Journal of Arts & Humanities

Creating a Triple-System Grid as an Approach to Sign Design for Visual Communication and Advertising

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ABSTRACT

Throughout history, the Grid System has played a significant role in visual communication and design, for it has always provided the designers with a reliable system to follow during the design process and helped them reaching satisfying design outcomes. From here comes the topic of this research which is concerned with creating a pre-set grid system based on a simple geometrical layout using the three primary geometrical shapes; the square, the circle and the triangle for the purpose of generating sign designs & logotypes for visual communication purposes. Through an experimental study the research seeks to acquire a constant grid system for designing signs that with its basic geometrical layout & symbolic function forms a reliable system which can be followed to get variable, simple & concrete sign designs for different visual communication media. The research follows experimental research procedures following significant design process with its steps, presenting design layout & samples through practical work based on theoretical background, till reaching the final design output stating the results & discussion.

1.0   Introduction

Since the beginning & the emergence of graphic design, designers have been trying to find and create systems that would assist them through their work to get satisfying & accurate results for their designs. The grid as a system has always been a reliable system to use & follow however, even if graphic designers sometimes decide to break up these rules. The importance of the grid system lies mainly in offering the designer a reliable & a well-organized layout that gives him what he needs & would go with whatever design he attempts to realize.

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And throughout history, the grid has played an important role in influencing visual artists & graphic designers to obtain systematic designs that are set to function. A well-recognized example of this was presented by the Islamic culture where Islamic craftsmen and artists – who were prohibited from making representations of people in holy sites – developed an instantly recognizable aesthetic rule based on repeated geometrical shapes. The mathematical elegance of these designs is that no matter how elaborate they are, they are always based on grids constructed using only a ruler and a pair of compass. These Islamic designs are based on Greek geometry, which teaches us that starting with very basic assumptions we can build up a remarkable number of proofs about shapes. Islamic patterns provide a visual confirmation of the complexity that can be achieved with such simple tools. (Bellos, 2016).

Consisting of, or generated from, such simple shapes as the circle and the square, geometric patterns were combined, duplicated, interlaced, and arranged in intricate combinations, thus becoming one of the most distinguishing features of Islamic art. The four basic shapes, or "repeat units," from which the more complicated patterns are constructed are: circles and interlaced circles; squares or four-sided polygons; the ubiquitous star pattern ultimately derived from squares and triangles inscribed in a circle; and multisided polygons. (Department of Islamic Art, 2000)

Later on and after World War II, a number of graphic designers, including Max Bill, Emil Ruder, and Josef Müller-Brockmann, influenced by the modernist ideas of Jan Tschichold's *Die neue Typographie* (The New Typography), began to question the relevance of the conventional page layout of the time. They began to devise a flexible system able to help designers achieve coherency in organizing the page. The result was the modern typographic grid that became associated with the International Typographic Style. The seminal work on the subject, *Grid systems in graphic design* by Müller-Brockmann, helped propagate the use of the grid, first in Europe, and later in North America. (Schneider, 2011)

The Grid has played a central role in the development and consolidation of modern movement in twentieth-century graphic design. Due to its ostensible use during this period as a compositional design matrix for controlling the placement of typography and imagery, the modernist grid was present in the finished design. Consequently, its symbolic aspect is not generally recognized or even suspected. Though equally obscure in significance, the contrasting decorative role of the grid as a prominent piece of visual iconography in postmodernist graphic design more readily admits a possible symbolic function. (Williamson,1986).

And due to this significance was the topic of this paper where the author attempts to create a triple-system grid that by applying it the graphic designer can acquire significant, pre-set geometrical sign designs & logotypes for different visual communication & advertising purposes.

1.01   Research hypothesis

Throughout this paper the author seeks to present a pre-set grid system in an experimental study based on the use of the three basic geometrical shapes; the square, the circle & the triangle forming a triple-system grid for designing signs & logotypes, that with its basic geometrical layout & symbolic function forms a reliable system that can be followed to get variant, simple & concrete sign designs for different visual communication media & advertising purposes.

1.02   Objectives of the research

The objectives of the research can be summed up as follows:
- Creating a multipurpose, grid-based system that helps graphic designers get simple & precise sign designs.
- Obtaining different designs emerging from this system for logotypes applying meaningful patterns and/or letter-forms to be applied in both printed & multimedia communication facilities.
- Focusing on the design processes and procedures to get creative and applicable sign design results that could serve as a unique visual alphabet for communication systems.

