

CONIC SECTIONS IN LOGO FORMING

Irina KUZNETSOVA¹, Anna BURAVSKA²

1. ABSTRACT

The research describes the most common elements of the logo, which can be obtained with conic sections in computer design. To analyse their role in shaping the logo there were selected signs in which dominant role in composition and aesthetic perception belongs to point, line, and pair of intersecting lines, ellipse, circle, parabola, and hyperbola and perspective images of circle.

KEYWORDS: Logo, Conic Sections, Plane, Aesthetic Reception

2. INTRODUCTION

Most modern logos represent a composition of different elements. Depending on the information transmitted by creating an image, the same geometrically formed element can play a major or minor formative role. Limited time to the logo review requires a special selection of compositional means of expression and the way information transfer. The aim of this study was to investigate the constituent elements of the logo formed with conic sections. The objectives of the study included: an analysis of the existing logo to identify key formative elements, comparing and finding the most effective variations for geometric construction of selected items, as well as analysis of the features of aesthetic perception, depending on the characteristics of logo forming. Logos design and perception were analysed by D. K. Verkman B. Elbryun V. O. Pobedin, N. V. Konik, V. N. Krasheninnikov, V. E. Shchailenko and M. I. Yakovlev investigated geometrical shaping of signs in graphic design.

3. BASIC INFORMATION

In the process of investigating the possibilities of computer geometric modelling logos we have analysed the formation of modern logos of companies and organizations. A statistical study of more than 1000 logos shows that the most common geometrically formed elements in them are variations of conic sections, which include points, lines, a pair of intersecting lines, ellipse, circle, parabola, hyperbola, and perspective views of the circle. In general signs containing one or more conic sections account for 75% of the total analysed logos.

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Exploring perception logos obtained on the base of conic sections, these studies can be correlated with the perception of a light ray, projected onto a plane.

Dominant for creating logos are no degenerate conic sections in which the plane of section doesn't pass through the top of the conical surface and isn't parallel to the generatrix cylindrical surface. Such sections are used in 66.8% of logos, where 11.9% of logo includes ellipse, 14% parabola, and 8.9% hyperbola. The most common among this type of conic sections in logo forming is a circle – 32%.

Conic sections, which break down or degenerate as a result of the passage cross-sectional plane through the top of the conical surface or when the section plane is parallel to the cylindrical surface, are included in 26.6% of logos. Point is the most often used (14.8%) in logos with this type of conic sections; it is followed by intersecting lines (7.4%). In logo shaping the definitions of direct and line coincide and occur in 4.4% of the examples.

Perspective images of the circle included in 6.6% logos with conic sections.

Basis or a component of the majority of logos is a circle, which can be expressed as a continuous or intermittent contour, as a spot, or it can be formed at the intersection of figures, etc. (Fig. 1). Many companies depict this easy perceptible symbol of the sun, moon, planets, and the use of which has its roots in the history of different cultures. Circle practically does not cause human negative emotions and associations.

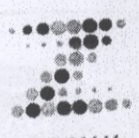




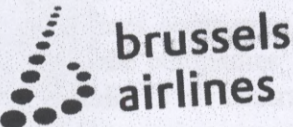


Point	Direct	Crossing lines	Ellipse
 ZONIK			
Hyperbola	Perspective views of the circle	Parabola	Circle
			

Fig. 1. Examples of logos including elements formed with conic section

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Point in the logo design serves as the basic element both for geometric and compositional constructions. Point can be a separate accent element or it can form groups, depicting the congestion, rarefaction, movement in a certain direction.

With the help of straight line certain semantic components of logo composition can be emphasized, for example – the inscription, accent element; it also creates the direction of movement, causes the effect of the dynamics. Straight lines are the basic elements of linguistic logos displayed with the alphanumeric signs. These logos have a number of advantages: they are simple to use, easy to understand, they can be used in different cases in any culture. As an independent artistic logo element straight lines can emphasize name or part of an image to form a system of symbolic indication of the direction of movement etc., can emphasize or conversely divide, create some contrast.

To create the effect of combination or goal achievement designers use the intersection lines in logo forming. This way of forming is often used to create logos of institutions and organizations which are proud of their traditions, prefer legibility, thinness and clarity. Intersection lines represent the dynamism, that's why the logo content is often expressed in their direction and thickness.

Elements formed with mathematically programmed and similar curves are often used as a basic element of the font lettering and as a modular element of the image. The most common of these curves is parabola. A branch or complete symmetrical image of parabola forms the basis of logos with heraldic symbols.

