Pragmatic and Intuitive Approaches to Design Drawing:
The Essential Role of Imagination in the Visualization Process

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Abstract

The goal of this paper is to introduce themes and approaches in contemporary visualization that engage the imagination of the author and audience to enhance the larger creative process. Analog visual communication, defined as hand-generated sketches, diagrams and narratives, is of especial interest as it can bring powerful perceptual and conceptual processes to bear in making inferences and subsequent decisions. While there is a great deal of interest today in using the capabilities of computers to provide dynamic displays that provide a rapidly changing picture of the subject, many prefer static displays, comparing stationary before-and-after representations to draw inference about change. The forum for this paper precludes comprehensive discourse of the current trends in visualization, the role of technology and the necessary preservation of sketching for the design process; therefore, we only provide a cursory understanding of our approach. Currently, we are working on a compendium of drawing materials to manifest in a tentatively titled book Methodology of Visualization: Analog Visual Communication for People Who Create Things anticipated in the near future.

Introduction

A challenge among the various design professions is communicating the value of the creative process. As “design” becomes a commodity, the role that designers play becomes increasingly important. It is necessary to incorporate designers, clients, and colleagues early in the design process to enable greater ownership of the program and support for ideas. Thus, designers, key agents for shaping the visual world, have a tremendous amount of responsibility. Historically, a tragic pitfall that is all too easy to replicate, is to incorporate a designer late into the development process to decorate the surface of a product or to merely “sprinkle some design” onto an ill conceived form. To combat this problem, designers must justify their presence at the “grown-up” table and obtain enough elbow room to flex their creative muscle. Without limiting designers to form-givers and picture-makers, perhaps the most direct way is to “speak” visually by delivering visual documentation at every junction in the design process. In many ways, designers must educate others about the limitless opportunities a problem presents and myriad of potential solutions. The vital role then of imagination is to make ethereal and abstract ideas concrete in a compelling and universal way, expanding the perceptions of allowable and appropriate solutions, but avoiding pure fantasy. Imaginings made concrete through visual depiction are dependent upon the belief structures of both the author and the viewer. To gain credible latitude, criteria touch points must be observed and delicately expanded. In summary, the imaginative must challenge and inspire, yet address constraints to best connect the author’s experience or thoughts to those of the viewer.

As part of the larger collaborative design process, drawing serves as a primary method for thinking, reasoning and exploring opportunities. Innately we employ a variety of methods of representing knowledge, both internally in a cognitive sense and externally in the devices we design to store, exchange, and manipulate knowledge. (Whitby, 67) Sketching and diagramming both symbolic and analogical mirror an idea in a potential state using color and imagery to symbolically connote materials, transitions, features, and parts. Therefore, the goal of design drawing is to provide visual information in a concrete and overtly visual fashion to enable a focused discourse to emerge around the subject. Visualization, another term for design drawing,
centers on quickly communicating the multitude of qualities of a subject by abstracting the world into a series of geometrical forms, amorphic transitions, materials, textures, and tones. Differing from fine art drawing, which emphasizes the accurate rendition of something viewed from life to elicit an emotional reaction from the viewer, visualization centers upon communicating the essence of an idea that is not yet realized in physical form. The intention of visualization is to communicate and convey the essential attributes and qualities of an idea to enable subsequent judgment, critical evaluation, and action. This paper will discuss the essential role that “imagination” must play in visualization as part of enriching the larger creative process. Our goal is to demonstrate methods for developing highly communicative drawings through both intuitive and pragmatic approaches that will enable one to become a better visual thinker and communicator, not a master illustrator.

Anatomy of the Analog Sketch: A Visualization Primer

Drawing styles are like handwriting in that they are highly personal and can speak volumes about the character of the author himself. Excessive stylization or flair can detract from the image as non-essential elements, color and lines create visual “noise” that masks the drawing’s intended purpose. Similarly, stark black and white line art can appear uninteresting or worse, unfinished. In our work, we view design drawing as an essential vehicle for communication with ourselves, our clients, and our students; therefore, we have developed parameters for our approach that we believe, yield an appropriate balance of visual elements and information.

