4: EVALUATION OF THE PERSONAL VALUES

- We have chosen 20 personal values which could be considered as common values of human being

- The potential end-user evaluate each one of this values giving them a score (from 0 to 5)

- These values are independent from the product
Section 1: EXAMPLE


DATA STATISTICAL ANALYSIS

Statistical analysis needs two steps:

1. Identification of the most meaningful attributes and values, with relative weight
2. Identification of the relations between the elements previously selected
Using canonical correlation analysis it is possible to identify the values more correlated with product attributes.

On the contrary, all attributes are taken into consideration.

1st STEP: IDENTIFICATION OF ATTRIBUTES AND VALUES

The sum of the scores in each questionnaire gives the relative weight of each value and attribute.

<table>
<thead>
<tr>
<th>AMBIZIONE</th>
<th>CALM / RELAX</th>
<th>IMAGINATION</th>
<th>FUN</th>
<th>STATUS</th>
<th>SENSE OF BELONGING</th>
<th>TRUST</th>
<th>FREEDOM OR OTHER RIGHTS</th>
<th>HONESTY</th>
<th>HAPPINESS</th>
<th>RESPONSIBILITY</th>
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</thead>
<tbody>
<tr>
<td>2</td>
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<td>0</td>
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<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

Score in a questionnaire

Sum of the scores (RELATIVE WEIGHT)
2nd STEP: IDENTIFICATION OF THE RELATIONS

Looking the statistical matrix that comes from canonical correlation:

For example:

<table>
<thead>
<tr>
<th></th>
<th>IMMAGINAZIONE</th>
<th>OVERTWIST</th>
<th>STATUS</th>
<th>FIDUCIA</th>
<th>FELICITÀ</th>
<th>SICUREZZA</th>
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</thead>
<tbody>
<tr>
<td>LINEA</td>
<td>0.4</td>
<td>0.2</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>IMMAGINE</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>0.2</td>
<td>0.5</td>
<td>0.2</td>
</tr>
<tr>
<td>MARCA</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.1</td>
<td>0.2</td>
<td>0.1</td>
</tr>
<tr>
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<td>0.0</td>
<td>0.3</td>
<td>0.0</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>DIMENSIONI</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.4</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>COLORE</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.3</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Relation value between attribute and value (1=maximum correlation)

BUILDING OF THE COGNITIVE MAP

For example, we propose the cognitive map for 'Performance' category of a Derbi scooter
CREATE Project

Weak relationships

Average relationships

Strong relationships

ENVIROMENT
ALTRUISM
FREEDOM
HAPPINESS
TRUST
SAFETY
LAW
ECO-COMPATIBILITY
AGILITY
ROAD HOLDING
RELIABILITY
SAFETY
CONSUMPTION

CREATE Project

Weak relationships

Average relationships

Strong relationships

ENVIROMENT
ALTRUISM
FREEDOM
HAPPINESS
TRUST
SAFETY
LAW
ECO-COMPATIBILITY
AGILITY
ROAD HOLDING
RELIABILITY
SAFETY
CONSUMPTION
CREATE Project

Weak relationships
Average relationships
Strong relationships
Very strong relationships

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PROVOCATION & MOVEMENT

A DIVERGENT TECHNIQUE FOR THE CREATIVE PROCESS
PROVOCATION & MOVEMENT

Adapted from E. De Bono

**Provocation**: you leave reasoning by using an apparently illogic thought

Example: *restaurants do not let you to pay*

**Movement**: you get a new useful idea after having accepted the previous provocation

Esempio: *you don't need to pay immediately* (Diners Club)

**TECHNIQUES OF PROVOCATION & MOVEMENT**

**Provocation**

1. Negation
2. Change of logic
3. Exaggeration
4. Dream

**Movement**

1. Extracting a principle
2. Focusing on differences
TECHNIQUES OF PROVOCATION

1. NEGATION

Steps:
1) Detailed description of something we take for granted
2) Negate reality

- Particularly useful to examine methods, procedures or stable systems
- It shakes existing procedures, forcing to consider them deeply and in a new way
1. NEGATION

Examples:

Ex. 1: “Scooter is a mass product”
   ‘P: Scooter is a tailoring product”

Ex. 2: “You change your hull when it is strictly necessary”
   ‘P: Let’s change our hull just for the fun of it”

Ex. 3: “You buy your scooter at the shop and it is ready”
   ‘P: I create my own scooter by myself”

2. CHANGE OF LOGIC

It is obtained by modifying usual order of events, time sequence, cause-effect relationships, semantic relationships, …

Es. 1 : “I look for the keys”
   ‘P: The keys look for me”

Es.2 : “During the trip I fill the scooter up”
   ‘P: During the trip, I ‘fill up’ too”
3. EXAGGERATION

It requires measures and dimensions: number, frequency, volume, temperature, duration…

It means suggesting a measure which is outside from usual range.

