

The Technological Impacts of Graphic Design: Visual Adaptations of English Borrowed Terminology in Arabic: A Case Study of Arabic Typography

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Abstract

This study explores how English terms used in Arabic visually adapt due to technological influences on graphic design. It examines the impact of Western visual design technology on Arabic visual terminology and aims to reveal the extent of these influences. The research highlights how technology reshapes language, focusing on both visual culture and linguistic adaptations. It investigates new English terms related to the Arabic language and analyzes the evolution of Arabic typography across various technological stages. The findings are based on discussions about language interaction, such as how exported technological language interacts with the host language. The study also reveals cultural shifts influenced by technology and highlights typographical changes. Overall, this research provides insights into how terms are adapted across different languages, with the goal of better understanding these dynamic linguistic and visual transformations.

Keywords: Graphic Design, Arabic Typography, Technology, Visual Culture.

1. Introduction

In recent years, graphic design has evolved significantly in the Middle East, and this is primarily due to advancements in Western technology (Kress & Van, 2020). People often mix text and visuals in graphic design to communicate their thoughts and feelings. The visuals here include websites, logos, and advertisements. Due to the importance of graphic design, marketers throughout the Middle East have developed strong and robust campaigns. Moreover, recognizing the visual cultural context in question has enabled this goal to be achieved whilst also improving economies and achieving outstanding results.

The graphic design community in the Middle East is thriving. The region has a unique style that combines traditional elements with modern features using visual elements. Several different methods are used by graphic designers in this area to effectively convey traditional Islamic art through contemporary digital media. Their beliefs, values and cultures can be expressed through the items that they create. Moreover, they have showcased a wide selection of visuals that are present in contemporary typography and lively illustrations.

What's more, these illustrations were ideally suited to the visual setting and values in the Middle East (Gruber &Haugbolle, 2013).

Western-style graphics poured into the region when European print technology was introduced in the early twentieth century, and this had both advantages and disadvantages. In terms of advantages, it has allowed Middle Eastern designers to learn and apply new techniques in their work. On the other hand, this change has resulted in a shift towards Western trends at the expense of traditional ones. The adoption of this technology has thus caused a shift away from traditional cultural designs. Furthermore, the Western designs have adopted graphic styles and patterns associated with Middle Eastern visual culture (Helfand, 2001).

Countries in the Middle East are now witnessing different trends in modern graphics outcomes. Foreign visual concepts have had significant effects on Middle Eastern design. However, this has caused traditional art forms (including symbols, illustrations and typography) to be pushed aside.

In line with this, Middle Eastern graphic designers are facing a unique challenge when it comes to developing new styles that are different from those used in Western cultures. Any advancements in technology and graphic design are directly linked to Western technology, and this can be a disadvantage to these designers. Furthermore, given the exclusive religious, cultural and economic situations of countries in this respect, they face several challenges. These challenges are numerous and include insufficient professional development opportunities, limited access to updated versions of Western technology and software, insufficient resources and poor awareness of local visual culture (Reyns & Lazreg, 2017).

To overcome these challenges and create effective designs that fulfil the needs of clients in the Middle East, local graphic designers must be creative problem solvers who have a strong ability to think outside the box. It is also essential that they produce fresh, cutting-edge designs that set them apart from their Western counterparts. Graphic designers also need to ensure that this inflow does not completely replace and overtake regional cultural art forms.

Western technology has been significantly influenced by different visual cultures and countries. Nowadays, many countries are gradually losing their traditional visual identities, and this is primarily due to the advent of Western digital design tools (Kress & Van, 2020). Moreover, the methodologies employed in the Middle East are not always considered in the Western technology industry, and this has led to the adoption of new design trends and styles. This is evident in the Middle East, where Western technology is increasingly influencing graphic design.

To reduce the Middle East's reliance on Western visual design, the issue of language employed in the fields of graphic design and traditional technology must be discussed. Thus, this research aims to examine the extent to which technology impacts the craft itself, and the identity of the culture derived from this craft. These issues will be addressed in this work by examining the graphic design vocabulary that this technology has brought to the Middle East. Subsequently, the effects that Western technology has on Middle Eastern visual culture will be discussed.