Since the terms “sketch,” “drawing” and “visualization” are commonly interchangeable, we can classify them into a category identified as “analog visual communication” or the less poetic, “hand-generated images done with physical tools.” While the concepts we will discuss can be (and should be) implemented across digital platforms, the expediency and impact of a hand executed sketch carries intangible “magic” that alludes to the innate talent of the designer and can engage the imagination of the viewer. Digital methods can have similar qualities, yet currently are still viewed by many as a product of a particular software package rather than of the designer’s adeptness. Furthermore, digital methods inherently have greater communicative implications in that they appear to be more complete, have taken more time and money to generate, and present far fewer opportunities for change. Thus, a
contemporary challenge is the preservation of the intrinsic qualities of the analog approach with the benefits and flexibility that digital affords.

The goals of visualization and sketching are 1. To externalize and convey the process of thinking--to transform intangible ideas to tangible knowledge; 2. To reveal ideas, not results; 3. To engage discussion around the subject/problem; and 4. To experiment and search for appropriate avenues to resolve form and functionality. In short, visualization is the physical record of design thinking. The images that result from this process serve as vehicles to bring others into the designer’s mind to better facilitate collaboration. To achieve the objective of communication, certain structures must be observed to provide flexibility in variables of media and style.

General Structures

Visualization differs from ideation because it is intended to have an audience and to be presented in some public forum. Ideation, or the quick jotting down of ideas into loosely connected doodles and isolated sketches, only serves to connect with its author because it inherently lacks the visual connections necessary to illustrate a complete idea. Successfully externalizing ideas through visual means hinges upon the transparent themes of intent, composition, and reduction. A drawing or series of sketches with “intent” clearly demonstrates focus and purpose, and with a quick visual assessment, can tell the viewer exactly why they are looking at it. Developing a structure to the visual organization of the page is also an essential part of making a drawing communicative. It establishes order, balance, and hierarchy. Invisible or implied grid structures can help ensure the proper amount of white space, proximity, textual support, and emphasis. Furthermore, the reduction of visual elements accentuates the difference between presentation sketching and ideation by filtering ideas, limiting the amount of information one presents, and improving overall impact.

Specific Variables

Transparent structures provide an underlying framework that enables flexibility in variation of line quality, tone, color, and details. With a competent underlying system, the emotive qualities of materials, style and drawing quality will be more cohesive. Disproportionate drawings that center on material variables without a solid underlying foundation, often fail to communicate the value of the intended design idea. Viewers can become distracted by haphazard or chaotic arrangements and only appreciate the drawing for its superficial visual qualities. The goal is to find an appropriate balance of these material variables within the established framework.

Variation of line weight can be effective in delineating details and surfaces. A thin line weight will provide a solid base for a drawing because it can then be enhanced with thicker pens. Viewing distance of the audience and methods of potential reproduction (copier, fax, digital camera) should be considered. A current trend in design drawing is to assign a heavier outline to the silhouette of the object. While the intention is to provide some form of emphasis to the image, outlining only serves to flatten the image. Instead, bringing some heavier weighted lines to the interior structures of the image will aid in defining geometries and perspective by complementing the accented area of the outer form. The goal of line weight is to define the form in a direct manner with few strokes; scratchy, stuttered lines should be avoided for smooth, controlled line work. Lines should start and end at very specific points to appear clean and descriptive.

Tone and color are important variables to limit. The more tone and color assigned to a drawing, the more information it represents. For simple sketching, a couple of gray markers and one or two accent colors may suffice. Using shades of grays rather than colors to define surfaces and volumes speaks more about the form of the object than its material qualities, thereby implying
latitude for changes to the idea. A limited pallet with specific accent colors can yield a more communicative drawing as a hierarchy of information is constructed. In addition, using cast shadows can provide a needed degree of reality and context to drawings. Shadows are rendered in black or dark gray and are, in many instances, used to visually lift the object from the page.

