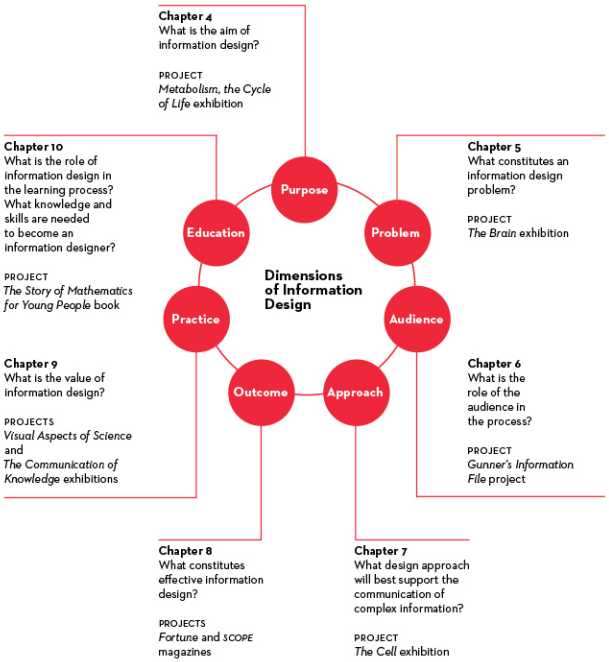
Diagram 3.1
Dimensions of information design including
Will Burtin's projects relevant to each.



A Designer with an Information Priority

Most of Burtin's work while living in the US involved translating military tasks and cutting-edge scientific research in pharmacology, microbiology, biochemistry and nuclear physics into visual forms (such as publications, graphics and exhibitions) so that they would be easily understood by both experienced audiences (medical doctors, scientists, Air Force and Navy servicemen) and novice audiences (general public and students). He also taught design, and was active in organizing significant design conferences. Working on a variety of design projects challenged Burtin to broaden his understanding of the potential role of the designer. Although he intuitively applied information design principles to his work, his thinking, processes and skills evolved with each new project, as he became a designer focusing on enhancing communication.

3.1
Understanding, the Foundation

Throughout his practice and in his writings, Burtin fostered the emergence of a new design specialization called *Integration*. He described it as "a comprehensive and anticipatory activity… concerned with *all* problems of understanding."[1] This definition coincides with the core aim of contemporary information design as stated by various current authors, including Wurman,[2] Tufte,[3] Pettersson,[4] and Frascara[5]: to enhance understanding of a situation, concept, space, place, time, quantity, phenomenon for an intended audience.

Furthermore, information design is a multidisciplinary practice[6] aimed at helping people achieve their goals by translating raw data or disorganized content "into forms that can be rapidly perceived, understood, processed and used."[7] Information design draws from a range of academic disciplines related to making sense of and visually communicating content. These include graphic design, communication sciences, user experience design, cognitive science, perception, applied psychology, and information science and management.[8] Information design solutions encompass print, digital, environments, exhibitions, and experiences, but in all cases, the creation of visual forms or visualizations (e.g., diagrams, graphs, maps, 3D models) are an intrinsic component to translate and convey information.

Image 3.1
Principle 1
Clear definition of problem.
Information graphic from SCOPE magazine indicating the components involved in transplanting gut segment, 1955.

Image 3.2
Principle 2
Well-defined hierarchies.
Diagram from SCOPE magazine showing regulation of blood glucose by pancreatic hormones.

