

Peter Papp

## MASS CUSTOMISATION IN DESIGN

The ideal situation and the essential goal of designers and customers are to obtain a unique product, which can fulfil all individual wishes. Is this possible with today's level of technology?

At the end of the 19th century, the Industrial Revolution raised many design problems. Mass production became the main production method - with quality and design that characterised technologies of that time. There had also been some attempts to return back to hand-made production, for example Ruskin's "Arts and Crafts" <sup>(1)</sup>

The major work "Mechanisation takes Command" <sup>(2)</sup>, about the impact of mechanisation on people by Sigfried Gideon, was written in 1948. In the book he tries to understand the changes in the society of the time. There is a detailed study of penetration into most areas of human life.

In the past, production cycles were lengthy, and design cycles also lasted a relatively long time. This situation has changed. The information age brings the possibility of integration. We are living in "just-in-time" society, of "one-to-one" business. The process of mechanisation is continuing in the current process of computerisation and digitisation. Knowledge is becoming computerised. Previous means and methods of acquisition, communication and criticism of knowledge are being replaced by inquiry, dissemination, and evaluation carried by digital means. <sup>(3)</sup>

Mass Customisation aims at providing goods and services that best meet individual customers' requirements with near mass production efficiency. New methods of work, new technologies and different thinking have also found their way into the theory of design. There are new possibilities for modelling and testing design hypotheses with the help of computers.

In the book *Mass Customisation: New Frontier in Business Competition* <sup>(4)</sup> written by Joseph Pine, the author describes the factory system of mass production that emerged in the

19th century. He describes it as a system characterised by specialised machines, interchangeable parts, a skilled workforce and continuous technological improvement.

In the following years, from the beginning of the 1960's to the 1980's, Pine characterises unstable and unpredictable demand levels as heterogeneous desires, price, quality and style consciousness, a high level of buyer ability, competitive intensity and product differentiation.

A number of companies in electronics, in the automobile industry and in industrial services have successfully transferred some of their business to true mass customisation. Using creative and inventive possibilities they have been moving from mass production to mass customisation.

Web-based collaboration solutions provide manufacturers with the ability to offer their customers a choice of product customisation, based on existing engineering information created by flexible engineering solutions. With customer-tailored product initiatives, manufacturers are able to support increased customer loyalty.

In reaction to this changing market situation, the Jeans manufacturer *Levi Strauss* has established a program for customisation and body-measurement collecting called "personal pair". Their goal was to create a unique sale proposal for customers - individually tailor-made jeans - for a price not much higher than for regular jeans. <sup>(5)</sup>

Collecting human-body measurements will cause a synergetic effect in the ergonomics. Body measurements used by designers have not changed since the 50s, but the average weight has increased by about 10 percent since 1950. <sup>(10)</sup>

Companies in all sectors are scrambling to meet this challenge - sport articles, medical equipment, services, cars, toys and information - from Mattel to Nike, from Levi's to Saturn. New



companies are emerging each day that aim to capitalise on this new trend. <sup>(6,7)</sup>

Also, the CAD market with tools for designers has changed. What used to be called "hi-end CAD" is no longer the primary focus of companies. It has been supplanted by enterprise systems and data management. At the same time, companies like SolidWorks or Solid Edge are offering sophisticated solid modelling software at a "friendly" price. The result of this business competition is advanced CAD solutions with knowledge-based engineering and design – PTC's "Behavioural Modelling", Unigraphics' "UG/Wave" or IBM/Catia's "Knowledgeware". All these systems allow the user to specify functions and generate variants automatically and extremely quickly to fulfil all individual requirements.

More and more people are starting to think about the Internet (with its interactivity) in association with the global market. It is a big challenge for manufacturers as well as designers.

Interaction is also starting to be a "natural" way of communication in art. Here are some examples: Blonski's "Random Pictures" <sup>(8)</sup> or Max Dean's art-installation demand active cooperation from the observer. Ilona Nemeth's art-installation transforms the onlooker into an actor. Hypertext gives the reader freedom of choice.

In the book *"Globalisation: Crossroads of Civilization"* <sup>(9)</sup> written by Milan Šikula, the author explains the extent of changes in today's global economy. In this "megacompetition", the Internet allows manufacturing companies to link up with suppliers and customers to build a better product and to build those products faster. The author offers some solutions as to how to do this: flexible engineering, global services and behavioural modelling. He also describes several risks, and social, economical and ecological aspects.