2.0   Theoretical background

Shape is considered one of the basic elements of design. Alone or in combination with other shapes or lines they can convey universal meanings as well as guide the eye or organize information. The three basic types of shapes are geometric, natural, and abstract shapes. Geometric shapes are structured & often symmetrical; these include squares, circles, and triangles but also octagons, hexagons, and cones. (Howard, 2012)

Nature has covered the earth with an endless variety of shapes & the most powerful of which have always been the most basic and most fundamental: the square, the circle & the triangle. For centuries, scientists and mathematicians have exerted a lot of effort investigating these shapes trying to find out their structure & benefiting from their mathematical relationships regarding each other.

The shape of an object we see does not, however, depend only on its retinal projection at a given moment. Strictly speaking, the image is determined by the totality of visual experiences. (Arnheim, 1997)

Everything has a shape but the basic shapes of squares, circles and triangles can be very effective in design especially sign design, in part because of their simplicity which goes straight-forward with the logo design main fundamentals. These shapes have certain sub-conscious meanings as well.
- **The square** denotes stability, equality, and honesty.
- **The circle** is protective & infinite.
- **The triangle** suggests tension or conflict or action.

There are so many things a designer can "design" using only squares, circles or triangles. Alternating direction or color, disrupting a pattern with another shape or a shape out of alignment can add interest & suggest abstract ideas. A triangle alone or a series of overlapping ones can "point" in one or more directions. Replace letters in a word or name with shapes that suggest those letters. A triangle for A or V is obvious. A circle for an O or perhaps two stacked circles for an S can efficiently form an appropriate visual representation. (Howard, 2011)

2.01   What is a sign?

In semiotics, a **sign** is "something that stands for something, to someone in some capacity" It may be understood as a discrete unit of meaning, and includes words, images, gestures, scents, tastes, textures, sounds – essentially all of the ways in which information can be communicated as a message by any sentient, reasoning mind to another. (Danesi & Perron, 2012)

And throughout the development of communication systems the sign or the signage became a term that describes any kind of visual graphics created to display information to a particular audience. This is typically manifested in the form of way finding information in places such as streets or inside/outside of buildings. (Project Gutenberg, 2015)

Out from the sign as a general term several graphic terms emerged describing the use of a significant sign in a specific field or purpose. Some of which are logos, marks, pictograms and other forms of signs that serve as visual communication tools.

2.02   The logo

From the Greek λογότυπος = logotipos, is a graphical element, symbol, or icon that, together with its **logotype** (which is set in a unique typeface or arranged in a particular way), form a trademark or brand. A typical logo is designed to cause immediate recognition by the viewer. The logo is one aspect of the brand of a company or economic entity, and the shapes, colors, fonts and images are usually different from others in a similar market. Logos may also be used to identify organizations, activities, persona or other entities in non-economic contexts.

Logo designs don't need to be elaborate, and usually work best when they are kept simple. This can be observed when designing symbols, pictograms & street signs. Thus simple shapes can work efficiently & creatively as well. (Howard, 2011)

2.03   The grid system

A grid can be generally defined as "a structure used to guide the placement of elements on a page". A grid divides up the available area into a number of subdivisions (units) providing a visual structure on which the design can be based. (Dabner, 2004)

There is really no limit to the grid layouts that can be created. Common types of grids form a series of guidelines that determine the margins of the design piece, space between page elements (headlines, body text, photographs, etc.), and let you know where to put things on the blank page. They often include equally sized two, three and four-column grids with a header across the top, as well as a full-page grid of squares. From these building blocks, the variation of column widths, borders, page size and other features of the grid will lead to unique page design. One grid, or a collection of grids, may be used across an entire project to achieve a consistent look and feel. In a finished product, the grid is invisible, but following it helps in creating successful print and media layouts.