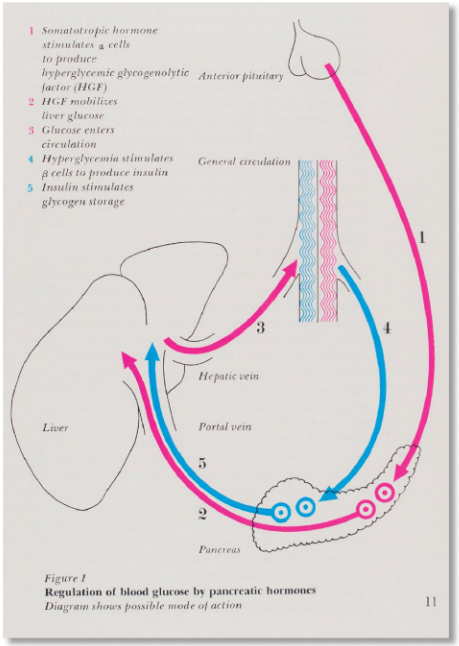
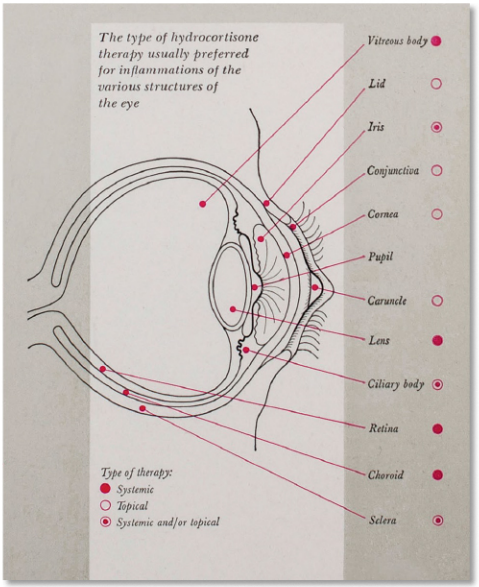


Image 3.5
Principle 5
Purposeful use of visual variables.
Diagram from SCOPE magazine showing the type of medication (systemic, topical, both) preferred for lesions of various structures of the eye.



In order to achieve effective solutions, information design principles and research need to be followed by a designer with a curious and active mind, and a willingness to ask critical questions, investigate and learn. However, as Sutnar asserted, the solely mechanical application of graphic design principles will not produce high quality designs. To apply the principles effectively, designers should understand their values and meanings.[30] Burtin's design process, examined through Process Boxes presented in Chapters 4 to 8, demonstrates these qualities and the required understanding of the principles. To him, "form [was] not necessarily an added factor in this process, but a result of all previous considerations."[31] Burtin combined patient research and brilliant inventiveness to distill complex content into comprehensive, functional, simple and organized solutions. His legacy brings design closer to science, and adds value and credibility to information design.

3-3
Information Design's Need for Scientific Thinking

In 1967, Burtin stressed the need for visual communication to move beyond a designer expressing his or her personal style, to being concerned on a larger scale with the problem at hand. This in turn may have opened the door to making information design more common in other industries. Since Burtin's professional design years, many changes have occurred. Information design skills are valued across most industries, and professionals with these skills are in high demand to tackle the complexity of current challenges.[32] Institutions and organizations in various disciplines convey information in visual form for different purposes: to aid teaching and learning, to support the communication of ideas and unseen processes or thoughts, to improve the use of data, etc. Burtin would see this current phenomenon of design that connects commercial, technical, scientific and social requirements as making "the designer an essential partner in basic business planning rather than [someone simply] providing aesthetic pleasantry incidental to business."[33] Furthermore, information design has increasingly played a key role in facilitating better understanding across disciplines such as marketing, healthcare, finance, science, wayfinding and education.

Some of Burtin's ideas regarding the consolidation of "the new discipline in design"—Integration—remain unaddressed.[34] In other words, some key dimensions of the information design process are still not receiving the attention they deserve from the design community. Although Burtin felt that the visualization of scientific content was not an opportunity for self-expression, many information designers do follow an artistic approach to problem solving[35]; drawing and sketching are the core actions, and rigor and accuracy are relegated to second place or completely forgotten. Even when finished, information design work shows precision and engaging graphics, but the work may not be effective if the process that was followed wasn't systematic or rigorous, the design wasn't well thought through, and decisions weren't informed by research evidence. Not following the process that was suggested by Burtin results, more often than not, in solutions of poor quality or ineffective communication.

