دور الرسوم المتحركة في تعزيز فاعلية تصميم الإنفوجرافيك

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The role of motion graphics in enhancing the effectiveness of infographics design

Dr. Hussein Mohammad Al-omari - Middle East University, Amman - Jordan

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الملخص

الهدف الأساسي من الإنفوجرافيك كغيره من الوسائط البصرية هو تلبية احتياجات وتوقعات الجمهور من خلال تقديم المعلومات بطريقة منطقية وسهلة الفهم مع الاخذ بعين الاعتبار كمية المعلومات المقدمة. وقد أسهمت التطورات الحديثة في تقنيات التصميم الجرافيكي في جعل العديد من الأساليب المعقدة في متناول المصممين، مما رفع من مستوى العملية التصميمية لتصبح مهنة متقدمة تتجاوز حدود الوسائط التقليدية. يحمل الانفوجرافيك الثابت والمتحرك نفس المحتوى، إلا أن الانفوجرافيك المتحرك يتميز بقدرته على عرض المعلومات من خلال الحركة المستمرة والتسلسلات المتحركة بدلاً من العناصر الثابتة أو المراحل المنفصلة، وذلك بفضل الخصائص الفريدة للرسوم المتحركة التي تجذب جمهوراً أوسع، مما يجعلها أكثر فاعلية من الانفوجرافيك الثابت. أما الانفوجرافيك التفاعلي، فتقدّم المحتوى ذاته، ولكن من خلال تجربة متعددة الحواس، تتيح للمشاهدين التفاعل مع المادة المعروضة عبر النقر أو التمرير أو اختيار أجزاء محددة، كما أنها تدمج الصوت والفيديو والصور الفوتوغرافية لتعزيز تفاعل الجمهور. وتهدف هذه الدراسة إلى تقييم فاعلية تحريك عناصر الانفوجرافيك باستخدام أساليب وتقنيات التصميم الحركي لتقديم معلومات ورسائل دقيقة، ممتعة، فريدة، وسهلة الفهم.

الكلمات المفتاحية: التصميم المتحرك، الانفوجرافيك المتحرك، التصميم، الانفوجرافيك، مبادئ التصميم.

The role of motion graphics in enhancing the effectiveness of infographics design

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Abstract

An infographic's primary objective is to satisfy the demands and expectations of its audience by presenting information in a logical and intelligible way. Recent developments in graphic design techniques have made several intricate techniques approachable by artists and designers, elevating the design process to a sophisticated profession that transcends media boundaries. Static infographics and animated infographics feature the same material; however, animated infographics have the benefit of displaying information via continuous motion and animated sequences rather than in static components or separate stages, and that's because of the special features of animation, which attract a wider audience. They are also more effective than static infographics. Interactive infographics present the same information as the other two categories, but they offer a multi-sensory experience that allows viewers to interact with the content by clicking, scrolling, or selecting specific parts; they also incorporate audio, video, and photographs to boost viewer engagement. This study aims to assess the effectiveness of animating infographic elements using motion design methods and technologies to deliver precise, amusing, unique, and easily comprehensible information and messages.

The purpose of this study is to clarify the fundamental motion design techniques and how to use them while producing a motion infographic, and since motion design techniques make it easier to communicate information in a way that is accurate, captivating, unique, and understandable, they are crucial for improving the effectiveness of information and message delivery.

Key words: Motion Design, Animated Infographics, Design, Infographic, Principles of Design.

Introduction

An infographic is a visual representation that employs diverse pictures and text to elucidate and simplify intricate information for enhanced comprehension. Moreover, the primary objective of an infographic is to provide information in a coherent and comprehensible manner for the audience. Infographic design requires consideration of various critical components to guarantee the efficacy and comprehension of the presentation, and it must comprehensively grasp the target audience's wants and expectations and carefully select and analyze the colors from the color wheel to ensure they closely align with the infographic's subject matter. The designer should select and craft shapes that enhance comprehension of the material, ensuring the infographic remains visually appealing and easily readable. However, an effective infographic has clear and succinct wording that facilitates comprehension of the presented information. The infographic may include graphs and visuals to elucidate facts and information and enhance comprehension (Martins, Barreto, Santiago, & Lima, 2020).

Components such as icons, images, illustrations, and videos with a creative approach give the ability to utilize shortened text by enabling the content to be distributed in various digital forms and published on the social media platform (Kadir, Talip, Jalil, & Alhosani, 2023). In producing infographics, the designer must prioritize usability and comprehension; the infographic must be intuitive, offer a user-friendly experience, exhibit flexibility, and be comprehensible without written instructions and consistently succeed in elucidating the intended subject.

There are two conditions that must be met for the audience, which are that the visual object should stand out from the background and it should meet the viewer’s cognitive needs and be compatible with the memory of the image. However, an effective design begins with visual-task analysis, whose primary purpose is to identify a series of visual queries supported by the design scheme (Yang & Gan, 2025).

Research Problem.

Animated infographic designs have recently proliferated across multiple platforms; however, evaluations reveal several flaws that limit their reach and quality, as they often lack effective use of animation techniques, methodologies, and tools.

This problem raises the following questions:

- What are the essential motion graphics tools that enhance both the functional clarity and aesthetic quality of animated infographic design?

