Development of a Novel Grid Model by Instilling Tree as a Natural Element*

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Abstract -
Purpose-The purpose of this paper is to provide a grid method to design poster and magazine in easiest way through structural grid. It is also a solution to derive grid model for designers in expressive and more organized way.

Design/ Methodology/Approach: The process followed in this study, brings a structured method by using a tree structure an element from nature in a specific order to avoid anarchy and arbitrariness.

Findings- The system generates the original grid itself and completely determines the mapping of objects to position within the grid which gives a guided style sheet specified for the layout.

Research implications/ limitations- The present study examined the process with amateur designers to design poster as defined in paper. As per feedback received, more complex grid could be designed to formulate layout for magazine design.

Practical implications- As per the method defined in this paper, to achieve good visual layout, more experimentation is advised to present ordered message together to get uniformity by gathering content, image, graphics and photographs for strong communication.

Originality/ Value- The paper provides simple method to provide a design solution for amateur/ non designers.

Key words- Flexible grid, graphical layout, posters, magazine, publication grid.

INTRODUCTION

From pre historic period all our ancestors were worshipping nature and they realized that nature is the ultimate supreme power in true sense. Nature itself is so perfect that the entire functioning of each thing is systemized in proper space, time, place and quantity.

To bring the systemization, grid is one of the major tools to put things in organized manner. The expanding field of design, and its various applications in different fields of communication design, layout and design tasks are crucial points to bring good synergy and relativity. Therefore effective way of communication and to sustain user's attention in a meaningful manner grid matters. One essential drawback of current visual communication situation is the lack of providing adequate easy process of grid and its application in concern of layout design for young designers.

This also leads for maintaining graphical style, legibility adaptive; consistency and dynamism are majorly in to considerations.

The history of grid development is elaborate and complex. Today in modern era of graphic design, as we know it is a dynamic and to some extent glamorous. But incidences of grid use predate the Romans and the Greeks. The grid that is used in Western graphic design, evolved during the industrial revolution. Gathered here is a rather simplified overview of a complicated process. Grid is used very often as a tool in graphic design. In visual arts we can quote many examples who have taken advantages of using grid in various areas in design. It also helped to enlarge their drawings in proportion. Huge murals such as those done by Michelangelo on the ceiling of Sistine Chapel is a miracle which was possible through using grid.[7]

Grid use began to dominate European and American design during and after the 1960s. It was an especially effective way to a systemized communication program for large organizations. The idea of a totality in design, based on a grid, also found expression in the work. By the late 1970s, formatting corporate communications in a grid was expected approach for achieving visual continuity. The international style had come to be an excepted part of what graphic design was about. Designers also began to use the grid as an end in itself, and they exploited the visual potential of the form for its own utility. The grid has come to be seen as one of the many tools that designers can use for effective communication.

As we move to twenty-first century, the use of grids that developed in Europe over the last 150 years has continued to play a major role in graphic design.[18] Grid being as a major base is being widely used not only in just publication design, poster or limited to printed media, but also for websites design and largely in new media. Therefore grid concept drives to motivate towards a real and specific problem area in its own as a solution to present design in simpler way.[4]

Methodology
Design involves problem solving on visual and aesthetic level. Pictures and symbols, fields of text, headlines, tabular data, all the elements must come together to communicate. A grid is simply one approach to bring them together. Graphical representation and analysis of information begins with the grid. The grid is a metric by which we establish

distance and direction of any position relative to a reference point, line, or plane. In other words it is latitude and longitude.[3] Grids can be loose and organic, or they can be rigorous and mechanical. The benefits of working with a grid are simple- giving clarity, efficiency, economy, and continuity. A grid introduces systematic order to a layout, distinguishing types of information and easing a user's navigation through a systematic approach. It allows many individuals to collaborate on the same project or series of related projects without compromising established visual qualities. Placing a line on white blank page instantly creates a movement or a division. It's a simple line but with a direction, movement. Thus it activates the space. It's no longer simply a line but a shape. These divisions created through lines help to establish the eye movement through the material. Alignments between masses and voids visually connect or separate them. By breaking space within the compositional field, the designer stimulates and involves the viewer. As a larger interval between the lines the designer creates emphasis successfully. The mind perceives that emphasis of some kind of importance is established. A designer has unlimited options for making changes in type, size, weight, placement and interval to effect hierarchy. In short, grid organizes the relationship of alignment and hierarchies in to an intelligible order that is repeatable and understood by others.