1.1. Literature Review: English Terminologies Adopted in Arabic

The Evolution of English Borrowings of Art and visual communication in Arabic

Borrowed terminology plays a critical role in the evolution of the host language, particularly in the fields of science, medicine and technology (Awang & Salman, 2017). This is also vital for social advancement. Not only does this expand the host language's lexicon, but it also improves cultural dynamism and relevance. In turn, this renders the borrowed language more accessible to individuals from different communities and ultimately enhances cross-cultural communication. This linguistic exchange is exemplified through the widespread adoption of English words in the Arabic language, highlighting a fusion of cultures and languages that has largely impacted modern-day Arabic. English words such as "computer" have been integrated into Arabic, which has allowed speakers to retain their cultural heritage whilst also promoting communication with English-speaking parties (Shalaby, 2020).

In Arabic, there has been a longstanding tradition of adopting words and terminologies from other languages, including French, Turkish, Persian and English. English words started to be frequently adopted in Arabic during the mid-20th century, which coincided with globalization and Western influence, particularly in the fields of science, commerce and technology (Ayish, 2015). For example, terms such as "إنترنت" (internet) and "كمبيوتر" (computer) are commonly used in daily conversations in the Arabic language. In a similar fashion, business terms such as "تسويق" (marketing) and "استراتيجية" (strategy) have been integrated into the Arabic language because of global commerce. This lexical exchange has also been influenced by the entertainment industry, which has contributed words such as "موسيقى" (music) and "فيلم" (film).

Lexical borrowing (i.e., the exchanging of vocabulary between Arabic and English) is an intricate concept that is influenced by social practices, culture and history. This has significantly enriched both languages, promoting cross-cultural communication and highlighting the interconnectedness of global societies. Both the English and Arabic languages have long histories of cultural exchange which can be traced back to medieval times through science, trade and intellectual pursuits (Ben-Zaken, 2010). During the Golden Age of Islam, Arabic researchers made significant contributions that had a long-lasting impact on European learning throughout the Renaissance, paving the way for the linguistic borrowings that followed.

According to Zughoul (2003), There has been a significant increase in the number of English words entering the Arabic language due to the rapid globalization and industrialization of the 20th century. Given the hegemony of the English language in the fields of commerce, media and technology, Arabic-speaking areas have joined in with the global adoption of English terminology to express new ideas. Nowadays, global commerce relies heavily on English, which serves as a common language for international transactions. Thus, many English words relating to marketing, finance, management, and trade have been adopted into Arabic. The act of borrowing words enhances communication and promotes cooperation between regions that speak Arabic and those that speak English.

English-language media (including music, internet and film) have led to the introduction of many English words into the Arabic language. This has enriched Arabic with contemporary cultural references, allowing citizens of Arabic countries to access and enjoy global entertainment

trends (Darwish, 2017). The world has become increasingly connected in recent years, and thus the lexical borrowing between Arabic and English facilitates international communication and understanding. Having shared vocabulary enables interactions to be made in the fields of tourism, diplomacy, business and academia, which fosters mutual understanding and cross-cultural exchange.

To make English more accessible to Arabic speakers, any English words that are translated into Arabic undergo phonological and orthographic modifications so that they conform to Arabic phonetics and script (Ayish, 2015). The increasing use of English terminology in the Arabic language has prompted discussions among language purists, who are concerned about the impacts that it may have on the authenticity and cultural identity of Arabic. Nonetheless, lexical borrowing is a key component of linguistic evolution, which highlights the dynamism of language in response to globalization. The language employed in visual arts that has been translated from English into Arabic reflects the significant changes that have resulted from technological development and globalization (Mellor, 2011). This development not only adds English words to the Arabic language but also renders visual arts (including acting, plastic arts, filmmaking and graphic design) a key subject of educational systems in Arabic countries.

Globalization has been critical in promoting the exchange of practices and ideas in the field of art. In turn, this has led to English visual art terminology being incorporated into Arabic discourse with the breakdown of communication barriers, artistic communities have increasingly accepted and embraced concepts from Western artistic tradition (Hammond, 2007). This can be seen in the adoption of English terms such as "modernism", "abstract art" and "impressionism" into Arabic art circles. In turn, this reflects artistic vocabulary that is shared internationally. Moreover, technological advancements in the fields of filmmaking and digital media have transformed visual art education in Arabic countries (Fishman & Means, 2016) The integration of English words associated with animation, digital design and cinematography into Arabic highlights the transformative effects that technology has had on modern-day art.