3.0   The triple-system grid structure

The triple-system grid is simply based on the combination of the three basic simple geometrical shapes; the square, the circle & the triangle to form its final visual state (Figure 1). These simple shapes organize a wealth of meaning, and form an overall structure that clearly defines the place and function of every detail in the whole. Through this way of organizing a structure in the simplest possible way, we can form a system that creates orderliness in which variant & well organized sign designs can be executed. (Figure 2)

Figure 1	Figure 2
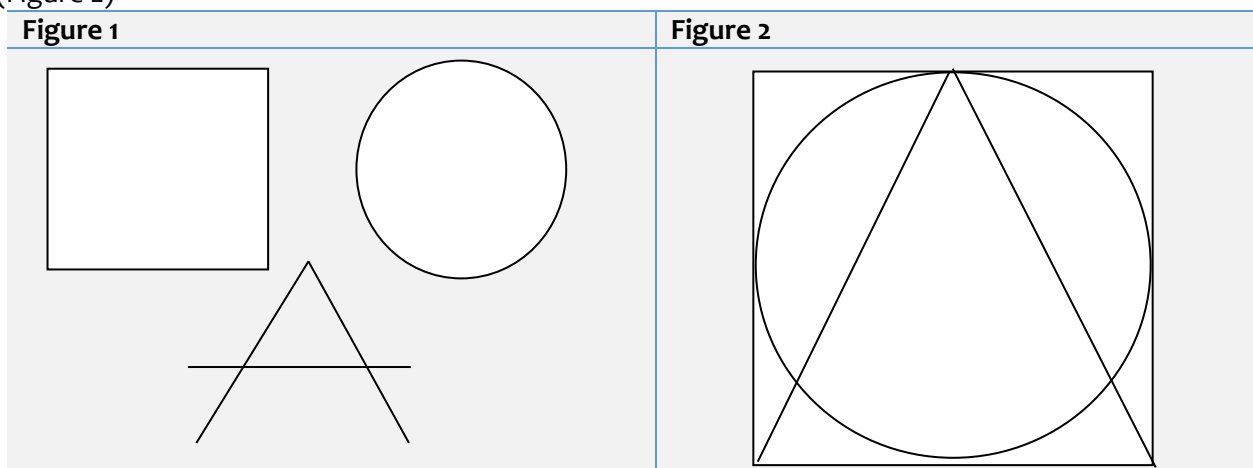
Complexity can be obtained by combining geometrically these three simple shapes and their subdivisions through three phases and the combinations in turn hold together a system that can form simple but rich orderliness.

3.01   Designing the triple-system grid

The triple-system grid presents a basic geometrical system that is mainly based on a non-measurable dividing formula which assists in making several divisions & subdivisions to get varieties of patterns, letterforms & figures that help producing a logotype design, a pictogram, a simple sign, or an alphabetical letter to use for different communication systems. This system starts with the square as a launching layout which evolves continuously to form the complex final state of the grid. Through this structure the triple-system grid forms a flexible and a variable layout as it can be used for application generating logotype designs in each & every step of its formation & in each of its layouts throughout the three phases of construction.

3.02   The "Square" as a starting point

The choice of the square as a starting point comes from the structural nature of this shape as a four intersecting straight equal lines with four right angles that forms the suitable layout and triggers the geometrical division for the grid.

Figure 3
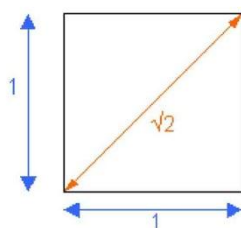
The Square symbolizes the imposition of structure upon the earth. Instead of the limitless circle, we now have the orientation and implied directions of the Four. Four quarters, four directions, four elements… and so on. We are perhaps more familiar with this shape than any other, since it permeates our lives in practically everything we build or make. The important bit of the square is the diagonal. If the square has sides of 1 unit in length, then the length of the diagonal is the square root of 2 ($\sqrt{2}$ =1.41421…). (Gardner G., 2003) (Figure 3)

Starting with the square, the main task is to generate a grid as a general code that can be used to acquire a certain language of patterns and figures entirely harmonic and symmetrical. The basic square dimensions are decided according to the design purpose and are identified only in the first step that is the original layout of the square. (Figure 4)