A grid consists of a distinct set of alignment-based relationship that acts as guides for distributing elements across a format. Every grid contains some basic parts, no matter how complex the grid becomes. Each part fulfills a specific function. The parts could be combined or omitted from the overall structure, depending upon how they interpret the informational requirements of the material.

Every design problem is different and requires a systematic process that addresses its particular elements. A grid is truly successful only if, all the literal problems have been solved. Further to this it helps to sustain interest on visual part for strong communication.[18]

Grid based layout

At the core of the graphics layout problem that we are investigating is the task of determining the positions and sizes of a set of graphical images & content. In the work described here, we use information about the abstract/realistic image, graphic/photograph to be composed along with content. The challenge is to develop a set of constraints and evaluation criteria that will result in effective layouts. There are proven approaches to display layout in which arbitrary sizing and placement of objects are expressly prohibited. Grid-based layout has provided a particularly influential and effective framework for graphic design community.

In this process, the designer divides the given space with a vertical and horizontal lines called as *design grid,* whose lines are positioned in proportions based on the size of the space. The material being lay out, and the purpose for which the layout is designed is expected to take advantage of the lines created. When layout is performed using the grid, objects are typically sized and positioned so that they are aligned with the grid lines and occupy an integral number of grid fields both horizontally and vertically. This is usual practice that designers follow to set the things in right place.[11]

Design grids often consist of a set of regularly spaced vertical and horizontal lines that describe a set of equal-sized rectangular grid *fields.* The fields are separated vertically and horizontally by equal-sized spaces and the entire array of fields is surrounded on the display by top, bottom, and side margins. In general, fields need not be of equal size, but there are many designers who follow these restrictions. In some cases further constraining the fields in wearied sizes and shapes they try to bring flexibility but it depends on the network of lines created. Therefore the grid which can give dynamism and which can address unusual subjects for design, like posters, publication design, brochures, hoardings etc. the current grid model could be applicable. However the application and its apt use will matter to bring intended outcome in most effective manner with a flexible method.

In recognition of these problems, a number of researchers have investigated automated generation of both the form and content of graphical presentations. There is a host of difficult problems associated with tasks such as determining what information is to be presented, when it is to be presented, what format it will be presented in, and what kind of user input will be accepted. In contrast, the system described here concentrates only on creating an easy layout process of separately generated information and images in a structured grid.[11]

About layout material

Our implementation requires that objects to be laid out are non-overlapping upright rectangles. Even with these restrictions a layout problem may be quite costly to solve. Although the layout resulting from a space minimization strategy alone may be quite space-efficient, it may also be difficult to use and understand. The challenge is to develop a set of constraints and evaluation system that will result in generating effective layouts. While simultaneously restricting the possibilities within the grid that must be considered is a challenge.

The actual objects that will be encountered in a particular display may be thought of as instances of these general classes of objects whose properties and relationships are as inputs during the grid design phase. The system currently supports pictures, headings/titles/text blocks, which the user must further, specialize by designating limits, on their expected size and contents. As a visual representation text and graphics needs to go hand in hand to bring out the meaning in the easiest manner.[13] By generating a grid first and using it to produce multiple layouts, we gain one of the important advantages of grid-based design is to derive some system of its own, consistency and visual hierarchy. Each layout of a set is not optimized as an individual design problem, but bears a visual relationship to the others. Not only do we gain efficiency in not having to redesign each display a fresh, but the use of a common layout format

visually enforces the relationship between the displays. Furthermore, the regular spacing of the grid, and hence the regular sizes and positions of the objects embedded in it, also helps achieve a coherent, consistent look for an individual display.