So, despite the current increase in the use of visual forms, effective communication and understanding are not always achieved. When design actions are performed without a rationale, and good decisions are made by accident, the resulting visualization of complex subjects can seem impenetrable to both the non-scientist and the expert.[36] In the contemporary scene, this frequently occurs because "there is too much emphasis on the production of design outputs and too little attention paid to the fundamental understanding of problems and people."[37]

Twenty years ago, British design researcher Nigel Cross said that the increasing complexity of design problems demanded the adoption of new or different problem-solving approaches.[38] Burtin's approach to visualizing scientific information, developed more than 60 years ago, could today provide the missing level of rigor and add the necessary scientific layer to the processes of contemporary design practitioners.

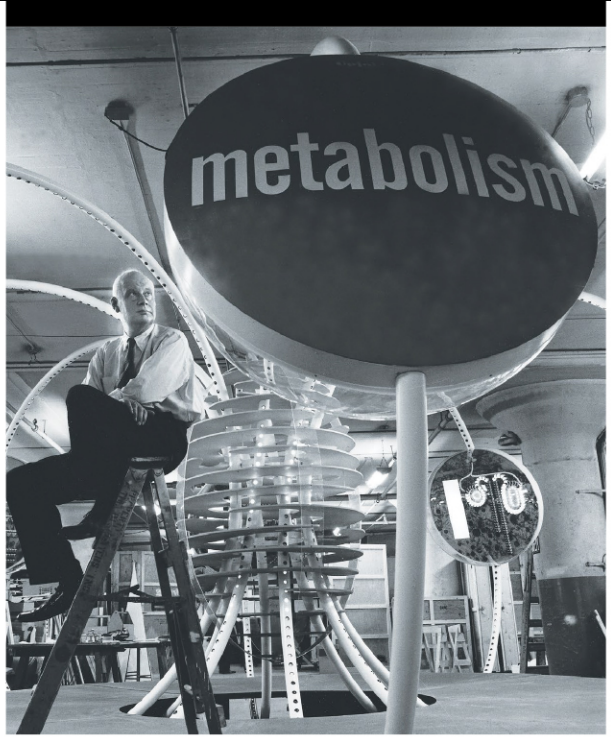


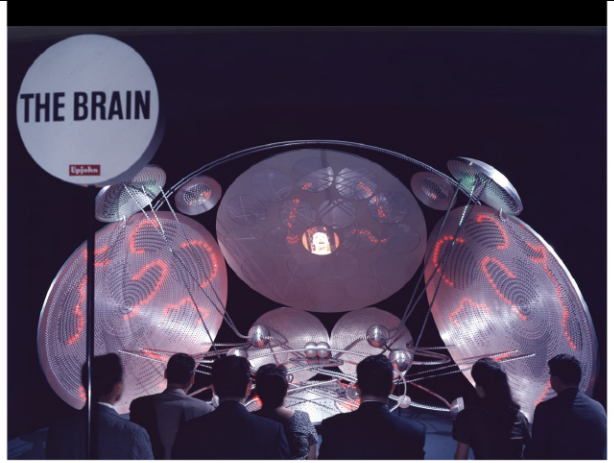
Image 4.1
Will Burtin with the *Metabolism, the Cycle of Life* exhibition for the Upjohn Company, 1963.