Figure 4
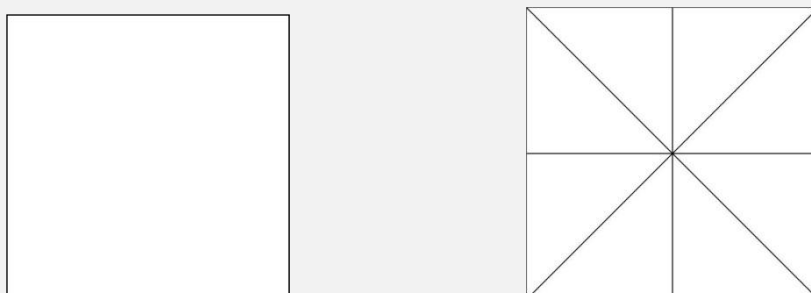
The basic square has to be divided by single steps one after another starting with connecting the diagonals. By this we don't have to measure or do further calculations, we just connect originated points in parallel & intersection to create another anchor. Each dividing step has to be done symmetrically & has to be repeated in the following step, where the next division takes place. Each step has to originate from the previous step and each new line or a circle has to be caused by an existing center, as there is no arrangement done haphazardly or by chance. This set of rules guarantees that any line is related to the whole and conserves the original system.

3.03   The First phase of the triple-system grid

The square grid:

The square grid forms the first phase of the final triple-system grid. This square grid is based on a simple geometrical formula out of only the square that repeats itself according to a stable system of division to finally get the grid design (figures 5, 6, 7 & 8). It is basically equal & symmetrical system of division generating different patterns and intersections.

Figure 5	Figure 6

Figure 7	Figure 8
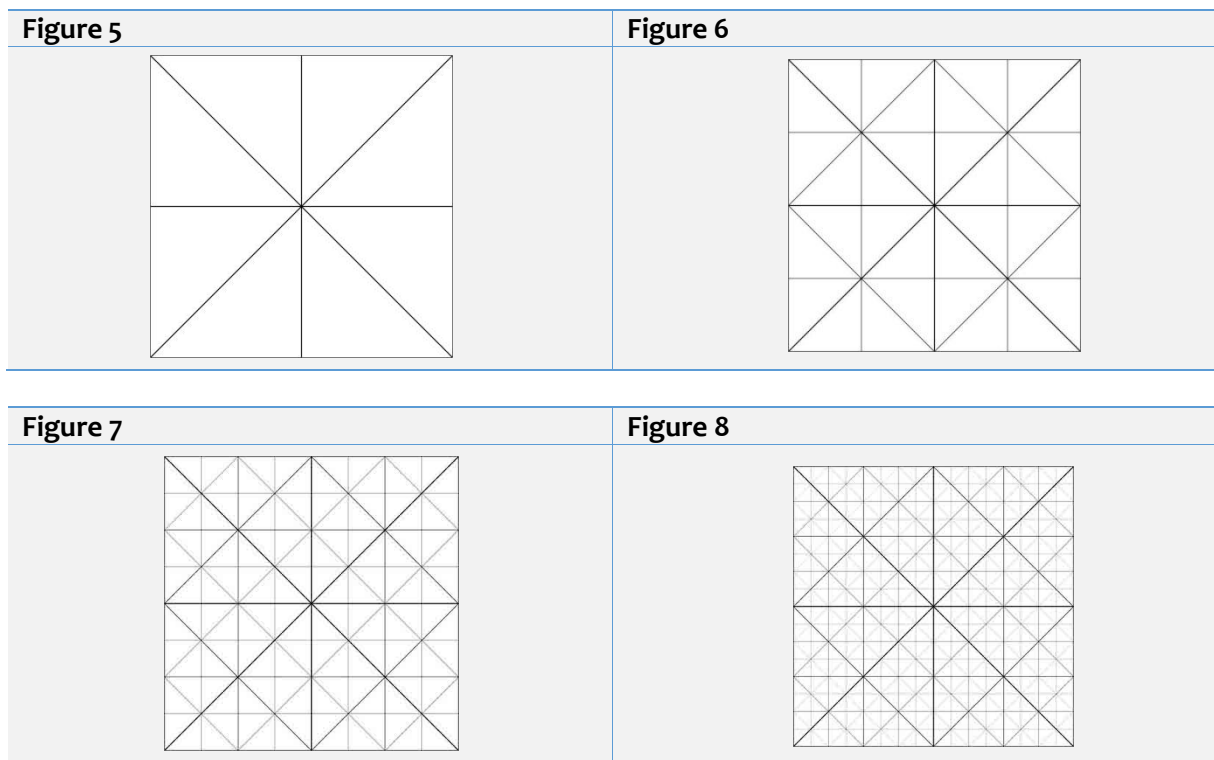
Through this simple structure based on symmetry and logic allocation a "matrix" or a "code" can be created for different designs with unlimited varieties, generating a simple visual language that can be identified easily & that can help generating simple & consistent logotype designs.