- How do motion graphics principles and rules contribute to the effectiveness of animated infographics in delivering information?

- How can the aesthetic and functional effects of motion graphics tools in animated infographic designs be assessed and measured?

Research Objective.

This study aims to evaluate the efficacy of employing motion design approaches and tools for animating infographic elements to communicate messages and information in an engaging, accurate, unique, and comprehensible manner. This study intends to elucidate the crucial motion design tools utilized and their application in crafting a motion infographic design.

Significance of the study.

The significance of the study resides in promoting knowledge regarding the proper principles employed in the creation of animated infographics using motion graphics techniques, specifically targeting university students in specialized courses.

Research Methodology.

The research follows the descriptive exploratory approach in order to answer the research questions and achieve its objectives. However, a questionnaire was designed to collect field data answered by designers and design experts, measuring the perceptions of their opinions about the effectiveness of animated design in

conveying information, facilitating understanding and recall, and the extent of user attraction and interaction with it compared to static infographics, in addition to their evaluation of the importance of employing specific techniques such as dynamic zoom, dissolve, and morphing in enhancing perception and maintaining the viewer's attention.

Infographic.

Infographics use diverse images to narrate tales, communicate concepts, or examine topics; they serve as a visual representation of intricate information, aimed at facilitating public comprehension and absorption.

The researcher asserts that the term "infographic" consists of two principal components: information and visuals, hence its designation as "information and design." Infographics serve as a tool to improve the reader's understanding of information by providing a clear visual depiction; several domains, such as education, media, healthcare, and research, utilize them.

Infographics serve to communicate a message and streamline the display of extensive data transformed into information for enhanced comprehension and retention. Typically, infographics incorporate charts, pictures, symbols, messages, and photographs, as shown in Figure (1). And there is a type of design that falls under the wide field of graphic design, where infographics convey complicated information and facts in an easy-to-understand, scientifically arranged, and artistically rendered manner.

Figure 1: Thailan flag road Infographic

Developing an effective infographic.

To create a good infographic, follow these procedures, which will simplify the designer's work (Ferreira, 2014).

- Choosing the infographic subject is crucial for its success, as it acts as a primary attraction for the reader or recipient. One may select contemporary or prevalent subjects, such as endemic illnesses or current conflicts. Choosing a suitable and compelling title is crucial. Just as every book or article has a title that captivates the reader, an infographic should also have a prominent and striking title that is both appealing and clear to the audience. The reader may resolve an interrogative statement while perusing the infographic. However, before converting the infographic into a digital format, create a paper draft by illustrating the storyboard.
- The more straightforward and succinct the information is, the more effective and successful the infographic will be.
- Employing graphics: When creating the infographic components, utilize several visual types, including pictures, charts, and, if required, maps.

- Identify the colors: In infographic design, it is essential to select colors that are pertinent to the subject matter of the infographic. For instance, the designer must use brown to design an infographic on coffee.
- Select the fonts: Like colors, the infographic designer must select font types that are appropriate for the subject matter of the infographic. The number of font types should not exceed two.
- Concise texts enhance the infographic's performance. The principle of infographics is transforming textual information into comprehensible visuals.
- Incorporate pertinent data: Information that is connected to and relevant to the infographic's subject must be included.
- Employ signs and symbols: When conveying information using icons and symbols, these representations must be straightforward and comprehensible. The swifter the transmission of the message through symbols and signs, the greater its success.
- Segment the infographic: When creating an infographic, divide the content into distinct sections, each serving as a separate unit. The impression of the whole must take precedence over the perception of the individual components while creating an infographic.

Types of infographics

Infographics are categorized into three forms based on presentation: static, animated, and interactive. Each variety possesses distinct traits that differentiate it from the others, and categorization of these sorts is contingent upon the aspects and components included in the infographic. Static infographics comprise text, images, and non-animated visual components. The information presented in this style is confined to what is immediately visible to the observer, and this format is often printed.

Animated infographics encompass the same content as static infographics, offering the capability to present information through continuous motion and animated sequences, rather than in discrete phases or static components, and are seen as more successful than static infographics, as they engage a greater audience due to the distinctive attributes of animation. Interactive infographics encompass the same

information as the preceding two categories, offering a multi-sensory experience that enables viewers to engage with the content by clicking, scrolling, or choosing certain parts, while including audio, video, and photographs to enhance interactivity.

Stages of Infographic Design

The selection of a topic with an intriguing and relatively novel perspective, as well as an engaging narrative, is one of the most fundamental components of an effective infographic. What makes an infographic stand out is its ability to tell a story visually, its innovative design, its clarity and conciseness, its ability to capture the viewer's attention at first glance, and its ability to hold that attention by guiding it to various parts of the infographic. Data, information, ideas, and stories may be easily transformed into an effective infographic by following certain guidelines and using specific tools. According to Stones & Gent (2017), they are:

1. Choosing the topic: Picking a relevant and applicable-to-implementation subject is the first step in making an effective infographic. No matter how skillfully the designer executes the design or how carefully the designer selects the colors, fonts, and images, it won't matter. A popular or relevant topic won't matter if it doesn't grab the audience's attention. Considerations for a suitable topic selection include having a fresh and useful perspective, using comedy (if needed), and selecting a topic that is timely in relation to current events, such as the development of an epidemic.

