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## APPLICATION FOR EXOSKELETON DESIGN ELEMENTS

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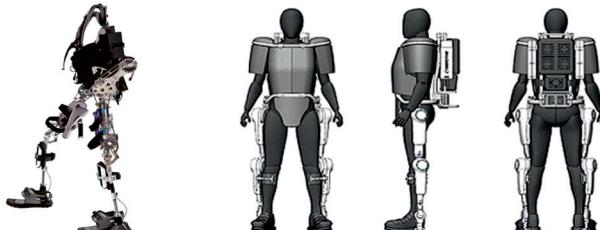
*This paper deals with the possibilities of applying the rules of design and technical elements of the complex structure such as exoskeletons. Exoskeletons are primarily designed to facilitate the movement of humans, which corresponds to the sequence of steps in the actual design. Surface styling is usually the last change before the actual production.*

**Keywords:** *exoskeleton, design, corporate identity*

**INTRODUCTION.** One of the crucial aspects when buying a certain product is the design. Currently it has already its inseparable part. The basic objective is to take eye-catching design, but also exceptional functional properties. Product design is a creative activity. Shape by the concept of functional parts to the overall design of the product. In addition to performance and price of the design is one of the key criteria when buying a wide range of consumer goods. The industrial design is quite dominant coupling efficiency and artistic qualities more impressive.

The term "exoskeleton" (Fig. 1) can be translated roughly as "exoskeleton". In reality, it is not entirely accurate, because this device is more than a single mechanical support. More accurate label would be "external prosthesis". Handicap physically handicapped person is often an insurmountable obstacle to the survival of his life at least a reasonable quality, so any compensation comes in handy.

Cyberdyne company which is located near the city of Tokyo has launched a device through which they can walk again, people who have trouble walking. The new exoskeleton was named HAL (hybrid assistive limb). This "limb" is attached to the body at the waist, calves and thighs. A robotic leg performs a movement on the basis of brain signals (Fig. 4). They depict the skin in the area of attachment. Movement is held force that lacks human feet. The resulting walking is indeed slow but smooth. Interestingly, the motors HAL - able to cues from the wearer's brain react faster than his muscles. Have already presented several prototypes of the device under the name HAL. Differed was the number to 5 " Quintet " will not, unlike its predecessors require backpack with computer and network communicator - they will be embedded in the straps and will have less weight. HAL 3 weighs 22 kg, HAL 4 is about 5 kg lighter. HAL5 is 10 kg.



*Fig. 1: Classical and HAL exoskeleton design with a backpack in which is stored a computer.*

An interesting feature of this model is that it operates on the principle of a percentage increase physical strength of the individual, therefore, the stronger you are, the greater the effect of using this model. Those who do not have a problem with walking such a device use as well. HAL legs adds strength and thus in the event that a person on foot print 114 kg, with the support can print up to 205 kg. [3]

**DESIGN AND ITS APPLICATION.** When designing design some object designer must take into account several factors. Has to select the shape and material which is suitable to function, it must take into account the cost of production, safety and durability of the product and its final appearance. The aim of industrial design is a product that is functional and stylish at the same time.

Design and thus the visual style can be divided into two basic types and design three-dimensional (3D), which divides the design environment and product design (such as the shape of the product) and design two-dimensional (2D) or graphic (final color of the product). In practice, the commonly used and their combination. [2]

**CI – CORPORATE IDENTITY.** Visual style can be described as two-dimensional and three-dimensional. As a further criterion for the allocation of visual style is kind of used. Then it can be divided into object and subjective. Object (CI) is seen either as an individual (designer) or group (corporate).

CI individual is characterized by entrusting an external designer desired task. Designer consults with the owner proposals, in which case the designer leaves freer hand. On these proposals can be observed a kind of "signature" author on his work. CI is characterized by a set number of fixed or agreed elements and principles that are used for their own products. [1]

**TYPING CI.** If the CI just one element (shape, color, material), the circuit consists of one 3 points imaginary triangle CI, Fig. 2 [1]



Fig.2 Application CI 1st order.

For unified visual style, which consists of just two elements, the position of the ratio of the total style take values between these points. This means that a change of this style will move along the line segment imaginary triangle CI. At CI 2nd order, it is appropriate to use the same parameters: material and color.

Combination of three elements in the CI offers us a wider scope. They will get the opportunity to design the product in several types and even while maintaining the overall impression of unity (Fig. 3). When plotting CI consists of three elements in the triangle area created us. Rule, the resulting value is closer to one of the vertices of the triangle, the element has a higher importance for determining the CI.



Figure 3: Illustration of CI 3rd order different exoskeleton.

**CONCLUSION.** The aim of this article was to summarize information regarding the exoskeleton and how to apply design element CI to a specific exoskeleton. Based on the structure of a single visual style to individual orders has been shown in various exoskeleton that applied design at various points sequentially.

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