Digital software and tools with English names have now become key elements in education, enabling students to explore new learning approaches and methodologies. The use of English words thus highlights the significance of technological and digital literacy in contemporary art education. Globalization and technological progress have caused a cultural interchange that enhances artistic expression, promotes intercultural communication, and gives artists and students opportunities to engage in cross-border participation and collaboration (Smiers, 2003). English terminologies have been modified for use in Arabic visual arts education, and this highlights the dynamism of artistic practices, as well as their effectiveness in responding to changing technological landscapes and increased global connectivity. The vocabulary adopted in the field of visual arts demonstrates the long-lasting impact of globalization on Arab contemporary artistic expression.

Although the translation of English visual art terms into the Arabic language has undoubtedly helped to promote international communication and technological advancements, this could ultimately cause the decline of historical or traditional visual culture in Arabic communities. Arabic artistic vocabulary and historical visual practices are often neglected in favor of the

extensive integration of English, and this poses the risk of losing unique cultural identities and artistic heritage. This decision to employ English words may ultimately cause a disconnect from the historical narratives and traditional artistic roots that have long influenced and shaped Arabian visual culture. Additionally, English terminologies have dominated visual arts discourse for a long time.

Their influence on artistic preferences and practices may ultimately alter the trajectory of artistic development in Arabian communities. This focus on globally recognized terms and approaches could adversely impact the exploration and embracing of local artistic traditions.

Graphic Design as a Borrowed Terminology

The Arabic word for "graphic design" (translated from English) highlights the intricate relationship that exists between technological advancement, globalisation and cultural identity in Arabic countries. According to the Cambridge (2008) and Oxford (1989) dictionaries, graphic design can be defined as the art of combining text and images in advertisements, books and magazines. Although the term has been widely employed throughout the Arabic world, there are also significant concerns regarding the preservation of traditional visual arts heritage. According to Aylon (2016), Print technology is critical in graphic design, and thus the concept is widely recognised in the Arabic world.

Nonetheless, this has often impeded the application of the rich traditions associated with Arabic visual arts that deserve further recognition and investigation. Although Western visual arts have undeniably inspired graphic design approaches in many Arabic countries, Western design principles (i.e., Latin typography) are often prioritized in print and poster media (Silsilah, 2014).

Visual art is a key component of visual culture identity, and the neglect of traditional Islamic visual art applications has ultimately led to an identity crisis in the field of Arabic graphic design (Gebrael, 2017). Moreover, calligraphers in Arabic countries usually need to have the design skills required to produce logos and designs that are representative of Arabic aesthetics, which have been largely ignored in university education since university degrees in graphic design tend to prioritize Western approaches over indigenous ones.

It is interesting to note that it is more common to use the term "graphic design" in Arabic communities than its Arabic translation "altasmeem al-bayani". This demonstrates that English terminology is dominant in this field. Moreover, it indicates a wider cultural shift towards embracing global design trends at the expense of the unique Arabic visual arts heritage.

For instance, Amal Abu Al Haq (2012) conducted a study titled 'Identity of Islamic Art in Graphic Design for Logos of Jordanian Universities', which examined the logos of Jordanian universities to determine their relationship with Islamic art. Although this study is written in Arabic (including the title), the English pronounce of graphic has been written in Arabic. Arabic graphic design is experiencing an identity crisis, and this is indicative of a wider disconnect between contemporary design approaches and traditional artistic values. In recent years, the use of traditional approaches and materials has declined substantially. Combined with a historical push towards Westernization in the early 20th century, this has led to cultural continuity being diminished in the field of visual arts education.

To conclude, graphic design in Arabic communities has been largely aided by global design trends and technology breakthroughs. Each component of graphic design element (including drawings, typeface, and layout) has been impacted to some extent by technology (Boujemaa & Alhazmi, 2020). Moreover, these features can be seen in Middle Eastern visual culture. Nonetheless, reconciling contemporary approaches with the rich history of Islamic-Arabic art and design is critical. The cultural identity of Arabic graphic design could recover if this gap is closed and this would also help to promote a more accurate a more complex representation of visual innovation in the international design debate.

2. Methodology

Technology has influenced all key elements of graphic design. Moreover, the technology has been developed and employed on an industrial level, with new terminologies and approaches being developed at each level. The present study thus focuses on examining the effects of Western technology on terminologies in the field of graphic design throughout the Middle East.

This technology is causing a shift aware from traditional Islamic/Arabic approaches to print design. This study focuses specifically on typography as the key component of graphic design. The key objective of this work is to examine how the adoption of Western visual cultural terms and how this has influenced graphic design approaches throughout the region, particularly regarding visual design.