Details such as arrows, diagrams, vignettes, and notation must maintain the same feel and style as the drawing. Arrows can be playful, technical, quiet, loud, have volume, and cast shadows; however, they are always created to support the primary information. Detail arrows describe a point of interest and are usually located with text. Action arrows show movement and direction and are usually drawn in orange to connote the idea of energy or motion. Vignettes serve to relate objects to each other, group information, and reinforce composition. Notation supports the images best if formatted with an invisible grid and written in architectural style lettering.

Visualization for Communication: A Narrative Process

Using visual methods to communicate ideas entails creating a sub-structure of non-verbal communication. Too often do designers make hasty, unrefined drawings that must be laboriously overexplained to colleagues and clients. The very premise of visualization is that the work, rather than the author, effectively and completely communicates the main ideas of the concept. The work must sequentially reveal information across the picture plane in an orderly and scripted fashion. A narrative substructure built into the organization, hierarchy and composition of the piece will enable the nonverbal story to unfold. Narratives, which provide accounts for telling the story of events, experiences and ideas, offer concrete touch points for viewers with a sequential format divided into three distinct parts—beginning, middle, and end. Simply, the viewer will immediately recognize a starting point, a main body or collection of ideas, and an ending point to provide a comprehensive visual discourse of the concept. We often make a key distinction that sketching is the visual record of multiple ideas (i.e., idea sketching), whereas visualization is the discipline of making seamless visual connections among these ideas. The differentiation of the two terms enables the use of narrative structures that lead the viewer through the drawing space and deliver ideas with greater impact. Regardless of the particular emphasis, pictures somehow possess a faster access than words to a common conceptual system. Picture-word latency
differences stem from a time-consuming translation from one symbolic code to another, and that semantic information required in the subsequent decision tasks is typically stored non-verbally."

(De Linde, 121)

Visual narratives can take many forms – from a page of loose sketches around a common theme to a highly resolved presentation rendering. Maintaining a sequential structure will provide cues for orientation and establish some form of closure. The format of visual narratives is similar to that of a standard product commercial, where a problem arises, is addressed, and is resolved in a specific measure of time; all presented in an engaging way. By structuring parameters for the viewing experience through composition and hierarchy, the body of the work can manifest in a multitude of ways. Again, the ultimate goal is to communicate ideas and thinking to others. Visual narratives can also speak volumes about the design/creative process. Since drawing and design thinking may be foreign concepts for most clients, the designer can utilize such techniques to “educate” others about their process. It is here that the visual narrative serves to invite the audience into the designer’s mind and establish trust or belief in creative decision making.

To properly structure a visual narrative, the author must know to whom they are communicating in terms of knowledge of the subject, familiarity with design processes, and visual/aesthetic sensitivity. Understanding both the character of the audience and the format for presentation will keep the narrative focused and succinct. Again, a narrative must have intent; meaning that it must have a clear and definable purpose to facilitate subsequent discourse around the subject. Without intent to further the design process, visualization functions more like fine art drawing as a visual record or stylized representation of the idea; a dangerous scenario where it is not working as part of the thinking process.

Visualization and Imagination: Leveraging the Intangible

The mind’s eye is incredibly adept at revealing an inner vision that transcends the constraints of time and space. Manifesting in seemingly unbridled creativity, pictographic outcomes from imaginative exploration yield greater connections to tie the mind to the subject in more distinct and expedient ways. Images created in the intangible, yet apparent mind’s eye prove to be elusive and easily lost to awareness and self-consciousness unless properly realized through physical record. Once recorded, drawn images feed back to the mind’s eye to further stimulate imaginative processes and perpetuate a dialogue between self and the image.

Although mental images often appear spontaneously in response to sensory perception (something heard, touched, tasted, smelled, or seen), we have the innate ability of envisioning recollected or imagined images through the mind’s eye. Often through the latter stages of a drawing session, one might become aware that their mind is simultaneously processing the images drawn in front of them, making connections to previous experiences, mental records, or stimuli in the immediate environment and is forecasting the hand’s next move. It is during this mode that ideas tend to flow effortlessly from the author’s mind to the page. While imagination is predicated on visual memories, it is also incredibly suited to look forward in time to visualize a
possible future. Imagination, therefore establishes connections to the current experience through visual bridges among the past, present, and future.

