Brand identity in design of industrial product

Martin Ondra,
mentor: doc. Ing. arch. Jan Rajlich
Institute of Machine and Industrial Design
Faculty of Mechanical Engineering
Brno University of Technology

Defence of dissertation thesis
11th October 2017
Motivation

- To know more
- How to design a product for brand identity
- Process of innovation
- Search for brand (own) identity

Timeline of Coca-Cola bottles.
Source: urbanpeek.com

Defence of dissertation thesis
Content

- Current state of the art
- Aim of the thesis
- Materials – the Brand
- Brand analysis – Logo and colours
- Brand analysis – shapes
- Shape grammars
- Discussion
- Interview with Miloslav Šindler
- Conclusion
What is this Brand identity?

- Brand identity is a sum of desired properties’ associated with the brand, these are to be given and cared for by the company planners [1]
- Branding is the process of creating such own definition for a specific brand or a product [1]
- Every company has its identity whether it recognizes or not [2]
Brand and the design

Product design is part of the brand identity and therefore it communicates this identity to customers [3][4]

When recognized, precise identity contributes to success of the brand

According to Karjalainen product communicates the identity on 3 levels:

• Directly – logo, shape of the hood
• Qualitatively – design elements defined on long term basis
• Non-directly – experience based messages

Colours in the identity

• Effect the brand personality [5]
• Depending on the market, colour differentiation is advantage or disadvantage [6]

Defence of dissertation thesis
Current state of the art

Decomposition

- Decomposing to levels of features – Outline, Inner holes, Muscles, Graphics, explicit details
- Despite the visual representation of the vehicle is in high abstraction, yet the brand can still be identified.
- More difficult to identify vehicle category than the brand [7]

Layers of vehicle decomposition

Source: [7]
Method for exploring similarities

- Presented by Ranscombe et al. [8]
- Exploring in proportion, orientation and shape
- Products from or outside of group can be compared
- Based on curves from decomposed features and their centroids
- Degree of similarity shows relative similarity

Examples of shapes and their respective analysis

Source: [8]
Shape grammars
Firstly presented by Stiny and Gips [9] generative technic for creating good art objects and the understanding development of what creates the good art objects.
Based on language grammars

Every grammar consist of 4 sets
- Set of end shapes
- Set of markers
- Set of rules
- Initial shape
Current state of the art

Example of simple shape grammar (left) and example of rule application with generated results (right)

Source: [9]
Current state of the art

Shape grammars in design

- Language of Coffee makers [10]
- Generating Buicks [12]
- Generating Mini [13]
- Shape grammar tools [14][15]

- No study comparing the design process to shape grammars
- Shape grammars can generate only combinations of elements given in the start.

Generated front masks with Buick shape grammar

Source: [12]
Aim of the thesis

State of the art
- Every brand has identity
- Key similarities form brand identity
- Shape grammars work with combination of these similarities
- No one compared designing process and innovation to computation
- Design is important for brand identity on the competitive market

Interests
- Define existing identity to help the brand
- Learn how to design for brand identity
- Improve shape grammar to be more useful to designers

Aims
- Gather materials and knowledge
- Design two concepts non/generatively
- Analyse the brand for similarities and try to find out what forms the identity
- Try to generate designed concept with shape grammars
- Conclude what happened during the innovation
Materials

NAREX brand

• Developed from Siemens factory for corded tools, built during WW 2
• Firstly production of licensed tools from other brands (Siemens)
• Nowadays part of concern TTS Tooltechnic Systems AG & Co
• Producing range of electric tools for professionals with emphasis on quality and reliability

Picture from NAREX museum, located in Česká Lípa
Materials

NAREX products
For thesis, 2 cordless drills, 5 angle grinders, 5 corded drills and 1 corded screwdriver from current and past product lines were photographed

Products photographed in 5 views
All products were decomposed to lines using Rhinoceros 5.0 software, and scaled 1:1, chuck and jaws were not included for analysis