In my project, I to design a simple product, which can be customised by its user. I will define my own domain for research and development using all the possibilities of mass customisation and computerised design.

In the theoretical part of my work, I will present an abridged history (from an industrial

designer's point of view), current trends and possibilities, and finally, my own solution for mass customisation.

My goal is a product that can be produced within the technological limits of a small company. This model uses a different data distribution system, which is acceptable for both sides (the manufacturer and the copyright owner).

For example: the bicycle manufacturer and distributor can provide different models from different design companies via the Internet without owning an expensive advanced CAD system. This system will add distribution service and a guarantee for the user. The distributor could also operate consistent data collecting.

My project will consist of several different parts. First, there is data collecting from the user through an interactive interface (web page). This part will include the prototype for an interactive interface between the customer and the manufacturer for easy "product configuring" - without the user's detailed knowledge of the problem and with regard to the user's age and experience.

How to get the "ideal" interface?

Clemens Lango in his text "Interaction structures as a challenge to designers" <sup>(11)</sup> wrote about several problems of interaction. He describes these problems in examples, but the same applies to all aspects of interaction and design.

"Why is one interface easy to operate and another not?" he asked.

He presents a car radio with "amazing" functions and buttons as an ideal example of bad and complicated interface design.

In the era of electro-mechanical products, interface was not as important as it is today. Then there were usually few easy operating elements specific to a product.

The situation changed in the 80s. The development of electronics enabled new functions. The main trend had the formula "more functions=better performance=higher price" and a lot of products were made with a poorly structured and complicated interface.

Today's products are very complex. Interfaces are being transformed into software interfaces with a display screen. New interface problems concerning badly structured



information are similar to the badly structured information and chaotic user-interface on the Internet. One major task will be to design these interfaces in accordance with the needs of users of different ages with different experiences.

"Who is responsible for solutions to these future tasks?" Lango asked, "industrial designers, communication designers or software ergonomists?"

Lango describes his seminars with students, and provides some basic principles for good usability of interfaces, which link in with my theme.

In the second part of my project, a "behavioral" model will automatically transform data (antropometric data), compute and prepare data for CNC machines (frame geometry) and generate data for visualisation. This part is "invisible", but most importantly the designer must define a detailed description of all references and relationships between each part and detail. This description will establish all limits for customer intervention or collaboration. The computer will automatically generate an individual design within these bounds.

This procedure (for a bicycle) is also applicable in several different designs. My work will describe this different procedure of work in design.

The final text will be published in hypertext form, since this form is suitable for this kind of theme "in progress", with links to manufacturers, interesting solutions and information.

### References:

- 1) Morris: Lectures on Socialism, mentioned in the book: Hnutí umeleckých remesel, Praha, 1994
- 2) Sigfried Giedion: Mechanization Takes Command, a contribution to anonymous history, Oxford University Press, New York 1948
- 3) Mihai Nadin: Design in the Age of Knowledge Society, FormDiskurs 2,1/1997
- 4) Joseph Pine: Mass Customization - New Frontier in Business Competition, 1993
- 6) [www.getCUSTOM.com](http://www.getCUSTOM.com)

5) [www.levi.com](http://www.levi.com)

7) examples: [www.flashradio.com](http://www.flashradio.com),  
[www.cnn.com](http://www.cnn.com)

8) [http://www.ui42.sk/loser/shocking/random/random\\_s.htm](http://www.ui42.sk/loser/shocking/random/random_s.htm)

9) Milan Šíkula: Globalizácia - rázcestie civilizácie, Sprint 1999, Bratislava

10) Dave Katz: Size Matters - I.D. magazine, March/April 1999

The author describes the "CAESAR" initiative for collecting and distributing measures of the human body. The "CAESAR" will measure 11.000 volunteers from several countries by the new millennium.

11) Clemens Lango: Interaction structures as a challenge to designers - FormDiskurs 6 1/1999. He is the author of "low-fidelity prototyper", a software for easy creation of interface prototypes.



Contemporary challenge of design practise is the interpretation of design by design. It is the design approach that is being used more often, but at the same time it creates many questions for designers to answer.

After a couple of years of production of one generation of cars (usually 6-8 years), a new model is introduced. The new model very often accepts characteristic forms and design solutions from the precursor.