2. Clarifying the concept: Every infographic starts with a title, which serves as its goal. Then, via preliminary sketching and planning, the concepts are organized and made clear. A general concept of the infographic from the first sketch that doesn't require any design by erasing and scribbling, which helps to reduce mistakes. All the infographic needs are the best route to its goal (Stones & Gent, 2017). While carrying out the task, keep the topic's central idea in mind and present it using visual coding, such as color or dots, in a way that is both simple to grasp and engaging, making sure the reader understands everything and doesn't become confused. This is the main objective here.

3. Craft a captivating narrative to enhance the intrigue of the infographic: After choosing a topic, the next step is to figure out what story the designer wants to tell using that topic. This will guide the design of the infographic, which not only conveys information but also elucidates its significance through the integration of text, graphics, and images, resulting in a captivating visual representation or insightful analysis of the data. Alternatively, the designer could simplify the process of understanding vast amounts of data and information, leading to the development of innovative solutions. If the designer wants an infographic to be a smashing hit and encourage complete reader participation, this approach is a fantastic way to give the material a narrative that is anything but dull.

4. Effective design: Infographic designers should link everything in a way that is easy to understand, enjoyable to look at, and captivating enough to keep the reader interested until the end. The first step is to select relevant photos, and the second is to generate attention visually by selecting related visuals; both approaches serve to accomplish this purpose. It is important to select pictures, lines, symbols, and colors with care so that they relate to the subject at hand and the reader's eyes can easily navigate between them. The designer must create a clear hierarchical structure using these symbols and pictures to guide the eye in the right direction (Pleise, 2023).

Requirements for an effective infographic

1. The most effective infographics are those that accurately and simply convey information visually in a way that is straightforward to understand and enjoy. Visual aids are superior to written descriptions, according to psychologist Dr. Richard E. Mayer. Dr. Richard E. Mayer noted that infographics stand out because they replicate the visual learning process of the human brain. A well-designed infographic will grab people's attention and lay out a strategy for success in a methodical manner (Piktochart & HubSpot, 2015).
2. Appeal to the human mind.
3. Similarities exist between the human brain and infographics, particularly animated ones. The ability to engage the human intellect is a key component of an effective infographic. Making sure the presentation is more than just a

statement is one of the many factors to consider when creating an infographic that people will enjoy. This is because people can process and understand visuals at a rate of up to thirteen milliseconds per second, which is sixty thousand times faster than text processing. In addition, Dr. Mayer discovered that combining text with images improves comprehension compared to using only text. Furthermore, individuals often have limited attention spans, and the brain engages in a battle for attention when presented with visuals that are not only relevant to the texts but also resonate with their personal experiences and ideas. If the designers failed to maintain this consistency, it could lead to negative outcomes or muddled thinking, with the brain missing out on about 90% of the intended information. Therefore, it should display the infographic based on our estimations of what the user would perceive from their previous experiences (Piktochart & HubSpot, 2015). Overly complicated or hard-to-understand infographics will fail to communicate their intended message, as people tend to become naturally distracted.

4. To avoid distracting the reader, it is also crucial to focus on the most significant details and eliminate any superfluous information before delivering the story. Information included in a tale is 22 times more likely to be remembered by readers than if it is mentioned alone, according to Stanford University marketing expert Jennifer Aaker. It is also preferable to create a concise and well-organized infographic framework, breaking up the material into manageable chunks to make it easier to read, and arranging the content in a logical flow with an introduction, a progression of events, and a conclusion. A great infographic effectively manages all its components, from design to text, to convey a clear and specific message; therefore, it's crucial to ensure that it only conveys one core point. In this case, testing the infographic on someone who wasn't involved in its creation can help determine its clarity. Reevaluating the presentation approach is necessary if the recipient appears perplexed or unable to comprehend the message. To guarantee the credibility of the information presented, it is imperative to substantiate the data with dependable sources and precise investigation. This ultimately falls on the journalist, who primarily gathers this material from his diverse networks (Hafver & et al., 2025).

5. Planning for Success
6. Success necessitates meticulous planning when one seeks to accomplish a particular objective. It is imperative that the template and content collaborate to convey an engaging, informative, and practical concept to guarantee success. To guarantee the success of an animated infographic, there are a few things we need to think about before we begin.
7. Identifying data: Since data is the main component and basis of an infographic, it is essential that designers start by concentrating on the data that is already accessible. Take the time to comprehend and thoroughly study this data, ensuring its engagement and originality, examining its methodology, and identifying its sources. The infographic's effectiveness hinges on the precision of the highlighted facts and their potential impact on the intended audience. Once the primary material is selected, the designer can use attention-grabbing visual aids like maps, charts, symbols, and even big statistics to convey information more effectively than lengthy words (Hafver & et al., 2025).
8. Defining a target audience: the step of determining the target audience follows the definition of the primary data. We need to identify the audience that will engage with the material most effectively, based on the information gathered and examined. Housewives, students, or even businesspeople can be the infographic's target audience; each group requires a unique visual style and presentational tone. Knowing our target audience helps us devise an appealing message via text, visuals, or movement. It also helps us choose colors and patterns that appeal to them and capture their interest (Piktochart & HubSpot, 2015).
9. Determine the objectives: At this point, it becomes clear if our aim is to make a difficult decision-making process simpler, draw attention to certain social or economic challenges, or even provide a clear explanation of a scientific or statistical concept. Before the infographic is designed, these goals need to be clearly stated. The goals could be numerous, such as simplifying the processing of large amounts of data, presenting an event chronology, or enabling the designer to compare different components. These goals directly determine the type of infographic to use, whether it's a map, a chronology, or a

complex graph. Knowing the techniques and effects to use in the animated infographic simplifies the animation process (Piktochart & HubSpot, 2015).