Products
- ASV18-2A, CZ 47037
- EBU018A, EBU 12, EBU13-14CE, EBU15F, EBU15-16CA
- E403II, EC513D, EVP13E-2H3, EVP13C-2H3, EVP13H-2C
- EŠ 312D

Decomposed EC 513D and its photo
Iconic product of NAREX brand from 1970’s. In several households it still serves to nowadays.
Materials

Products of NAREX brand, available for analysis
Top line – drills
Middle line – screwdriver, cordless drill
Bottom line – angle grinders
(authors photography)
My design

- Design of electric tools as an experiment without knowledge from following analysis
- Emphasis on brands iconic EC 513D
- Better vibration control
- Designed only as a visual concept for the needs of the thesis
- Designed concepts were decomposed in same way as NAREX products for further analysis

Designing method

1. Specification of the problem
2. Analysis of current market, technical aspects
3. Sketches
4. Final concept

Defence of dissertation thesis
Materials

New drill concept
Created with emphasis on vibration reduction.
Materials

New angle grinder concept
Created with emphasis on vibration reduction.
NAREX logo

- Official, registered logo from around 1956
- Unchanged logotype, no evolution of the logo
- Logos from the segment are similar
- Market segment uses logotype and simple lines
- Concept – uses just the logotype without rectangle

Old and current logo of brand NAREX
(source: upv.cz)
Tried to find whether there are any colour norms in studied range of products.

Method for estimate is based on coloured area from 3 views.

No certain norm found in use of the 4 brand colours,

Modern corded tools use 32% ± 4% of gray colour.

Orange control elements

Black rubber „natural“ colour

<table>
<thead>
<tr>
<th>Product</th>
<th>% of BLUE</th>
<th>% of ORANGE</th>
<th>% of GRAY</th>
<th>% of BLACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASV18-2A</td>
<td>30,648</td>
<td>2,004</td>
<td>4,064</td>
<td>63,283</td>
</tr>
<tr>
<td>CZ47037</td>
<td>61,296</td>
<td>1,954</td>
<td>0,000</td>
<td>36,750</td>
</tr>
<tr>
<td>E603II</td>
<td>0,000</td>
<td>0,000</td>
<td>98,013</td>
<td>1,987</td>
</tr>
<tr>
<td>EBU018A</td>
<td>0,000</td>
<td>0,000</td>
<td>70,991</td>
<td>29,009</td>
</tr>
<tr>
<td>EBU12</td>
<td>59,055</td>
<td>1,875</td>
<td>25,440</td>
<td>6,199</td>
</tr>
<tr>
<td>EBU13-14E</td>
<td>57,378</td>
<td>2,579</td>
<td>37,168</td>
<td>2,875</td>
</tr>
<tr>
<td>EBU15F</td>
<td>31,949</td>
<td>0,724</td>
<td>36,649</td>
<td>30,679</td>
</tr>
<tr>
<td>EBU15-16CA</td>
<td>27,672</td>
<td>4,866</td>
<td>35,793</td>
<td>31,668</td>
</tr>
<tr>
<td>EC513D</td>
<td>61,033</td>
<td>0,000</td>
<td>36,170</td>
<td>2,797</td>
</tr>
<tr>
<td>ES312D</td>
<td>0,000</td>
<td>63,812</td>
<td>30,135</td>
<td>6,053</td>
</tr>
<tr>
<td>EVP13E-2H3</td>
<td>59,693</td>
<td>8,375</td>
<td>31,626</td>
<td>0,306</td>
</tr>
<tr>
<td>EVP13H-2C</td>
<td>45,448</td>
<td>6,300</td>
<td>28,850</td>
<td>19,402</td>
</tr>
<tr>
<td>EVP13C-2H3</td>
<td>60,815</td>
<td>4,218</td>
<td>34,968</td>
<td>0,000</td>
</tr>
<tr>
<td>Average</td>
<td>38,076</td>
<td>7,439</td>
<td>36,143</td>
<td>17,770</td>
</tr>
<tr>
<td>Average drill</td>
<td>56,747</td>
<td>4,723</td>
<td>32,903</td>
<td>5,626</td>
</tr>
<tr>
<td>New drill concept</td>
<td>44,855</td>
<td>6,630</td>
<td>24,639</td>
<td>23,876</td>
</tr>
<tr>
<td>Average grinder</td>
<td>35,211</td>
<td>2,009</td>
<td>41,208</td>
<td>20,086</td>
</tr>
<tr>
<td>New grinder concept</td>
<td>41,523</td>
<td>1,533</td>
<td>25,995</td>
<td>30,949</td>
</tr>
</tbody>
</table>