3.04   The second phase of the triple-system grid

The combination of both the square & the circle:

This phase is generated through adding the circle to the square. The circle's diameter equals the side length of the square, & the circumference of the circle equals the perimeter of the square so that when it is fitted inside the square it intersects with the square in four points that jill form the new origins of the second phase grid (Figure 9). By connecting these points we get four new inner squares where four new circles will be embedded (Figure 10), where their centers will be the result of connecting each of

the new squares' diagonals, and by following this geometrical sequence we will get the second phase of the triple-system grid.

| Figure 9	Figure 10
Figure 11	**Figure 12**
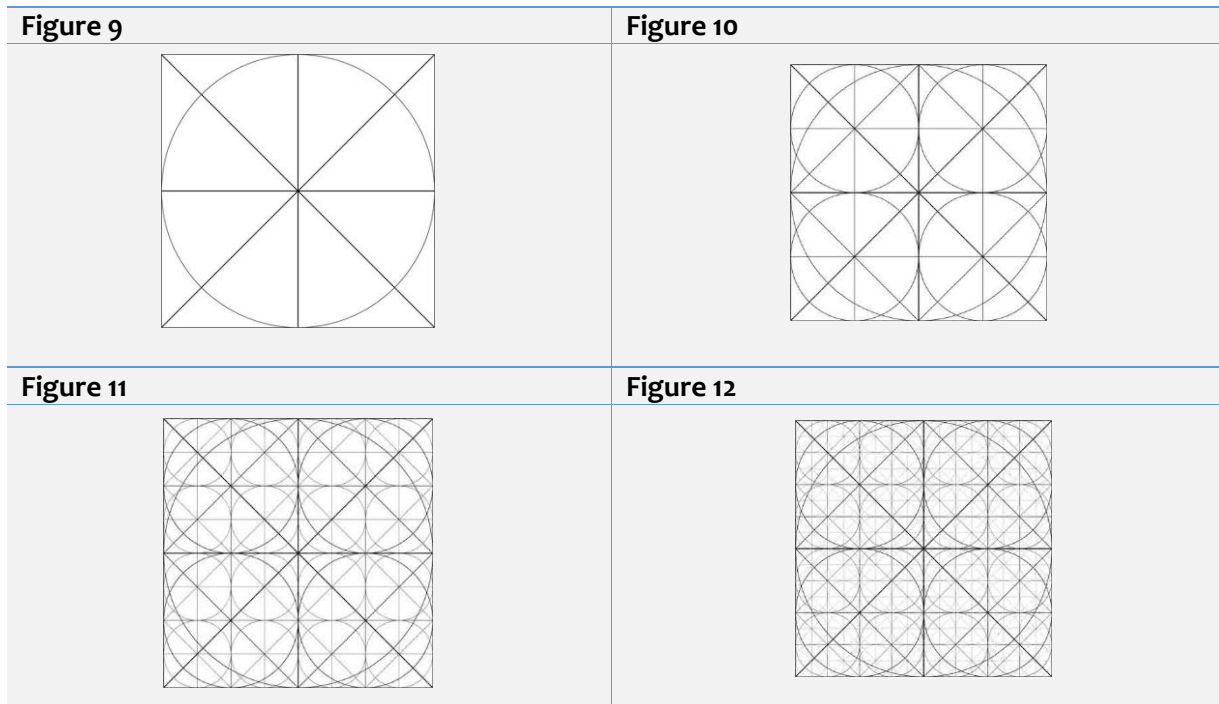
We must note that the degree of complication of the grid will depend on the number of divisions and subdivisions of the basic shapes. So if we want the grid to be more simple and less complex we don't divide the original grid more than three times.

3.05   The third phase of the triple-system grid

The final combination of the square, the circle & the triangle

Through this phase the double-system of surfaces is changed & a new degree of complexity is achieved. In this phase an equilateral triangle is superimposed on the previous double-system structure creating a new division & generating new subdivisions with different angles & orientations. The triangle is laid in such a way that one of its three angles intersects with the originated point generated from the intersection of the main circle circumference with the square while the other two angles of the triangle intersects with the opposite square angles. (Figure 13)