Es. 1: “Policemen have two eyes”
   **P**: Policemen have six eyes”

Es. 2: “Scooters present few colour variations”
   **P**: Scooters are colourless”

4. DREAM

It is obtained by expressing a fanciful desire which is impossible to realize.

Ex. 1: “The hull of a scooter can be scratched very easily”
   **P**: My scooter should always be brand-new”

Ex. 2: “Travelling by scooter is not very comfortable”
   **P**: My scooter is as comfortable as my car”
TECHNIQUES OF MOVEMENT

They allow your mind to move freely after a provocative statement in order to reach a useful idea.

1. Extracting a principle
2. Focusing on differences
1. EXTRACTING A PRINCIPLE

List meaningful characteristics from the subject of provocation.

Example: finding new means of communication for an advertising agency

<table>
<thead>
<tr>
<th>Provocation:</th>
<th>“P: Let’s go back to the town crier”</th>
</tr>
</thead>
</table>
| Movement: principles | • The town crier stays among people  
 | | • The town crier can modify his message according to the audience  
 | | • The town crier cannot be “turned off”  |
| Creative Idea: | You use public telephones free of charge and the conversation is interrupted by advertising messages |

2. FOCUSING ON DIFFERENCES

Compare differences between new (provocation) and old (reality) way of doing things.

Example: Create a scooter for middle-aged people

<table>
<thead>
<tr>
<th>Provocation:</th>
<th>“P: Scooters are as comfortable as cars”</th>
</tr>
</thead>
</table>
| Movement: differences | • Scooters may have heating  
 | | • Living spaces are wider  
 | | • Position is more correct thanks to a comfortable seat  |
| Creative Idea: | Wide loading rooms focused on one use (laptop, bottle rack,…). Mobile back that can also be used as a backpack. Adjustable seat. |
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CREATIVITY TEMPLATE

A STRUCTURED APPROACH TO CREATIVE PROCESS
AUTHORS OF THIS TECHNIQUE

Published for the first time in 2002

- **Jacob Goldeberg** (Hebrew University Jerusalem)
  works for Intel, Motorola, Mastercard,…

- **David Mazursky** (Hebrew University Jerusalem)
  world-famous Marketing expert

- **Sorin Solomon** (Hebrew University Jerusalem, Racah Institute)
  theoretic physicist
WHAT ARE CREATIVITY TEMPLATES?

- **4 ideative schemes** for a structured approach to innovation processes
- many new and successful ideas about products or services can be taken back to one of the templates
- a lot of well-known enterprises adopt this approach (e.g. Philips, Ford, Kodak, Coca-Cola, Motorola, exc.)

**EXAMPLE 1**

**Domino’s Pizza**: leader in home delivery. Its success derives from **reducing price** in case **time of delivery** is over half an hour.

Innovative element: **price of pizza is no longer constant**, but depends on delivery (step function).

New relation between price and a characteristic of the service
EXAMPLE 2

Wirefree (1999): mobile phone loudspeakers substituted by car loudspeakers

Advantages: sound quality (which depends on loudspeakers dimensions) increases significantly without any increment of cost

Substituting a product component with another available resource

Creativity Templates

1. Attribute dependence template

2. Replacement template

3. Displacement template
1. Attribute dependency template

1. Attribute

2. Replacement

3. Replacement

---

**Basic principles**

**Hypothetical case**

**Forecasting matrix**

**Application example**

---

**BASIC PRINCIPLES**

**identify 2 independent variables and create a new dependence between them**

the connection can be represented by a step function

\[
\begin{align*}
x \quad &\rightarrow \quad y \quad \text{y depends on x} \\
x, y \quad &\rightarrow \quad y \\
\text{independent variables} &\rightarrow \\
\end{align*}
\]
How to compete with Domino's Pizza?