Defence of dissertation thesis
Concept vs the brand

**Brand products**
- Logo in rectangular format, blue background
- Blue and gray colour, with orange controls and black rubber parts

**New concepts**
- Only logotype without blue, black background
- Blue and gray colour, with orange controls and black rubber parts
Outline proportions
Using standard deviation as limit for the brand
Measuring areas of respective features
Proportion analysis

Engine area - side views

Logo area side views

Defence of dissertation thesis
Proportion analysis

Silhouette area - top view

Gearbox area - top view

Defence of dissertation thesis
**Concept vs the brand**

**Brand products**
- Logo in rectangular format, blue background
- Blue and gray colour, with orange controls and black rubber parts
- No certain relation in proportion between analysed products

**New concepts**
- Only logotype without blue background
- Blue and gray colour, with orange controls and black rubber parts
- Similar proportions to last products in same segment
Orientation analysis

Serves for analysis of minimal and maximal distance of certain feature from outline centroid

Reflects mainly the construction and part positions between the products
Orientation analysis

Engine feature orientation – top view
(authors visualization)
Orientation analysis

Control switch feature orientation, side view
(authors visualization)
Orientation analysis

Brake and speed buttons orientation, top view
(authors visualization)
Concept vs the brand

Brand products
- Logo in rectangular format, blue background
- Blue and gray colour, with orange controls and black rubber parts
- No certain relation in proportion between analysed products
- Orientation analysis show similar arrangement of parts. Brake buttons of grinders are placed inconsistently
- Better orientation similarity in drills/grinders category

New concepts
- Only logotype without blue background
- Blue and gray colour, with orange controls and black rubber parts
- Similar proportions to last products in same segment
- Parts arranged similarly to existing products
Shape analysis

Shape analysis of all silhouettes

Radial length

Points on outline

- ASV 18 - 2A
- CZ 47007
- E 603 II
- EB 018 A
- EBU 12
- EBU 13-14 E
- EBU 15 F
- EBU 15-16 CA
- EC 513 D
- EŠ 312D
- EVP 13 E-2H3
- EVP 13 H-2C
- EVP 13C-2H3
- New drill
- New grinder
- Average

Defence of dissertation thesis
Shape analysis

Shape of logo features

- ASV 18 - 2A
- CZ 47007
- EBU 12
- EBU 13-14 E
- EBU 15 F
- EBU 15-16 CA
- EC 513 D
- EVP 13 E-2H3
- EVP 13 H-2C
- EVP 13C-2H3

Defence of dissertation thesis
Shape analysis

Muscle curves of selected products

Defence of dissertation thesis
Shape analysis
Shape analysis

Muscle curves of selected products and new concepts

- EBU 12
- EBU 15 F
- EBU 15-16 CA
- EC 513 D
- EVP 13 E-2H3
- EVP 13C-2H3
- New drill
- New grinder

Defence of dissertation thesis
Shape analysis

Silhouette similarity of modern angle grinders

Radial length

Points on outline

Range New grinder – Average

Defence of dissertation thesis
Concept vs the brand

Brand products
- Logo in rectangular format, blue background
- Blue and gray colour, with orange controls and black rubber parts
- No certain relation in proportion between analysed products
- Orientation analysis show similar arrangement of parts. Brake buttons of grinders are placed inconsistently
- Better orientation similarity in drills/grinders category
- Shape similarities in logo feature and several other features (muscle curves)
- EVP 13H-2C deviating from other brand products