Creating the grid

Here the attempt is to construct a grid, for the purpose to design a poster. Any vertical structure of a fully grown tree which has clear branches and divisions can serve the purpose. It will be more appropriate to observe a tree on eye level while selecting a tree. It is essential that entire structure of the tree is easily visible. This leads to derive a flexible grid division as per structure i.e. from main branches from top to bottom. However, structure of tree and its parts will give clarity to define grid in mind after looking to tree as a form which is 3 dimensional. The shape and overall inner and outer structure of tree creates blocks or divisions in our mind in the form of vertical and horizontal lines. As per gestalt, law of connectivity, the solid chunk of various sections appearing as division of branches and solid masses helps to create divisions, this leads to further sections and lines. The process of seeing these lines brings clarity to structure a linear grid wireframe in our mind. After analyzing the vis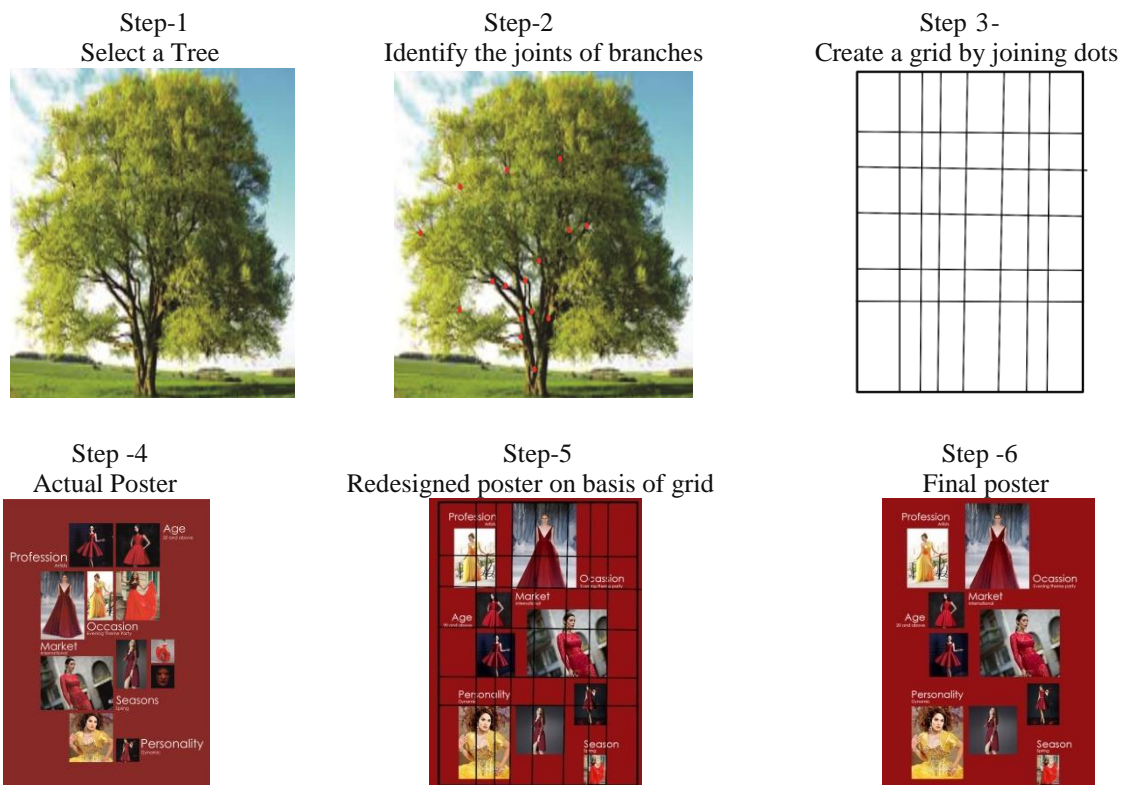ible divisions, further it has to be documented in the form of photograph and create grid lines as per the sections/divisions available. This itself could be called as structure grid as per divisions seen visually deriving from the selected tree.