Hyperbole often acts as a repeating item, such as a part of the wing image. Parabola and hyperbola as forming elements have clearly expressed plastic attraction and generate a definite pattern in their visual perception. The human mind associates new images with already known ones that are why such logos may cause of the subconscious shapes of flora and fauna, optical patterns, etc.

Ellipse in logos depends on imaginative solutions and it can be expressed with a contour or a stain. This form is often used as additional element to other images, usually it is used as an independent decorative element in conjunction with the company name. Imaginative filling of this shape causes consumer associations with movement in a circle or an orbit – world tours, which are used in the logos of travel and airlines companies, as well as the illusion of infinity, which is often used in automobile companies' logos. The shape of ellipse is closed and has the ability to organically fit the contrasting imagery and style characteristics of substantive form.

Perspective images of the circle create the illusion of dynamics in static images; using several of these elements designers can transfer the direction of movement.

In most cases, each of the aforesaid elements forming logos is used in conjunction with other forms and font lettering. The combination of elements in the different order with the change in their number, position, size, distance, and other characteristics forms a wide range of possibilities of logo forming with geometric

Taking into account the fact that in most cases logo is a combination of many elements formed and integrated into a coherent whole with different geometric ways, the question is in determining the extent and characteristics of aesthetic perception of logo depending on its degree of difficulty.

The perception of logo on the scheme matches the direct, consisting of links – stages, the first of which is concept and strategy of identity for company, product or service; the second – the logo; the third – the recipient or the consumer, the fourth – the crowning stage – concrete action.

Geometric arranging of logo's elements acts as its aesthetic characteristic and can be calculated by the relevant formulas.

Depending on the perception audience basic aesthetic indicators set out in the text begin to differ. Conditionally there can be distinguished two main aesthetic directions of forming logo concept:

1. Elitist. Logos, formed on the basis of such direction include the desire to deliver maximum enjoyment to minimum sophisticated consumers by difficult to recognize real in the illustrated. In this case, the logo may take the form of riddle, or completely lose relations with the real object. The main tool is the complexity of the content and the transmission method, which increases the complication of aesthetic perception, reduces the availability of the logo, but substantial reception efforts cause the growth of aesthetic pleasure. Aesthetic pleasure from such logo can be calculated with formula created by Eysenck [3]:

$$M = O \times C \quad (1)$$

in which the aesthetic measure M is product of order O and complexity C . Thus, the intensity of aesthetic perception and enjoyment is directly proportional to order and complexity of the logo. Most often in logos of this direction are used such elements as an ellipse, parabola, hyperbola.

2. Mass. In this direction, the degree of conditionality is insignificant. Such logo does not require intellectual effort for their understanding because of the ease of recognition, matching the real object. These logos are commonly understood, but aesthetically ineffective: they bring minimum pleasure to the maximum number of cultural untrained consumers. The main tool is simplifying the content and the method of transmission, what leads to the relief of its reception, which in its turn leads to a reduction of aesthetic pleasure. Aesthetic pleasure for logos created in this direction can be calculated with formula created by Birkhoff [1]

$$M = O : C \quad (2)$$

in which the aesthetic measure M is directly proportional to order O , and inversely proportional to the complexity C . Efforts to focus attention on the contours of the object increase in proportion to the complexity of the parts. In the logos of mass direction prevails straight lines, dots, and circles.

These studies have similar results to the hypothesis N. Yakovlev of the priority perception images on the picture plane through the ellipse. Yakovlev carried out his research on the base of the theory of irradiation contained by G. Ruuber. Further

studies of the perception of of their work.

4. CONCLUSIONS

Forming, as one of classification of logos, when

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There was determining methods of forming the el major directions of aesthe ellipse, parabola and hyper dots and circles.

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a combination of many different geometric ways of aesthetic perception of their work.

CONCLUSIONS

Forming, as one of the main categories of design theory, is a basis for classification of logos, where the geometry of formation acts as classifier.

In the process of research we developed the classification of forming basic compositional elements of logos with conic sections, which include points, lines, a pair of intersecting lines, ellipse, circle, parabola, hyperbola and a perspective view of a circle.

There was determined the connection of aesthetic perception and geometric methods of forming the elements of logos, on which base there were identified two major directions of aesthetic perception of logos: elitist, where prevails usage of ellipse, parabola and hyperbola, and mass, which is characterized by the use of lines, parabolas and circles.

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