Figure 13	Figure 14
Figure 15	**Figure 16**
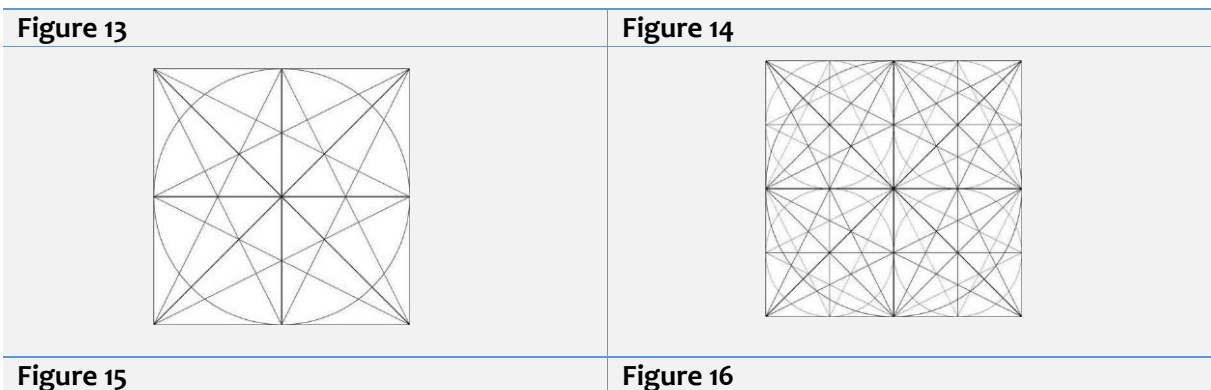
By following this code and repeating it in all directions a new layout is formed that is more varied & more detailed, which will assist in achieving a new generation of logotypes with different structures. (Figure 16)

4.0   Generating the sign designs

4.01   The design process

According to the basic law of visual perception, any stimulus pattern tends to be seen in such a way that the resulting structure is as simple as the given conditions permit. This tendency decreases when the stimulus is so strong that it exerts a compelling control. Under such conditions the receptor mechanism is free only to arrange the given elements in the simplest possible way, as when the stimulus is less complicated, the organizing power of perception can assert itself more fully. (Arnheim, 1997)

By applying this basic law every division in the triple-system grid will be perceived as a separate but yet a part of the whole structure, but this will be only strong when less complexity is achieved. Accordingly in order to figure out the appropriate structure of the desired sign design one should not exaggerate in dividing the given space of the grid in order to maintain a simple & a strong design besides helping our vision in spotting the areas & divisions to use in order to build up the sign. However, this system allows the opportunity to get the most complicated structures if desired.

4.02   The process consists of two variables

1) The grid layout which is formed by the accumulation of the three main geometrical shapes; the square, the circle and the triangle through three main phases; square grid based design , square-circle grid based design , triple system grid based design .
2) The sign design which is formed through implementation to the grid layout and can be categorized into three main forms; the letter based design, the figure based design and the letter – figure based design.

4.03   Steps & procedures of designing the sign

As we begin to generate the logotype of the triple-system grid we need to give ourselves the opportunity to experiment the layout with an in-depth eye & imaginative vision. This layout can be rich & creative approach that provides a lot of chances and probabilities of design, that if the designer explores it thoroughly he can get quick, unique & interesting results. This can be achieved through a series of consecutive steps that will lead to the final sign design as follows:

Step1: This starts by identifying the preliminary dimensions of the grid starting with the square layout.
Step2: The area is then divided following the non-measurable rule of division starting with connecting the diagonals of the square as a launching point.

Step3: After this stage the designer has the choice of applying one of the three phases of the triple-system grid, two of the phases combined together, or the complete final layout that combines the first, the second & the third phases altogether.

Step4: Here we reach the stage of extracting & generating the logotype design out of this system.

Step5: This is done by filling in the generated divisions & subdivisions that the designer points out to form his final logo design. This can be done drafty using crosshatching or pencil filling in case of doing this using manual processes. And in case of computerized layouts this can be easily done using one of the graphic design soft wares (i.e. Adobe illustrator or freehand… etc.)

Step6: The output will represent the final logotype design that can be then enhanced & reproduced to be applied for different visual communication purposes.

5.0   The practical applications

This section represents sign design samples generated using the triple-system grid that lie into three main categories:

- Category no.1: Letter based sign design
- Category no.2: Figure based sign design
- Category no.3: Letter - Figure based sign design

5.01   Category no. 1: Letter based sign design

In the first category, the design process is mainly focusing on getting logotype designs formed only out of letters & characters of the alphabet. The researcher shows some practical samples presenting Latin letterforms that through this design system can form an identified logotype design which can be applied for various textual & typographical communication purposes.