New concepts
- Only logotype without blue background
- Blue and gray colour, with orange controls and black rubber parts
- Similar proportions to last products in same segment
- Parts arranged similarly to existing products
- Concepts not similar in shape of logo feature
- Drill concept partly similar to muscle to EC513D
- In outline the new concepts are out of range of brand products in few areas

Defence of dissertation thesis
### Degree of similarity

#### Similarity score of new drill concept

<table>
<thead>
<tr>
<th>Degree of similarity</th>
<th>Silhouette</th>
<th>Gearbox</th>
<th>Engine</th>
<th>Handle</th>
<th>Muscle</th>
<th>Main switch</th>
<th>Logo</th>
<th>Venting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion</td>
<td>0.409</td>
<td>0.053</td>
<td>0.003</td>
<td>0.424</td>
<td>0.971</td>
<td>0.355</td>
<td>1.496</td>
<td>0.167</td>
</tr>
<tr>
<td>Orientation (mean)</td>
<td>N/A</td>
<td>0.664</td>
<td>0.18</td>
<td>0.512</td>
<td>0.236</td>
<td>0.198</td>
<td>0.554</td>
<td>0.347</td>
</tr>
<tr>
<td>Shape (mean)</td>
<td>0.267</td>
<td>0.221</td>
<td>0.199</td>
<td>0.987</td>
<td>0.561</td>
<td>0.34</td>
<td>1.699</td>
<td>0.36</td>
</tr>
<tr>
<td>Average</td>
<td>0.338</td>
<td>0.312</td>
<td>0.127</td>
<td>0.641</td>
<td>0.589</td>
<td>0.297</td>
<td>1.25</td>
<td>0.291</td>
</tr>
</tbody>
</table>

#### Similarity score of new angle grinder concept

<table>
<thead>
<tr>
<th>Degree of similarity</th>
<th>Silhouette</th>
<th>Gearbox</th>
<th>Engine</th>
<th>Handle</th>
<th>Muscle</th>
<th>Main switch</th>
<th>Logo</th>
<th>Venting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion</td>
<td>0.256</td>
<td>0.215</td>
<td>0.244</td>
<td>0.302</td>
<td>0.421</td>
<td>0.186</td>
<td>0.187</td>
<td>0.85</td>
</tr>
<tr>
<td>Orientation (mean)</td>
<td>N/A</td>
<td>0.17</td>
<td>0.688</td>
<td>0.369</td>
<td>0.317</td>
<td>0.535</td>
<td>0.989</td>
<td>1.316</td>
</tr>
<tr>
<td>Shape (mean)</td>
<td>0.294</td>
<td>0.502</td>
<td>0.228</td>
<td>0.306</td>
<td>0.924</td>
<td>0.264</td>
<td>0.934</td>
<td>0.677</td>
</tr>
<tr>
<td>Average</td>
<td>0.338</td>
<td>0.312</td>
<td>0.127</td>
<td>0.641</td>
<td>0.589</td>
<td>0.297</td>
<td>1.25</td>
<td>0.291</td>
</tr>
</tbody>
</table>

**Defence of dissertation thesis**
Shape grammar

Generally
Shape grammar created for NAREX drills.
Consists of 57 rules
Can be enhanced by adding rules for grinders
Initial shape – engine, represented by rectangle with markers

Rules
● Rules for back (1-10) and front of the handle (11-26)
● Rules for joining element (26-35) and gearbox (36-47)
● Rules for vents, logos (48-54) and muscles (55-57)

Defence of dissertation thesis
Shape grammar rules

Complete rules in thesis on pages 86-89

Rules for the back of the handle

Rules for ventilation and logo
Shape grammar verification

Verification has been conducted by generating all parental products.