10. Verify the key concept: Following the definition of the goals, the infographic's major idea is defined. Like with any design job, we must concentrate on the primary message that we want to get across to the target audience. To do this, we need to respond to three fundamental questions: Who is the intended audience for us? What is the major objective we want to accomplish? And on what data are we going to rely? Once we address these issues, we can express a primary concept that serves as the center of the animated infographic's design in just one line (Hafver et al., 2025).
11. Determining a Story from the Data: One of the most crucial phases in the design process is identifying a narrative in the data. When thoroughly examined and interpreted, raw data, while not always engaging on its own, can often tell a captivating tale. Reorganizing the data and fixing errors will help us achieve our goals. Spreadsheets are among the numerous tools available for filtering, organizing, and analyzing data. By using them to do statistical studies that emphasize the most important points, the designer can arrange the data in either ascending or descending order. The movement and effects in the video serve to emphasize these contrasts (Hafver & et al., 2025).

Animated Infographic

“The integration of computation in graphic design practice is seemingly a recent phenomenon and one that is commonly deemed as cross-disciplinary between design and engineering. Yet upon a closer look, we discover a current of programmatic perspectives in graphic design that transits from modular, rule-based, systematic, and parametric approaches that have been present throughout the history of graphic design” (Shim, 2020).

Previous studies have established distinctive differences in the emotional and cognitive effects of static and animated graphics. However, most support that animated graphics are visually more interesting than static (LEE & JUN, 2020).

Recent advancements in graphic design techniques have made many sophisticated techniques available to artists and designers, elevating the design process to the status of an advanced practice that transcends media boundaries. The stages of design, composition, and modification of all the elements that went into creating the artwork—such as drawings, shapes, colors, and so on—are what give the artwork its life and spirit, and they embody meanings and ideas. Motion design has changed because of the emergence of contemporary advertising media in all its forms. Motion design has become increasingly adept at repeatedly conveying a specific event or shot over time, creating the impression of movement.

Many artists have demonstrated a passion for movement in design to weave creativity around the formal and aesthetic richness of movement; the necessity and modernity of change have called for a more innovative vision, modification, and suitability with those contemporary multiple media with an interactive style with the recipient. Creative activity in art depends on the artist's relationship with his surroundings, and discussing the most significant transition aspects that connect between shots in motion infographics in a variety of creative and aesthetically pleasing ways is crucial, especially when examining the motion design strategies used in motion infographic design. These transitions determine the various ways the designer can convey the intended message to the viewer, as shown in the example provided with the QR code, which is an example of an animated infographic for the Greenhouse Gas Task in Dutch Peatland STOWA EN 2025.

Contemporary technology methods and motion design tools.

Motion infographic designs often include a variety of transitional motions, the most significant of which are:

The straight cut – Hard Cut

While the most common transition, a straight cut is also the simplest. Often used exclusively to transition between views within a scene, this transition seamlessly shifts between shots, demonstrating the story's progression without any intervening inserts (Woltmann, 2023).

Dissolve

A dissolve connects two shots, signaling to the audience that they are part of a continuous sequence and that the narrative remains unchanged between them. It serves as a substitute for a straight cut, which cuts directly to the next scene or shot. A dissolve transition is a slow change from one picture to another in which the second image gradually emerges while the original image starts to fade away. For a while, the two or more photos overlap, combining to form an overlay often referred to as a double exposure or multiple exposures. The duration of the superposition of the two pictures largely determines the dissolve effect. A fade-in dissolve transition from a blank screen to an image, a picture-to-blank screen dissolve transition, or a corresponding dissolve transition that employs parallel pictures or images with the same composition are all available. The first image dissolves into the second image with a similar composition (MasterClass, 2021).

Match Cut

"Match cutting" is a technique that merges two scenes with comparable action and/or matching framing. Motion graphic designers use this in a variety of inventive ways to create symbolism, depict the passage of time, and avoid startling the viewer by controlling viewers' gaze and avoiding the need to create intricate animations; this may save time while animating. This technique can be particularly useful for crafting stunning transitions or utilizing momentum to transform one element into another. Designers use match cuts for a variety of design elements, including movement between two shots, characters, shapes, and colors (Plummer & Richardson, Seamless Storytelling: The Power of Match Cuts in Animation, 2025).