Domino's pizza: price reduction in case time of delivery is over half an hour
Hypotetical competitor: Price as a dependent variable

Successful element: Adding a new dependence to pizza home delivery
Consequence: The consumer is less sensitive to delay in general (bet effect)

VARIABLES FOR A NEW DEPENDENCY

<table>
<thead>
<tr>
<th>Variable</th>
<th>Is it possible to add a new dependence by using this variable?</th>
<th>Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>pizza dimensions</td>
<td>no</td>
<td>price already depends on pizza dimensions</td>
</tr>
<tr>
<td>number of extras</td>
<td>no</td>
<td>price already depends on number of extra</td>
</tr>
<tr>
<td>adding a drink</td>
<td>no</td>
<td>this is a component and not a variable</td>
</tr>
<tr>
<td>temperature</td>
<td>yes</td>
<td>very important and measurable variable</td>
</tr>
<tr>
<td>past orders</td>
<td>perhaps</td>
<td>interesting variable; but there is often a dependency already between price and customer's habits</td>
</tr>
</tbody>
</table>
**CREATE Project**

**IS YOUR PIZZA STILL HOT AND TASTY???

1. Pizza is full price if it is over a certain temperature

   ![Temperature vs. Price Graph]

   **Marketing message:**
   pizza taste depends on its temperature and not on time delivery

**CREATE Project**

**LOOKING FOR NEW DEPENDENCIES**

1. How can we find Attribute dependence variables?

2. How can we evaluate the feasibility and profitability of a new idea?

   ![Question Mark]

   ... by using the **Forecasting Matrix**
HOW CAN WE IDENTIFY RELEVANT VARIABLES AND SEARCH FOR NEW DEPENDENCIES?

variable classification

Internal: under producer's control (pizza price, pizza temperature, car colour, ...)

External: in contact with product but not under producer's control (environment temperature, ...)

FORECASTING MATRIX

<table>
<thead>
<tr>
<th>Internal Variables</th>
<th>Price</th>
<th>Temperature</th>
<th>...</th>
<th>...</th>
<th>...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Var.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>0</td>
<td></td>
<td>0</td>
<td></td>
<td></td>
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<tr>
<td>...</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

| External Var.      |       |             |     |     |     |
| Weather            | 0     |             | 0   | 0   | 0   |
| Traffic            | 0     |             | 0   | 0   | 0   |
| ...                | 0     |             | 0   | 0   | 0   |
| ...                | 0     |             | 0   | 0   | 0   |

0 = not yet existent dependencies  1 = already existent dependencies
**Internal/External Variables Matrix**

<table>
<thead>
<tr>
<th>Internal Variables</th>
<th>Price</th>
<th>Line</th>
<th>Wheel Dimension</th>
<th>Dimension/Weight</th>
<th>Power</th>
<th>Colour</th>
<th>Feeding Type</th>
<th>Decorations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>X</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
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<tr>
<td>Line</td>
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<td>X</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Wheel dimension</td>
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<td>1</td>
<td>X</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dimension/Weight</td>
<td>1</td>
<td>1</td>
<td>X</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Power</td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>X</td>
<td>0</td>
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</tr>
<tr>
<td>Colour</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>X</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Feeding type</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>X</td>
<td>0</td>
</tr>
<tr>
<td>Decorations</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>X</td>
</tr>
</tbody>
</table>

**External Variables**

<table>
<thead>
<tr>
<th>External Variables</th>
<th>Price</th>
<th>Line</th>
<th>Wheel Dimension</th>
<th>Dimension/Weight</th>
<th>Power</th>
<th>Colour</th>
<th>Feeding Type</th>
<th>Decorations</th>
</tr>
</thead>
<tbody>
<tr>
<td>External temperature</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Visibility</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Driver's age</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
**CREATE Project**

**External Variable VISIBILITY: LOOKING FOR DEPENDENCIES**

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>IS IT POSSIBLE TO ADD A NEW DEPENDENCE BY USING THIS VARIABLE?</th>
<th>MOTIVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour/Decoration</td>
<td>YES</td>
<td>Make driving safer in case of bad weather</td>
</tr>
<tr>
<td>Wheel dimension</td>
<td>YES</td>
<td>Not interesting variable</td>
</tr>
</tbody>
</table>

**EXAMPLE: COLOUR/VISIBILITY**

A good idea could be to use a special paint or lighting devices in order to improve scooter visibility in adverse conditions.