<table>
<thead>
<tr>
<th>Product</th>
<th>Rules needed</th>
<th>Shared rules with</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>EC 513D</td>
</tr>
<tr>
<td>EC513D</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>EVP 13C-2H3</td>
<td>19</td>
<td>10</td>
</tr>
<tr>
<td>EVP13E-2H3</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>EVP13 H-2C</td>
<td>24</td>
<td>4</td>
</tr>
</tbody>
</table>

Table of rules shared and needed to generate parental products

Parental products generated with shape grammar
Left top – EC 513D, Right top - EVP 13-2H3
Left bottom – EVP 13E-2H3, Right bottom - EVP 13H-2C

Defence of dissertation thesis
Generating manually to have concept principally similar
Rules applied 1, 5, 8, 11, 16, 14, 20, 22, 27, 30, 33, 36, 45, 39, 40, 42, 49 and 54
Muscle curves cannot be applied
Switches, rubber backing can be generated
Dissimilarities in gearbox switch, top and side of engine compartment

Places to be redesigned according to shape grammars
Left – generated concept
Right – decomposed concept with marked places
Brand identity of NAREX

- The identity is reflected in products by consistent use of logo and 4 brand colours
- Furthermore it is bolstered by muscle curves at EC 513D, EBU 12, EBU 15F and EBU 15-16CA with derivated muscle curves on EVP 13E-2H3
- There cannot be a statement that a product produced by NAREX is not part of its identity, with exception of E603II (drill was in licensed manufacturing). - From this point of view the new concepts are not belonging to the brand
- Every identity is less or more defined, degree of similarity can be a guide for this, perhaps even possible variable to measure Brand performance in design

Innovation of products within the identity

- Complex process driven by different needs than „just a new shape“
- Innovated design always used elements from past products but added several new – new concepts could belong to brand identity
- Hypothesis: Brand identity grammar + Innovation grammar = Innovated design
- This could help to adapt shape grammars to be a better tool for designer
Interview with Miloslav Šindler

Interview for further comparison of the designing process and description of the innovation

**Interesting points from interview**

- Opinion that there are no typical NAREX shape elements, and they fortunately weren’t given to maintain for design
- Colours were given to maintain, as was the company label
- He does not take inspiration and neither have thought of designing elements that would be systematically kept along the product line

Clearly according to interview, the designing process is much more complicated that any previous research may show. Variables are making every product unique

Sketching took less than 2 months and it is hard to tell whether a shape grammar tool could speed up the process.

 Defence of dissertation thesis

Examples of tools designed by Miloslav Šindler

Corded hammer – top
Corded drill - bottom
(Source: asociacedesigneru.cz)
Conclusion

Thesis achievements

- Gathered data and knowledge about brand identity
- Two concepts were designed without computer support for the study – similar to brand products
- NAREX brand identity was analysed for similarities with conclusion and recommendation for being more consistent
- NAREX drill shape grammar, made of 57 rules was designed
- Concepts were compared to see if they fall to brand identity and places for possible redesign were identified
- Conducted interview with Miloslav Šindler brought further insight

This work has brought a different point of view on studying how the innovation works in relation to shape grammar rules and similarity. It compared the actual designer’s work and the shape grammars to find a hypothesis to make the shape grammars closer to the designers.
Thank you for attention

Martin Ondra
101172@vutbr.cz
martin.ondra87@gmail.com

http://uk.fme.vutbr.cz/
References


Defence of dissertation thesis
References


Is the old approach to the designing of designers based on the work of one designer - the master of his craft, using his intuition in the shape of similarity between the proposed items of one brand as effective as the new method which is presented by doctoral candidate in his work?

Depends on point of view. It is a tool that has its advantages and disadvantages. If the brand wishes to remain strict, it might be better for it to stay within rules and use computation tools when necessary. However, such approach may limit creativity and evolution of the brand. Computational methods that are available at this time cannot compete with superior creativity of master of the craft.

In the end its always up to the brand, what it wants to say with their design.
Question from review
Question from review
Question from review