Process of actual display

Selected tree could be captured in photo to derive lines as per sections availability. After completing this stage, next step is to draw lines as per division and sections visible as per structure of tree selected for designing a poster. Understanding content, image and overall matter for poster design, decision could be taken to increase or decrease lines so the content, image could be placed and could be moved in a flexible manner considering division of lines derived. This is how grid template could be made ready to design a poster with the available designing material.

Since in poster the elements used for designing is the, punch line, body copy, graphic/illustration or an image, contact details and a text message in general. Text and graphics also influence each other. The display size is derived as part of the input to the system. The sizes of the margins are set according to a standard ratio. Since proportionally-spaced fonts are used and the exact text and image can be placed on the grid lines as requirement.

Following steps demonstrates the process to derive grid and implement in designing a poster.

Step-1
Select a Tree

Step-2
Identify the joints of branches

Step 3-
Create a grid by joining dots

Step -4
Actual Poster

Step-5
Redesigned poster on basis of grid

Step -6
Final poster

Above system presented generates the original grid itself and it builds connectivity of objects to positions in the grid. First a grid is created, based on information about the material to be laid out, the display, and the user. The actual objects that will be encountered in a particular display may be thought of as instances of these general classes of objects whose properties and relationships are input during the grid design phase. The system currently supports pictures, text blocks, and headings, which the user must further scrutinize by designating limits, on their expected size and contents.

By generating a grid first and using it to produce multiple layouts, we gain one of the important advantages of grid-based design is consistency. Each layout of a set is not optimized as an individual design problem, but bears a visual relationship to the others. Not only do we gain efficiency in not having to redesign each display afresh, but the use of a common layout format visually enforces the relationship between the displays. Furthermore, the regular spacing of the grid, and hence the regular sizes and positions of the objects embedded in it, also helps achieve a coherent, consistent look for an individual display.

The input includes a normalized size for the pictures. This normalized size specifies the minimum width and height that the picture must have in order to be understandable when viewed at a set distance. In conjunction with the viewer's distance, it determines the actual minimum size at which the picture must be reproduced. The vertical space between the grid fields must also hold an integral number of lines of text, although it includes leading above and below the first and last text lines respectively. This approach allows a passage of text to span multiple vertical grid fields, while still maintaining the same relationship to the top and bottom lines in each full grid field. If a picture does not exactly span an integral number of grid fields, it must be further scaled and/or cropped. Cropping thus involves uniform scaling of the material in the extent if the aspect ratio will correctly span full grid fields or actual expansion of the extent vertically or horizontally.

Creating a prototype display layout does not produce any graphical output immediately. It needs to be tested and examined to achieve intended effect as an outcome and subject demand. As per the prototype display layout has been created, it can be used to determine the layout of one or more actual displays, based on a description of the input objects of which they are composed. This input consists of a list of object instances, the prototype class with which each is associated, and the actual contents of each instance (which must be consistent with the originally provided descriptions of their prototypes). Each object is then sized and positioned using information generated for betterment during the creation of the prototype display layout. This is how the layout design would be ready to print for the communication of the subject through flexible grid system process.

CONCLUSIONS

The process investigates the automated layout of graphical displays. The work described here is a preliminary implementation of one part of a structured method for generating both layout and information content together in arranging effectively. It has been used to explore the rule-based generation and use of a graphic design grid that governs the display layout process easily. Because the system is intended to be provided with the actual items to be laid out, it is not responsible for choosing the high-level display design style that determines the identities of these objects.

Further to this approach, it inspires to develop strategies for developing prototype layout design that involve more careful pruning of the layout alternatives generated, back tracking to avoid the exponential growth of the design sensitivity, space, type, image and improved criteria for evaluating design alternatives. Although the current system can handle only an extremely small subset of poster design in initial stage. However, further it has room to develop deeper to implement effectively for book design and many more subjects related to graphic design. Therefore, it is an attempt to provide a framework in the form of grid template for the purpose of creating an effective layout system, in one of the graphic design areas.

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