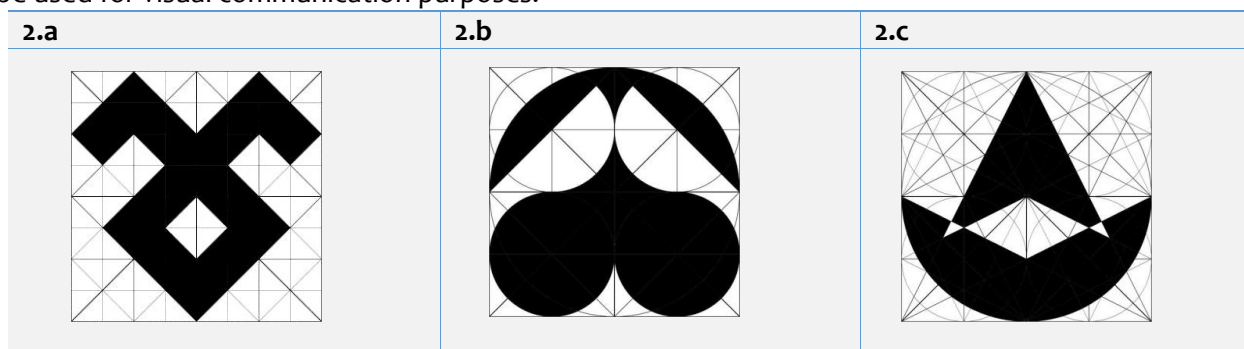| 1.a	1.b	1.c
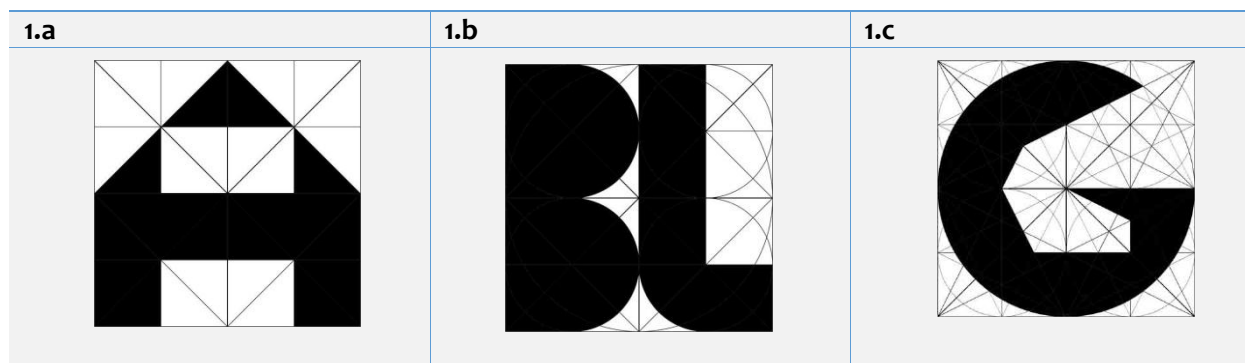
Experiment 1.a. square grid based design – phase1
Experiment 1.b. square-circle grid based design- phase2
Experiment 1.c. triple- system grid based design- phase3

5.02   Category no. 2: Figure based sign design

In the second category, the main focus is to get a sign design based on representing a pattern that can be either abstract or figurative, which displays a simplified image of an object or an ornament that can be used for visual communication purposes.
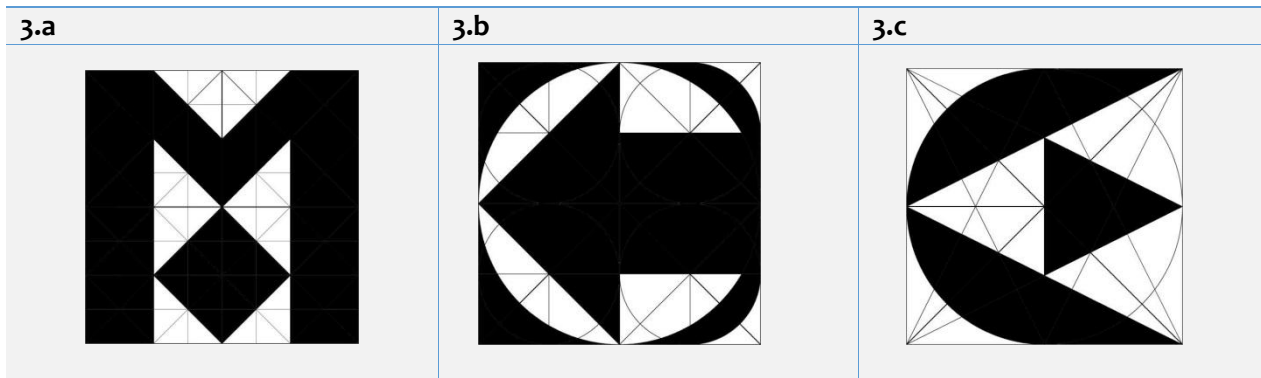
2.a	2.b	2.c