Dynamic / Infinite Zoom

Motion design transitions are essential to developing tales that flow naturally, helping to make the main idea clear and directing the audience from scene to scene as the story progresses; even a less complex design may shine with the correct transitions, leaving the viewer captivated, educated, and inspired—even with the most amazing images and astounding sound effects. A dynamic zoom transition can smoothly shoot an image toward or away from the viewer. Designers control the rate at which an image or scene zooms in or out (Plummer & Richardson, 2025).

Morph

A process that seamlessly transforms one image, shape, or sequence into another, defying the conventional limits of shape and form, is referred to as "morphing." And this type of effect can be implemented to symbolize change, growth, or the passage of time in a visually stunning manner (Videobolt, 2025). For example, consider a sequence in which a larva undergoes metamorphosis into an adult bee, representing a process of transformation. The morphing technique enables a seamless transition, exemplifying the fundamental nature of metamorphosis as a unified and fluid movement (Videobolt, 2025). Different design software can be used to combine the initial and final illustrations or images to perform morphing, generating the frames in between, which a smooth transition necessitates meticulous mapping of related spots on each picture.

Keeping extraneous details to a minimum is essential, but the design should flow well and convey the information better than words alone. The designer of an infographic with a lot of data should avoid using overlapping colors or words and instead go for a style that makes it simple to display the data in an ordered and straightforward fashion (Piktochart & HubSpot, 2015).

Text Effects

Text effects in animated design are display and reveal mechanisms, which are applied to text within animated infographics. Their primary function is crucial for

perception, not merely aesthetics, as they control the reading pace and direct the viewer's attention (viewer pacing and focus) (Williams, 2001). Through techniques such as Typewriter, Wipe, or Easing in-Out, which are subject to the principles of Timing and Emphasis in the rules of motion, these techniques are important to ensure that textual information is conveyed in an interesting, attractive, and organized manner, which enhances the function and effectiveness of the animated infographic.

Position.

The concept of positioning revolves around the fundamental mechanism that determines the basic movement of elements from one point to another along the X, Y, and Z axes in three-dimensional designs. In animated infographics, positioning is primarily employed to guide the viewer's eye and greatly facilitate the flow of information and transitions between scenes to create a clear, logical, and temporal sequence (spatial and temporal sequencing), ensuring the viewer sees the complete message without distraction (Scott, 2011).

Rotation.

Rotation is a vital element in animated infographic design, which combines static visual elements, such as charts, illustrations, and text, with movement, creating a composite form of visual media. The benefit of using movement and rotation lies in their ability to intensely capture the audience's attention and have a greater impact compared to static elements. However, rotation is used in conjunction with other techniques such as panning, tracking, blurring, and scaling as part of the animation design process to enhance the visual narrative. These movements, including rotation, reinforce the sense of the information being presented, promote visual cohesion, and visually, rotation is at the heart of animated infographics (Jun & Lee, 2020).

Scale.

The concept of scale is a fundamental principle of visual design, along with hierarchy, contrast, and balance (Bowen, 2019), where scale plays a pivotal role in organizing and dynamically transforming graphic elements into animated infographic

design. It's an integral part of the animation production process, where visual elements such as graphics and text are positioned, enlarged, or reduced to fit the overall infographic design. This ensures seamless integration into the general structure of the information flow (Tyagi, Zhao, Patel, Khurana, & Mueller, 2022).

The functional aspect of scale revolves around employing size primarily to represent data and convey the concept of proportion and variation in the information presented. When representing graphs, scale is used to utilize different sizes and relative differences and communicate them to the viewer. It is also used to create a visual hierarchy, as manipulating font size serves to indicate the main heading in relation to the subtext. Furthermore, the size of graphic elements can be changed to create a clear focal point in the design, drawing the viewer towards the most important information (Su, Liu, & Yu, 2018).

Opacity.

Opacity is a powerful element in animated infographics; it's used to manage the flow of visual information and guide the viewer's attention and used directly to create a gradual fading in/out of elements and text.

Opacity helps highlight the most important information, while the gradual fading of less important elements allows the important ones to appear clearly and smoothly, thus reducing cognitive load and focusing attention on the core message at the right moment (Kuba & Allan, 2022).

Null.

When designing animated infographics in design software such as After Effects, the null object is a fundamental and useful tool for controlling movement. It's an invisible layer that doesn't appear in the final project output, and its function is purely functional. Like other layers, it possesses transformation properties such as position, scaling, rotation, and transparency, and keyframes can be added to it.

The primary role of nulls is to facilitate hierarchical organization and movement within two-dimensional and three-dimensional spaces. The most prominent use of

nulls is parenting, and they are an integral part of complex animation processes and robotic animation, serving as a central tool for 3D camera movement.

Cameras.

In animated infographic design, the camera is used as a narrative and methodological tool to enhance depth of field by isolating the main data (focusing) from backgrounds or secondary elements. This draws the viewer's attention to the most important points, and camera movements such as dolly and orbit are employed to reinforce narrative flow; for example, slow zoom movements lend weight to the targeted data within the narrative.

Analysis of survey data

Methodology and procedures.

This section provides an overview of the study's methodology, community, and sample, as well as the data collection instrument and validation and reliability indicators. The study also employs statistical techniques and research protocols to reach its conclusions.