---

**INTERNAL/EXTERNAL VARIABLES MATRIX**

<table>
<thead>
<tr>
<th>INTERNAL VARIABLES</th>
<th>EXTERNAL VARIABLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>X 0 0 1 1 0 1 1</td>
</tr>
<tr>
<td>Line</td>
<td>0 X 1 1 0 0 0 0</td>
</tr>
<tr>
<td>Wheel dimension</td>
<td>0 1 X 1 0 0 0 0</td>
</tr>
<tr>
<td>Dimension/Weight</td>
<td>1 1 1 X 1 0 1 0</td>
</tr>
<tr>
<td>Power</td>
<td>1 0 0 1 X 0 0 0</td>
</tr>
<tr>
<td>Colour</td>
<td>0 0 0 0 0 X 0 1</td>
</tr>
<tr>
<td>Feeding type</td>
<td>1 0 0 1 0 0 X 0</td>
</tr>
<tr>
<td>Decorations</td>
<td>1 0 0 0 1 0 X 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXTERNAL VARIABLES</th>
<th>INTERNAL VARIABLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>External temperature</td>
<td>External Visibility</td>
</tr>
<tr>
<td>Driver's age</td>
<td>0 0 0 0 0 1 0 1</td>
</tr>
</tbody>
</table>

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CREATE Project

External Variable TEMPERATURE: LOOKING FOR DEPENDENCIES

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>IS IT POSSIBLE TO ADD A NEW DEPENDENCE BY USING THIS VARIABLE?</th>
<th>MOTIVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line</td>
<td>YES</td>
<td>Make the trip more comfortable</td>
</tr>
<tr>
<td>Feeding type</td>
<td>YES</td>
<td>Reduce polluting emissions in summer</td>
</tr>
</tbody>
</table>

EXAMPLE: LINE / EXTERNAL TEMPERATURE

possibility to add a mobile dome that comes out from the frame and shields the driver in case of bad weather

INTERNAL/EXTERNAL VARIABLES MATRIX

<table>
<thead>
<tr>
<th>PRICE</th>
<th>LINE</th>
<th>WHEEL DIMENSION</th>
<th>POWER</th>
<th>COLOUR</th>
<th>FEEDING TYPE</th>
<th>DECORATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>X</td>
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<td>0</td>
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<tr>
<td></td>
<td>0</td>
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INTERNAL/EXTERNAL VARIABLES MATRIX

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<table>
<thead>
<tr>
<th>External temperature</th>
<th>Visibility</th>
<th>Driver's age</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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CREATE Project

Internal Variable VISIBILITY: LOOKING FOR DEPENDENCIES

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>IS IT POSSIBLE TO ADD A NEW DEPENDENCE BY USING THIS VARIABLE?</th>
<th>MOTIVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>NO</td>
<td>Price is already depending on power and engine</td>
</tr>
<tr>
<td>Driver’s age</td>
<td>YES</td>
<td>We push sales of this model among very young customers</td>
</tr>
</tbody>
</table>

EXAMPLE: AGE/PRICE
we want to link the scooter’s price with the driver’s age in order to attract a younger market target

2. Replacement template

Basic principles
Definitions
Operative prescriptions
Case study
**CREATE Project**

**BASIC PRINCIPLE**

1. **Attribute**

   Substituting a resource or a component existing in the system or in its immediate neighbourhood to satisfy a specific function

2. **Replacement**

   New component characteristics:
   - available in the local context
   - fulfil required function

**DEFINITIONS**

1. **Component**: autonomous part or subsystem (static object) both internal and external

2. **Link between two components**:
   - 1) Controlling component
   - 2) Controlled component

3. **Product configuration**: the whole links of the product
CREATE Project

OPERATIVE PRESCRIPTIONS

1. List **components**
2. Build **product configuration**
3. Choose an essential component and **remove** it from the configuration without removing its function
4. List external components physically or functionally **similar** to the excluded one
5. Connect each external component to the function lacking in component: **new configuration**
6. Look for a **new market advantage**

CASE STUDY: A CHAIR (1/4)

1a. **Internal** components: legs, seat, back
1b. **External** components: floor, wall, user

2. Chair configuration:

- Essential components
CASE STUDY: A CHAIR (2/4)

3. Component elimination (without removing its function)

- Physical model
- Intermediate chair configuration

CASE STUDY: A CHAIR (3/4)

4. Individuation of a component similar to the missing one

Criteria:
- external
- In contact with product
- Physically or functionally similar to missing component

Possible solutions: wall, table, carpet, user, floor
Substitutive component: table (design and functional similarity)
5. New product configuration

(a) New chair configuration

(b) Physical model

6. New Advantages:
- Children may sit at the appropriate height in relation to the table
- Easier to transport and to clean

3. Displacement template

Basic principles

Operative prescriptions

Example
BASIC PRINCIPLE

1. It is a variant of the previous template.

2. It excludes an intrinsic component and its functions from product configuration.

3. Replacement

OPERATIVE PRESCRIPTIONS

1. List internal and external components

2. Build product configuration

3. Choose an essential component and remove it from the configuration together with its function

4. Look for a new market advantage
**EXAMPLE: A CHAIR**

![Diagram of a human body with a chair](image)

(a) New chair configuration

(b) Physical model of the new chair

Chair’s leg function is not satisfied and the chair is on the floor

**New Advantages:** high stability (very useful on the beach)

---

**CONTACTS:**

Alberto F. De Toni: detoni@uniud.it
Alessandro Bonanni: alessandro.bonanni@uniud.it
Mauro De Bona: m.debona@innova-eu.net
SIX THINKING HATS

A COLOURED TECHNIQUE FOR EVALUATION
Are you really the same person if you wear different hats???