Experiment 2.a. square grid based design - phase1
Experiment 2.b. square-circle grid based design- phase2
Experiment 2.c. triple- system grid based design- phase3

5.03   Category no.3: Letter – Figure based sign design

In this third category, the design process focuses on getting a logo design that links between both a letterform & an abstract figure to form the final logo. This is considered as an intermediate category that benefits from both letter and pattern approaches.

3.a	3.b	3.c

Experiment 3.a. square grid based design - phase1
Experiment 3.b. square-circle grid base design – phase2
Experiment 3.c. triple- system grid base design – phase3

5.04   Practical Observations & Discussion:

1. Through practical implementation done by the researcher, the first category of the design process; letter-based sign design appears to be easier in application throughout the three phases of the layout, facing less effort while conformation, where compartments are easier to perceive and control regarding the significant characteristics of the letterforms.
2. The second phase of the grid; square-circle grid base design, acts on a moderate level of complexity as the combination of the square and the circle offers a smooth and rich system to follow without facing much difficulty in recognizing the different compartments and divisions of the grid layout.
3. The third phase of the grid; the triple – grid layout becomes more complicated with the division process, as with more subdivisions generated, a more complex system is produced where the grid compartments are harder to perceive and more difficult to identify, thus hindering the ability to apply more sign designs to the grid in an easy manner. Although having the ability to get more sophisticated and more detailed sign designs, this requires more effort to use as a base for sign design applications which will need more concentration and focus to get the desired results.
4. Applying letters was easier than figures as the letter characters are stable and known, which makes it easy to fit into the triple grid system with minimum effort and imagination, while the figures needed more time to conform and much experiment to reach the desirable construction. This needs more sketching regarding forming a figure-based sign design where the grid layout gives a stable layout for the final design.

6.0   Results & Conclusion

Through the theoretical content and the practical experiments presented in this study, the researcher could deduct a group of results that would meet the original hypothesis of the research & present a practical approach to sign design as a tool for visual communication & advertising purposes.

These results can be stated as follows:

1. The triple-system grid offers a wide range of experimentation that helps get significant logo design results based on a pre-set simple geometrical system that the grid adopts. This helps facilitate the design process and provides a visual communication language that can serve effectively in the field of sign design. This design process could be achieved only by maintaining the overall layout and following the recurring design steps that fit with the grid layout. (See Appendix1 for more design experiments)

2. 2- The triple-system grid conception brings two great enrichments;
First: it offers extension in space through layers and therefore varieties of size and shape; round and angular and most irregular ones can be emerged.
Second: it adds to space the differences in direction and orientation, as the generated shapes can be distinguished according to the many possible directions they point to and thus their placement in relation to one another can be endlessly varied.

3. This system urges the eye to explore it, pointing out the appropriate compartments and subdivisions that can build up the structure of the desired sign design, which can help activate the creative process producing expressive combinations that could produce coherent sign designs.

4. The triple-system grid provides different stages of complexity throughout its phases, where each of the three phases can be used as an individual system by itself. This helps getting sign design results with different levels of complexity, offering more visual design solutions.

5. As we follow the design steps through the triple-system grid we could acquire a simple and a consistent design system to follow, nevertheless in order to get hundreds of probabilities and possibilities of sign design results through experimentation, we need to follow a strict system which does not offer much alterations in the given area, but still offers section varieties within the system itself.

It is an absolute rule to follow the guidelines of this system understanding the meaning and the philosophy of this significant structure and the several design possibilities it could provide.

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Appendix

- Trial samples of logotypes & signs created by the Triple Grid System.