Study sample: The study sample consisted of (200) individuals, and Table (1) shows the distribution of sample individuals according to personal and functional variables.

Table (1): Frequencies and percentages of study sample individuals according to study variables.

Percentage	Repetitions	Category	variable
48%	96	Male	Sex
52%	104	Female	
100%	**200**	**Total**	
20%	40	Less Than20	Age group
44%	88	From30 –20	
28%	56	From40 -31	

6%	12	From50 -41	
2%	4	More Than50	
100%	**200**	**Total**	
32%	64	Less than 3 years	Years of experience
34%	68	From5-3	
20%	40	From10-6	
14%	28	More than10	
100%	**200**	**Total**	

Table (1) shows the following:

- Frequencies and percentages of the study sample members for the gender variable, where it was found that the "female" category came with the highest frequency (104) and a percentage of (52%), while the "male" category came with the lowest frequency (96) and a percentage of (48%).

- Frequencies and percentages of the study sample members for the age group variable, where it was found that the "20-30" category came with the highest frequency (88) and a percentage of (44%), while the "over 50" category came with the lowest frequency (4) and a percentage of (2%).

- Frequencies and percentages of the study sample members for the years of experience variable, where it was found that the "3-5" category came with the highest frequency (68) and a percentage of (34%), while the "more than 10" category came with the lowest frequency (28) and a percentage of (14%).

Study Tool:

The questionnaire in its final form consisted of (31) paragraphs, distributed over three areas:

- The effectiveness of using motion design techniques and tools to animate infographic elements to convey information and messages in an interesting, correct, innovative and easy-to-understand way, which has (9) paragraphs.

- The area of highlighting the most important animated design techniques used and how to employ them to create an animated infographic, which has (14) paragraphs.

- The area of the extent of the attractiveness and interaction of users with the animated infographic compared to the static infographic, which has (8) paragraphs.

The Likert criterion for the five-point scale was used to measure the opinions of the study sample members, and a very high degree (5) was given a high degree (4), a medium degree (3), a small degree (2), and a very small degree (1) were given by placing a check mark (√) in front of the answer that reflects their degree of agreement. The following classification was also relied upon to judge the arithmetic averages as follows: (Highest value - lowest value) / 5, which equals (5-1) / 3 = 1.33 category length.

- 1.33- 2.33 Low.

- 2.34 to 3.66 Medium.

- 3.67 - 5 High.

The demographic variables consisted of three variables as follows:

- Gender, which has two categories: male, female

- Age group, which has five categories: less than 20, from 20 to 30, from 31 to 40, from 41 to 50, and more than 50

- Years of experience, which has four categories: less than 3 years, from 3 to 5, from 6 to 10, and more than 10.

Instrument validity: apparent validity (judges).

Stability of the study tool

Table (2) shows Cronbach's alpha results to reveal the internal consistency coefficients of the study areas

Cronbach's alpha	Number of paragraphs	Scale
0.79	9	How effective is infographic?
0.87	14	The most important techniques
0.93	8	How attractive and interactive
0.91	31	Design techniques as a whole

It is clear from Table (2) that the internal consistency coefficient (Cronbach's alpha) for the study areas ranged between (0.79 - 0.93), and the internal consistency coefficient for the scale as a whole, "design techniques", reached (0.91), and all of these are high and acceptable consistency coefficients for applying the study tool.

Statistical Processing.

To answer the study questions, appropriate statistical methods and treatments were used, which were carried out using the Statistical Package for the Social Sciences (SPSS Version 25), as follows:

- Extracting frequencies and percentages for the distribution of study sample individuals according to the study variables.

- Extracting arithmetic means and standard deviations for the study scales as a whole and the paragraphs of each scale separately.

- Applying the three-way analysis of variance (3-Way ANOVA) to detect differences in the total score according to the variables: gender, age group, and years of experience.

- Applying the Scheffe test for post-hoc comparisons.

Presentation of Results

This section includes a presentation of the results reached by the study that aimed to investigate the role of motion design in enhancing the effectiveness of infographics.

Presentation of the results of the first question: How effective is the use of motion design techniques and tools in moving infographic elements to convey information and messages in an interesting, correct, innovative and easy-to-understand way?

To answer this question, the averages and standard deviations were extracted for the effectiveness of using motion design techniques and tools in moving infographic elements to convey information and messages in an interesting, correct, innovative and easy-to-understand way, as shown in the following table.

Table (3) Arithmetic means and standard deviations of the effectiveness of using motion design techniques and tools to animate infographic elements to convey information and messages in an interesting, correct, innovative and easy-to-understand way.