It is important to note here that there has been some debate in various philosophy and psychology circles about the distinction between ‘imagining’ and ‘visualizing.’ Noted philosopher and author Alan R. White, wrote that “Visualizing and imagining are quite different concepts in the way that talking and thinking are different concepts. One can imagine, but not visualize, the non-visual, and even the non-perceptual, just as one can think, not only without talking in English but even talking at all.” (White, 109) While these terms may differ slightly in meaning, for the purposes of relating the role of imagination to the visualization process as designers traditionally know it, we can operate from a typical dictionary definition:

**imagination** (n): the power of reproducing images stored in the memory under the suggestion of associated images or of recombining former experiences to create new images; a mental conception or creation, often a baseless or fanciful one; ability to meet and resolve difficulties, resourcefulness.

In reality, the activity of visualizing ideas is a combination of perception and imagination. When sketching, we usually start with the concrete; then throughout the process of drawing, we relax constraints to abstract and emphasize what is important to us. As a highly purpose-specific process, representing knowledge in a visual manner must maintain a flexible and elastic process rather than some formalized representational approach. Therefore, as such an ad hoc and ephemeral method of communication, designers can generate a number of small, temporary representations that can easily be picked up and utilized. (Whitby, 78) Hence, the drawing serves as a visual map of one’s thinking process – how they see the world and perceive what is important to them at a specific moment. Visualization then is the exercise of an ability to visually describe ideas based on knowledge gained from awareness, which may be easy or difficult to manifest on occasion or at which some may be better equipped than others. What one has visualized, as what one has in turn depicted, is not only some material object, existent or non-existent, but something whose identity depends not wholly on what it looks like but on what one intended it to be. (White, 122)

Del Coates stated in his recent book, *Watches Tell More Than Time*, that designers are equipped with artist’s antennae to sense what lies just out of range of normal sensibilities—designers (and artists) resonate with social and cultural forces that exist in the ether and remain undetectable by normal people. Designers build a mental catalog of these factors that collectively serve as fodder for the next creative decision. Hanks and Belliston wrote in their popular book, *Rapid Viz*, “a mind
filled with knowledge, experiences, and an acute observation of the surrounding world is more apt to bring forth creative ideas." (Hanks and Belliston, 122) Hence a designer’s greatest asset is to work this memory bank into useable visual expressions of ideas, to challenge their imagination to change thinking, and to persuade viewers in the value of abstract approaches. Integrating elements of fantasy can indulge the imagination of the viewer through effortless projection to challenge their pre-conceived notions about the subject. A convincing argument with imaginative elements can be wide in content; however, imaginings alone are too weak to stand on their own and need the support of a factual belief structure (design criteria) with strong, reference-inducing relation to the world. (Currie and Ravenscroft, 19) Including imaginative elements to expand the norms of a given project can only work if the rudimentary requirements of the problem are addressed. Often, we approach client meetings with a variety of potential solutions to any given design problem. First, we address the expected outcome or the client’s desire to see a visual depiction of their anticipated solution—the mental image they had before they handed over the project; and secondly, we expand the criteria to offer ideas that shake the very premise of the design problem to ignite discussion. For instance, if a client asks for a high chair concept, we might question the very dynamics of integrating children into the dining scenario; their relationship to their parents and the greater environment. Sometimes called “blue sky” ideas, imagination is used to move the problem space from a myopic view of the problem (make another high chair) to more of a panoramic view where the landscape of the problem is identified (how children eat at the dinner table). The ultimate goal of this activity is to prime the audience or client’s thinking to accept an idea that sits in between these two extremes—that advances the current state of design in this problem space, challenges conventions, and improves the state of the world (or the experience at least). Therefore, one can leverage imagination to create new and interesting outcomes.

Visualization with Intent: A Pragmatic Approach

Two effective methodologies in visualization exemplify pragmatic and intuitive approaches. The former being a systematized method for generating ideas in accordance with itemized design criteria. The latter, a more flexible approach, can be used to look at the big picture and global relationships.