Author of the technique: E. De Bono (1985)

HOW WE THINK...

- Different ways of thinking:
  - information
  - logic
  - emotions
  - desires
  - creativity

- We think in different ways simultaneously, often generating confusion
  Ex.: we look for a logical excuse for emotions
CREATE Project

6 HATS = 6 WAYS OF THINKING

Rational

Organizational

Optimistic

Pessimistic

Creative

Emotional

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WHY... SIX HATS?

✓ To play a part
   (if you wear a clown’s dress, you can behave like a clown!)

✓ To protect yourself
   (you can freely express your EMOTIONS!)

✓ To pay attention
to every aspect of a problem

✓ To change your register
   (stop being pessimistic!)

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**BASIC RULES**

1. **WHITE:** *Absence* of colour... neutrality, data, numbers, facts, information
2. **RED:** like *Passion*!... emotions, sensations, premonitions, intuitions
3. **BLACK:** like *Thunder*!... negative aspects, risks, problems
4. **YELLOW:** here comes the *Sun*!... positive aspects, constructive attitude, opportunities
5. **GREEN:** like *Grass*... fertility of thoughts, new ideas, creativity
6. **BLUE:** like the *Sky* above us... supervision, control, direction

---

**BASIC RULES**

- “Let’s put the white/red/black/yellow/green/blue hat on”
- No more exhortations or reproaches
... like a **COMPUTER!!**

Data, numbers  
Information

Real things  
Things said by others

---

**WHITE HAT**

"Let's put the white hat on"

- NO interpretations
- NO opinions
- Precise and specifique questions
- 2 levels of information:
  - controlled facts
  - believed facts
THE RED HAT

... like PASSION!!

Do you see red?
Emotions & sensations
Premonitions
Intuitions

“Let’s put the red hat on”

✓ Reactions & concerns
✓ NO justifications
✓ NO need to explain reasons
✓ Visible sensations

Two categories:

1) common emotions (fear, aversion, suspicion)
2) premonitions, impressions, aesthetic regards
...like **THUNDER!!**

Devil’s advocate
Negative judgments

Why isn’t your idea good?

---

**THE BLACK HAT**

"Let’s put the black hat on"

- critical judgment
- pessimism

**STEPS:**
1) is the premise valid & well-grounded?
2) is the consequence correct?
3) is the consequence necessary?
4) is it possible to find other consequences (or conclusions)?
THE YELLOW HAT

...like the SUN!!

Brilliance, luminosity
Optimism

Opportunity
Positive logical judgments
(not emotional)

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"Let’s put the yellow hat on"

✓ advantages (gain & benefits)
✓ towards positive results (efficiency & feasibility)
✓ concrete and precise suggestions
✓ prediction about the future
✓ dreams & fancies
THE GREEN HAT

...like **GRASS!!**

Fertility, creativity  Movement, provocation
Plant from the seed  Random words

"Let's put the green hat on"

- NEW ideas, concepts, perceptions
- NEW approaches to problems
- change
- alternatives & options
- lateral thought
- humour
- beyond what is well-known
"Let's put the blue hat on"

- instructions to think
- organization of thought
- control & respect of the rules
- right questions
- define the problem
- define the targets
- explorative questions
- summaries, conclusions, data, ...
Application to a DERBI product

IDEA:
Hide the scooter’s silencer from sight by inserting the exhaust pipe into the tail

Evaluation with the six thinking hats method
WHITE hat

The idea consist into combining the exhaust pipe into the tail like GP motorbikes.

YELLOW hat

- aesthetic improvement
- More safety owing to the elimination of accidental burns due to contact
BLACK hat

- Difficult maintenance for the exhaust pipe
- Less room for the carrier under the seat
- Heavy heat insulation needed between pipe and plastic

GREEN hat

- Build a more compact exhaust pipe
**RED hat**

- power
- aggressiveness
- desire to be the centre of attention
- desire of possession
- ...

**BLUE hat**

Overall this idea seems good:
- apparently there are no big technical issues
- it stirs up mostly positive emotions
- problems pointed out by the black hat are not insormountable
CONTACTS:

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