Level	Standard deviation	Arithmetic average	Paragraph	#
High	0.83	4.49	Motion design techniques help to convey information in an interesting and effective way.	1
High	0.69	4.50	Motion design helps make the messages and information presented easier to understand.	2
High	0.65	4.44	Motion design provides an innovative way to communicate information.	3
High	0.73	4.40	The animated design helps to present information in a logical and easy order.	4
High	0.73	4.39	The animated design motivates me to watch the infographic until the end.	5
High	0.58	4.53	Motion design helps to highlight the important and essential points in the infographic.	6
High	0.81	4.44	Animated design helps me remember information better than static design.	7
High	0.78	4.32	I find that motion design helps to clarify the relationship between the different elements in the infographic.	8

High	0.74	4.31	Animated design helps draw attention to important points and conclusions in an infographic compared to static design.	9
High	**0.38**	**4.42**	**Overall effectiveness of use**	

Table (3) shows the arithmetic averages and standard deviations of the paragraphs on the effectiveness of using motion design techniques and tools in moving infographic elements to convey information and messages in an interesting, correct, innovative and easy-to-understand way. Paragraph No. (6), which stated, “Moving design helps highlight important and basic points in infographics,” had the highest arithmetic average (4.53) and a standard deviation of (0.59), and the score was high. Paragraph No. (9), which stated:

“Moving design helps draw attention to important points and conclusions in infographics compared to static design” had the lowest arithmetic average (4.31) and a standard deviation of (0.74), and the score was high. The effectiveness of use came with an arithmetic average (4.42) and a standard deviation of (0.38), and the score was high.

Therefore, the effectiveness of using motion design techniques and tools in moving infographic elements to convey information and messages in an interesting, correct, innovative and easy-to-understand way is high.

Displaying the results of the second question: What are the most important motion design techniques used, and how to employ them to create an animated infographic? To answer this question, the averages and standard deviations of the most important motion design techniques used and how to employ them to create an animated infographic were extracted, as shown in the following table.

Table (4) Arithmetic means and standard deviations of the most important motion design techniques used and how to employ them to create an animated infographic.

Level	Standard deviation	Arithmetic average	Paragraph	#
High	0.69	4.33	I find that using the morphing technique - which is the technique	1

			of gradually and smoothly transforming one image or shape into another - in animated infographics makes the transitions between elements striking and attractive	
High	0.74	4.30	I find that the straight cut (hard cut) technique – which uses direct and quick cutting from one scene to another without any transition effects – is not smooth and hinders movement and perception in the animated infographic	2
High	0.83	4.24	Text effects make the text information in infographics more attractive and easier to read	3
High	0.97	4.26	I find that the morphing technique - which is the technique of gradually and smoothly transforming one image or shape into another - contributes to highlighting the differences and similarities between elements effectively	4
High	0.86	4.28	The straight cut (hard cut) technique – which uses direct and quick cutting from one scene to another without any transition effects – has the effect of keeping my attention while watching the infographic until the end	5
High	0.76	4.38	Text effects help highlight important information in an infographic	6

High	0.74	4.40	I find that morphing - the technique of gradually and smoothly transforming one image or shape into another - adds visual value to infographics	7
Medium	1.29	2.96	I find that Text Effects make it easier to follow and understand texts quickly	8
Medium	1.29	2.93	Dissolve – a technique that creates a smooth transition where the first shape fades into the second – is useful for drawing attention to important elements	9
Medium	1.33	2.94	I find that the Dissolve technique adds a creative touch to the animated infographic	10
Medium	1.29	2.87	Match cut, a technique that allows transitions between two different elements by linking them together, enhances interaction with animated infographics.	11
Medium	1.29	2.88	I find match cut helpful in keeping the infographics engaging.	12
Medium	1.28	2.87	Dynamic Zoom - a technique in which the image or shapes are dynamically enlarged and reduced during viewing - helps enhance viewing of animated infographics.	13
Medium	1.43	3.29	Dynamic Zoom technology in animated infographics helps in quickly understanding and comprehending information.	14
Medium	**0.67**	**3.64**	**Top technologies as a whole**	

Table (4) shows the arithmetic averages and standard deviations of the paragraphs of the most important motion design techniques used and how to employ them to create an animated infographic. Paragraph No. (7), which stated, "I find that the morphing technique - which is a technique for gradually and smoothly converting one image or shape into another - adds visual value to the infographic," had the highest arithmetic average (4.38) and a standard deviation of (0.76), and the score was high. Paragraph No. (12), which stated, "I find that (match cut) is useful in maintaining the continuity of viewing the animated infographic," had the lowest arithmetic average (2.87) and a standard deviation of (1.28), and the score was high. The most prominent techniques came with an arithmetic average (3.64) and a standard deviation (1.28), and the score was average.

Therefore, the "morphing" and "text effects" techniques are the most effective in creating attractive and easy-to-follow animated infographics, while other techniques such as "match cut" and "dynamic zoom" are of medium importance and have less impact on the continuity of viewing the animated infographic, and the "hard cut" technique is considered unsmooth and hinders movement and perception.

Displaying the results of the third question: How attractive and interactive are users with animated infographics compared to static infographics? To answer this question, averages and standard deviations were extracted to measure the attractiveness and interaction of users with animated infographics compared to static infographics, as shown in the following table.

Table (5) Arithmetic average and standard deviations to measure the attractiveness and interaction of users with animated infographics compared to static infographics.