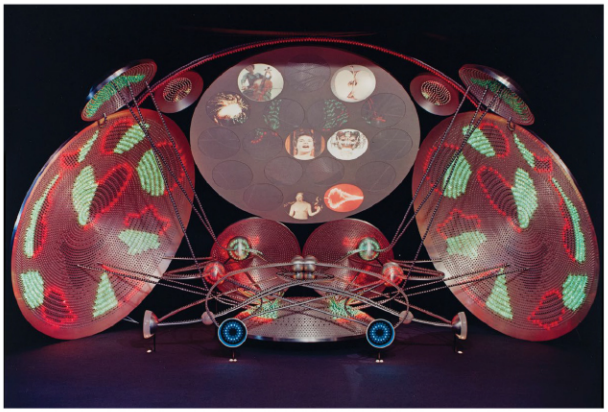
Purpose

4.1
Facilitating Understanding

For Burtin, "the real difference between 1920 and 1966 [was] that the problems of drastic simplification and clear exposition assumed a far more pressing relevance." Clear exposition was critical to Burtin because of "increased communication density, greatly extended range and [the] inescapable present."[1]
In 2021, the complexity of our society's problems has grown exponentially and our need for clarity and understanding has become even more pressing. Complexity, a constantly evolving phenomenon, has always been manifested throughout history. But how individuals perceive and deal with it has changed from one time period to another.[2] This does not mean that, while complexity is an intrinsic part of life, "the confusion, ambiguity and lack of understanding that may result from [it]" are somehow necessary.[3] Instead, information designers can help make sense of complexity by bringing order to confusing and ambiguous situations.

Burtin maintained that designers can understand problems and gain exciting insights into them "through unceasing comparison and interrelation of factors" that then enable them to "depict even that which had been invisible."[4] Information designers can lead the way to understanding by "encouraging awareness of connections," which will then facilitate the identification of patterns.[5] When designers break down complexity, extract its essential elements, and communicate those elements through visual means, people can more rapidly digest and process complexity.[6]





Images 5.2 and 5.3
The Brain exhibition, 1960.

5.2
***The Brain* Exhibition**

Burtin designed *The Brain* exhibition for the Upjohn Company in 1960, for installation at the American Medical Association's annual meeting in Miami Beach, Florida. The exhibition was not an anatomical model, because the main goal was to represent mental functions and the role of time in consciousness and the evolution of thoughts. Explaining "the temporal aspect of brain function" was particularly relevant because scientific research had just revealed that time was the essential factor to understand the steps needed for a thought to emerge.[7] Burtin designed the exhibition to help the average doctor and the general public become acquainted with the most recent scientific discoveries about the human brain and its sensory functions. Viewers would not necessarily need to have anatomical knowledge to understand how the brain works, according to Burtin.[8]

Secondary research on the topic and talks with content experts helped Burtin redefine the problem, and led him to make appropriate decisions based on the project goals rather than on his personal preferences:

> From the beginning of this project, the integration of *all* senses of perception–sight, hearing, smell, taste and touch–in one model was tempting. In the course of research and construction, I had to accept with reluctance the fact that it would be extraordinarily difficult to harmonize this intent with the demands for clear and understandable communication.[9]

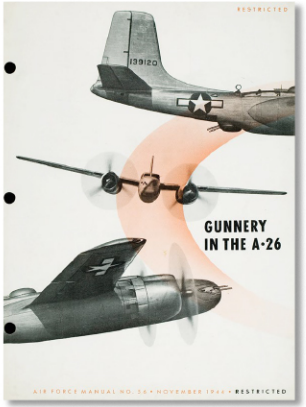
Based on his learnings, Burtin determined that the model should restrict "the number of senses, involved in the functional evolution of the thought process, to the two most essential senses–visual and auditory."[10] This decision would prove to be a good one, since viewers could then better understand the internal structures and functioning of these senses.

With moving lights and flashing images, the exhibition visually explained the relationship between consciousness and thought. The viewer's journey began with an audiovisual display of a moment at an opera, projected on a screen. Standing in front of the exhibition, the viewer used headphones for audible information and cues. Inputs coming in through a person's eyes were depicted by two shallow hemispheres or saucer-like structures, and through the ears, by similar saucers placed to the outside and below. These inputs then moved "through elaborate circuitry to various centers of the *Brain* such as the midbrain (the dome-like structure at the bottom), the visual cortices (top, left and right) and the memory cortices (pair of large discs on left and right)."[11]

This experience of sound and sight showed viewers how the human brain works by simulating mental functions that help generate thoughts and judgments. The model itself reacted to these visual and auditory impulses, coming alive to show how a real human brain would process sight and hearing. This audiovisual journey allowed the viewer to experience a feeling similar to "a brief moment at a concert."[12]