I will illustrate the interpretation of design by design on automotive design.

### Car

The interpreted object will be a car. It is a symbol and a product of the time. Drawing from the design philosophy of previous models is generally accepted.

### Architecture and morphology of a car

Morphology and formal evolution of a car have recently become the object of analyses of the Milan School of Aesthetics. The following terms have been developed: language and speech of automotive forms, shape evolution, typology of shapes. (3)

### Corporate identity

It is the next important feature of interpretation of a car. *Corporate identity* distinguishes design of vehicle producers. It is a very powerful generator in the development of a car design.

### Automotive advertising

Advertisement is a one-way communicative strategy that exists between a seller (producer) and a buyer. Sophisticated car advertisement directly matches a producer (trade mark) with a consumer identity and his lifestyle.

### Interpretations of a car

Reinterpretation of a previous successful model is very tempting for every vehicle producer who has had enough charismatic models. The simplest way to derive positive feelings and nostalgia is to borrow a feature from the past. Sometimes it is only a partial quotation or a redesign. I will only consider the new successful interpretations that have their fans – the customers.

The introduction of a NEW BEETLE concept in 1994 was the first succesful example of an interpretation of a car. At the Detroit Show in January 2001 the VW Microbus was launched. It is Volkswagen's updated reinterpretation of the Fifties

van that became a cult object, and the company's official statement is as follows: the Volkswagen designers created a vehicle which was a conscious new interpretation of the style elements of past VW Bus generations. It also revived the memories of American hippie movement and the feelings of freedom.

The British MINI COOPER started to be produced after 40 years in a new version. It is not a modern retro but it is contemporary interpretation of a legend. The producer explains: on the one hand, the car has elements reminiscent of the old Mini Cooper, and yet, on the other, it presents, from almost every point of view, the highest standards of technology available in this segment today.

The next part of the work will examine and analyze three vehicle producers: Alfa Romeo, Citroën and Jaguar. The analysis will contain producers' history, their design and new interpretations of the previous models.

### Conclusion

The thesis reviews artistic and historical interpretations and their use in design. In my work I will mainly use semiotical and hermeneutic methods for interpretations.

The aim of the next part of the thesis is to sort out the issues of artistic interpretations and to find all possible solutions from the arising problems. Next step will be to add case studies and the research paper will be sent back to design studios, where it will be considered, discussed and evaluated. The result of the work will be a deep analysis of the interpretation process. It will as well contain a designer's and a design theoretician's point of views which may create very attractive outcomes for contemporary practice.

### Sources:

1. BÜRDEK, B. E.: Design. Geschichte, Theorie und Praxis der Produktgestaltung, DuMont, Köln 1991
2. CARMAGNOLA, F.: *Towards a morphology of the car*, DOMUS 777, December 1995
3. Ed. GERŽOVÁ, J.: Slovník svetového a slovenského výtvarného umenia druhej polovice 20. storočia, Bratislava, Profil 1999
4. KARMAŠIN, H.: *Cultural Theory and Product Semantics*, FORM 2/1996
5. PETRÁNSKY, L.: *Kontext a forma - Limity a možnosti semiotiky pri interpretácii dizajnu*, In: DE SIGNUM 3/1996



**Notes:****(1) interpretation**

1. an explanation of the meaning of another artistic or creative work

2. the rendering of a dramatic part, music, etc.; indication of one's particular conception

(2) the division was taken from the syllabus of *Methods of interpretation of art works*

(3) CARMAGNOLA, F.: *Towards a morphology of the car*, DOMUS 777

**interpretation –**

1. výklad, vykladanie

2. umelecká interpretácia stvámenie

3. popularizačná činnosť, popularizácia

4. analýza, vyhodnotenie

**interpretation n. interpretational adj.**

1. the act of interpreting; elucidation; explication:  
*This writer's work demands interpretation.*

2. an explanation of the meaning of another's artistic or creative work; an elucidation: *an interpretation of a poem.*

3. a conception of another's behavior: *a charitable interpretation of his tactlessness.*

4. a way of interpreting.

5. the rendering of a dramatic part, music, etc., so as to bring out the meaning, or to indicate one's particular conception of it.

6. oral translation.

**rendering –**

1. prevod, preklad,

2. umelecké podanie, spodobenie, stvámenie, vyjadrenie, prevedenie, interpretácia, prednes

**elucidation** - objasnenie, osvetlenie