Level	Standard deviation	Arithmetic average	Paragraph	#
High	0.81	4.34	I find animated infographics more engaging than static infographics.	1
High	0.76	4.36	I feel more engagement with animated infographics than static infographics.	2

High	0.84	4.26	Animated infographics are best used when learning new and complex information.	3
High	0.78	4.33	I think that animated infographics can improve my educational or cultural experience.	4
High	0.82	4.31	I feel that the animated design makes the information more interactive and helps keep my attention longer.	5
High	1.04	3.80	Animated infographics encourage me to share information with others.	6
High	0.72	4.58	Animated infographics help simplify complex information and make it more understandable.	7
High	0.88	4.39	I find that animated infographics increase my interest in the topic compared to static infographics.	8
High	**0.56**	**4.30**	**The overall attractiveness and engagement of users**	

Table (5) shows Arithmetic averages and standard deviations of paragraphs measuring the extent of users' attractiveness and interaction with animated infographics compared to static infographics, where paragraph No. (7) which stated: "Animated infographics help simplify complex information and make it more understandable" came with the highest arithmetic average (4.58) and a standard deviation of (0.72) and the score was high, while paragraph No. (6) which stated: "Animated infographics encourage me to share information with others" came with the lowest arithmetic average (3.80) and a standard deviation of (1.04) and the score was high, and the extent of attractiveness and interaction as a whole came with an arithmetic average (4.30) and a standard deviation (0.56) and the score was high. Therefore, animated infographics are more attractive, and the viewer interacts with them more compared to static infographics.

Displaying the results of the fourth question: Are there statistically significant differences in the role of motion design in enhancing the effectiveness of infographics attributed to the study variables? To answer this question, use the three-way ANOVA test to detect differences in the role of motion design in enhancing the effectiveness of infographics attributed to the study variables according to the variables (gender, age group, years of experience).

Table (6) Results of applying the three-way ANOVA test to detect differences in the role of motion design in enhancing the effectiveness of infographics attributed to the study variables (gender, age group, years of experience).

Statistical significance	Values F	Average squares	degrees of freedom	sum of squares	Variables
.477	.508	.136	1	.136	Sex
.000	**17.185	4.603	4	18.411	Age group
.727	.436	.117	3	.351	Years of Experience
		.268	191	51.156	Error
			199	70.027	Corrected total

**Statistically significant at the significance level (α≤0.01)

Table (6) shows that there are statistically significant differences at the significance level (α≤0.05) in the role of motion design in enhancing the effectiveness of infographics attributed to the age group variable, as the value of (F) reached (17.185) with a statistical significance of (0.000). To detect the locations of statistical significance, the Scheffe test was applied for post-comparisons; Table (7) shows this. There were no statistically significant differences at the significance level (α≤0.05) attributed to the rest of the study variables, as the values of (F) did not reach the significance level (α≤0.05).

Table (7) Scheffe's test for post hoc comparisons of age group variable

More than50	from-41 50	from-31 40	From 30 – 20	Less than20	Arithmetic Average	Age Group
0.72**	0.26	0.48	0.54	-	4.46	Less than 20
0.18	0.28	0.06	-	-	3.92	From 30 – 20
0.24	0.22	-	-	-	3.98	From 40-31
0.46	-	-	-	-	4.20	From 50-41
-	-	-	-	-	3.74	More than 50

Table (7) shows that the differences in the field of the impact of using mobile design technologies according to the age group variable were between the category (less than 20 - greater than 50), and the differences were in favor of the categories “less than 20” with an arithmetic mean of (4.46) and a high degree, while the arithmetic mean of the category (more than 50 years) was (3.74).

Conclusion

“Animated and interactive infographics have the power to engage learners on a deeper level, making complex concepts more accessible and memorable” (Nkosinkulu, 2024).

Animated infographics contain the same content as static infographics but differ in presenting information through continuous dynamic movement and animated sequences so that each part of the infographic is linked to the next without interruption of information and in a logical and sequential manner, rather than in separate steps or fixed elements with intermittent information. Animated infographics are more successful than static ones because they attract a larger audience thanks to the distinctive properties of movement. People can process and understand images at a speed of up to 13 milliseconds, which is 60,000 times faster than reading text. To

ensure the reliability of information, accurate and reliable sources must be relied upon, as the impact of infographics depends on the accuracy of the information it provides and the extent of its impact on the target audience. Motion design has become increasingly sophisticated in its ability to repeat events in a way that creates a dynamic sense of continuous and flowing movement. Many designers have shown a clear interest in incorporating movement into their design work, which has added creative dimensions that combine visual aesthetics and functional form. This integration has made designs more compatible with audience aspirations and interaction, especially in the context of modern multimedia that requires renewed and attractive visual and narrative responses.

Motion design techniques play a pivotal role in improving the effectiveness of communicating information and messages, as they contribute to presenting content in an interesting, correct, innovative and easy-to-understand way. Techniques such as “morphing” and “text effects” appear as important and effective tools that have a significant impact on attracting viewers’ attention, as these techniques work to transform information into an interactive visual experience that makes it easier for the audience to absorb the content and continue following it without difficulty.

On the contrary, the “hard cut” technique shows some flaws in motion design, as it suffers from a lack of smoothness, which may affect the movement of visual elements and the smoothness of transition between scenes, which may hinder viewers’ visual perception and negatively affect the sequence of the motion infographic. Thus, it becomes clear that choosing the right techniques for motion design plays a crucial role in creating an effective motion infographic that achieves the desired interaction, enhances the viewer’s experience, and contributes to conveying messages in an innovative and attractive way.

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