> Locations and distances were so arranged that an observer could follow motion and timing of colored light impulses. Selected for a theme was the experience of a singer and her song, both familiar to most people. The sounds and description of the auditory aspects of the experience could be *listened* to over earphones placed near seats around the front of the exhibit, while the motion of green, coded *sound impulses* could be followed visually in the model. The visual aspects of the experience could be seen throughout the performance, as they were cross related to memory flashbacks, and resulted in the final recording of the specific image as red, coded light patterns in memory cortices and midbrain, next to the green patterns of sound.[13]

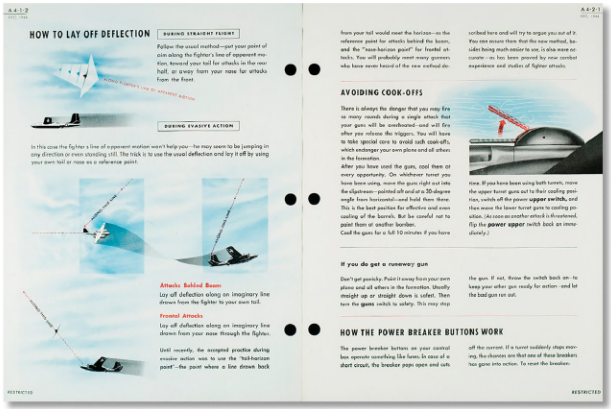
Image 6.3
Cover, *Gunnery in the A-26* manual, 1944.



***Gunnery in the A-26* Manual, November 1944**
The manual for the A-26 described the airplane's key features and the characteristics of new gunnery equipment, the gunner's compartment, how to adjust his sight to use the periscope, specifics on how to use the guns when in combat, steps to get ready for a mission and how to harmonize the airplane (unify all the technical systems). At the end of the manual, to ensure that all the necessary protocols had been followed correctly, four checklists were included, one for each step in the experience: pre-flight, in air, before landing and post flight. In the manual, this information was logically presented in seven sequential chapters:

- The A-26 and its guns
- The Gunners Compartment and its Switches
- Sight
- The A-26 in Combat
- Getting Ready for the Mission
- Harmonization of the A-26
- Check Lists

Image 6.4
Inside pages, *Gunnery in the A-26* manual.



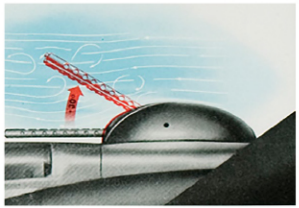
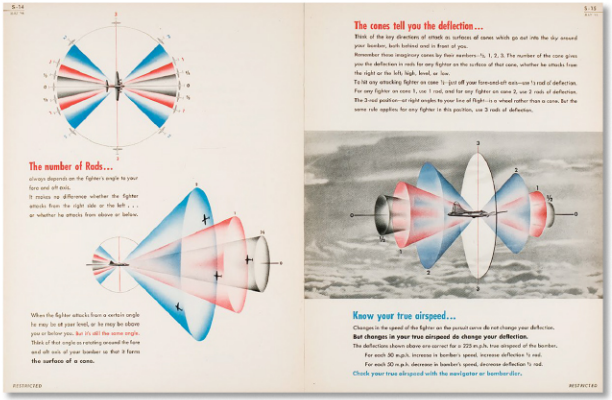


Image 6.13
Inside pages, *Position Firing* manual.



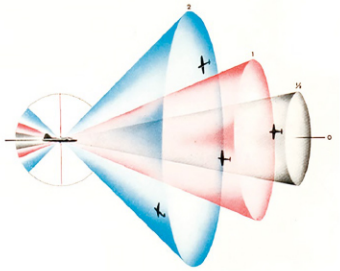


Image 6.14
Inside pages, *Position Firing* manual.

Image 7.10
Inside pages, *The Cell* brochure.

Images 7.11 to 7.13
Inside pages, *The Cell* brochure.