The pragmatic approach to idea development uses image boards to gain inspiration from existing ideas. From these boards, select images are mapped across the x-axis of a matrix to inform the visual relationships in the systematic generation of new concepts. The y-axis is then pre-set with configurations and specifications to focus the functional relationships. This approach yields a highly focused set of explorations that are clearly organized and arranged for presentation. In addition, this method also allows for development in the z-axis as ideas develop in permutation and are stacked dimensionally. Each sketch in the morphological sequence serves as a diagrammatic representation, encodes relations between variables, and exemplifies an instance of relationship within the given parameters of the matrix.

Fig. 5. The “pragmatic” matrix method yields a focused set of explorations that are clearly arranged for presentation.
The resulting matrix maps the landscape of potential ideas, strictly constrained within given boundaries of the design problem.

Formalizing an idea generation process may seem counter-intuitive for designers who can freely visualize and record their ideas with speed and accuracy. However, for many, including much of the student population, the open-endedness of design problems presents challenges when conceiving forms. A current paradox exists where we now have the manufacturing capabilities to realize any form imaginable, yet we still struggle with developing the most satisfying and appropriate forms for the problem at hand. Transforming strict problem criteria into visual reference points that help guide the form development process can focus creative efforts and make relationships among disparate images to yield new and interesting forms. Therefore, a planned approach can provide necessary boundaries for operating in the problem space and minimize fear of making a misguided move. The resulting visual matrix shows variations along themes, and if exhaustively explored, will display a systematic morphological sequence of subtle changes in both gestalt and configuration of elements.

Image 6  The inherent flexibility of the “intuitive” approach enables the author and the viewer to more freely engage with ideas as the free-flowing format appears less rigid and scripted.
Visualization with Latitude: An Intuitive Approach

The intuitive approach is used to generate sketch narratives where basic ideas are explored laterally to make abstract relationships. Often these sketches appear as a stream of consciousness where many ideas are presented in a seemingly random order to generate a global message. The impact of the visual image stems directly from the sum or volume of drawings with minor connections among them.

This informal, right-brained approach may be more enjoyable as it enables serendipitous conclusions and feels more like a natural fit for the creative intellect. The inherent flexibility enables the author and the viewer to more freely engage with ideas as the free-flowing format appears less rigid and scripted. As part of a larger collaborative process, this approach promotes dialog and exchange of ideas. Frequently used in our respective drawing programs, students resonate with the ability to work together in brainstorming ideas, working out details, and responding to ideas in the non-critical and non-verbal way this approach affords. The real value is apparent with subsequent discussion of the artifact and of the various design decisions of each participant.

While the appearance of this approach is less formal, the method for creating it is perhaps more rigorous than our pragmatic approach. To ensure proper communication, the work must have a clear progression of ideas and direction for reading. Furthermore, milestones must be clearly marked as important ideas are presented more obviously to reinforce the sequence. Transitional connections must be made apparent to “seed” each marker, hint at a potential direction, and to provide a visual dialog of the evolution of the major concept. The result will yield a tightly woven and layered sequence of elastic adaptations, poignantly expressed by marked plateaus and further accentuated by a pronounced differentiation from beginning to end.

Conclusion

Designers can and should make the creative process inclusive, where they can become the key agent for decision making. While other disciplines are comfortable operating with myopic views of the world, designers need simultaneous global and local views of the problem landscape. It is here that designers can leverage their creativity to capture the imagination of their audience (client, colleague, etc) and to realize potential solutions that are unique, impacting and socially significant. Both the pragmatic matrix and intuitive narrative methods rely on two essential components: intent and
imagination. Without intent, these drawing solutions would be unfocused, aimless, and inappropriate. Intent will keep the drawing on target and focused for its specific role in the greater development process. Imagination, an essential part of being a creative thinker, builds on prior experiences without becoming formulaic and provides the ability to project abstractly beyond the criteria of a problem to investigate original solutions. While imagination and fantasy can sometimes derail focused investigation, they can illustrate the potential of an idea and challenge the very essence of the problem. Through the two methodologies, designers can leverage their imaginative capabilities to emphasize potential outcomes and relationships; thereby illustrating their thought process.

References