2.1 Method

A time frame for when the study was carried out will be created at each technological level. We will also specify the technology that was used at each stage. Moreover, the effect of technology on typography that is used in each case study will be explored.

Arabic typography is a unique art form, as well as an important technological advancement. In turn, this has been largely influenced by technological, cultural and artistic factors. In this study, the analysis will take place in four stages. Each stage will include a brief historical overview of Arabic writing and Arabic typography b, and it will explore the influence of western technology on Arabic writing.

2.2 Case Study

In each technological stage, the case study is collected based on specific criteria:

- A high-resolution picture should be used as a case study.
- It must have been produced during the same technological stage.
- It must have Arabic typography or writing that includes digital fonts.

The case study must be in good condition to facilitate a comprehensive examination of the technological effects on typography.

As a result, the following choices were made:

- First Stage: A manuscript sheet from a folio was preferred to symbolize traditional handwriting methods of that era which focus on early Arabic typography as an example of skill and creativity.
- Second Stage: 2 pages printed in Europe at its inception were chosen as examples of transition between manuscript and print technology with emphasis on European printing techniques applied to Arabic typography and introduction of movable type.
- Third Stage: Two printed pages produced in Arab nations were chosen to reveal how print technology has been embraced and redefined by Middle East. They offer an insight into how local printing presses emerging resulted in the development of Arabic typography.
- Fourth Stage: Three pictures representing Arabic typefaces developed through digital technology were taken up to demonstrate the impact of digital technologies on typographic design.

The Technology Impacts of Arabic Typography.

We can examine the impacts that Western terminologies have on graphic design approaches in the Arabic context by exploring the terminologies used in Arabic typography.

First: Early Manuscripts and Calligraphic Traditions (7th - 14th Century):

Historical background

Arabic writing has its origins in early inscriptions on stone and manuscripts. It is also deeply rooted in traditional Arabic calligraphy. Arabic script thrived during the Islamic Golden Age and served as a prominent means of recording and documenting information. There are many different types of Arabic calligraphy (such as Kufic and Naskh) that have paved the way for the formal aesthetic of Arabic calligraphy. The careful craftsmanship of scribes and the artistic expressions that they made through letterforms have been exemplified through Manuscript production.

Several different methodologies have been applied to examine Arabic writing structures in Islamic manuscripts and researchers often perform geometric analysis to understand the structure of Arabic script. For instance, geometric analysis was performed by George (2003; 2007), during which recurring grid structures were identified in 1079 early Quranic manuscript folios. These grids often contained proportioned rectangles that delineated script areas, and this structure included Arabic writings, page layouts, and margin alignments. What's more, the findings of George's study revealed that modular grid units were employed on the illuminated manuscript.

Furthermore, Jarar (2012) also performed a geometric analysis on Moroccan manuscripts, and the findings revealed that there is a significant relationship between page layout structures and Arabic script organization. It was also found that circular arrangements are used to structure Arabic writing anatomies in these manuscripts. Which lead to new understandings and information about Arabic writing and the new process of writing.



(A)

(B)

Figure (1): (A) Quran folio from the manuscript. (B) A geometric analysis of the same folio, showing the square grid and its application in Arabic writing. (Jahameh,2018, Vol 2, (A) P 102, (B) P 112)

Analysis: Figure (1, A) presents the Naskh type, which is used to write most Quranic manuscripts. In Figure (1, B), the Naskh writing in the Quranic folio was structured in the square grid. The analysis was performed by Safaa Jahameh (2018), who conducted geometric analyses on 151 folios from Islamic manuscripts across different dynasties, identifying consistent use of both squares.

Meanwhile, research carried out by Jahameh hypothesized that these grids functioned as guiding tools for manuscript writers, which helped them to organize graphic elements in Islamic manuscripts. Additionally, the findings of Jahameh's study indicate that there has been a significant shift away from understanding traditional Arabic calligraphy, which focused heavily on the freehand skills of calligraphers. On the other hand, Jahameh's study also revealed that Arabic calligraphy was methodically structured using a grid system that was developed on geometric principles.

Specific criteria for manuscript selection were also employed in this study, which introduced a new approach to analysis that can be used in all forms of Arabic calligraphy. The grid has been described as a smart device employed to create Middle Eastern manuscripts to produce and a new type of Arabic structured writing beside the graphic elements ().

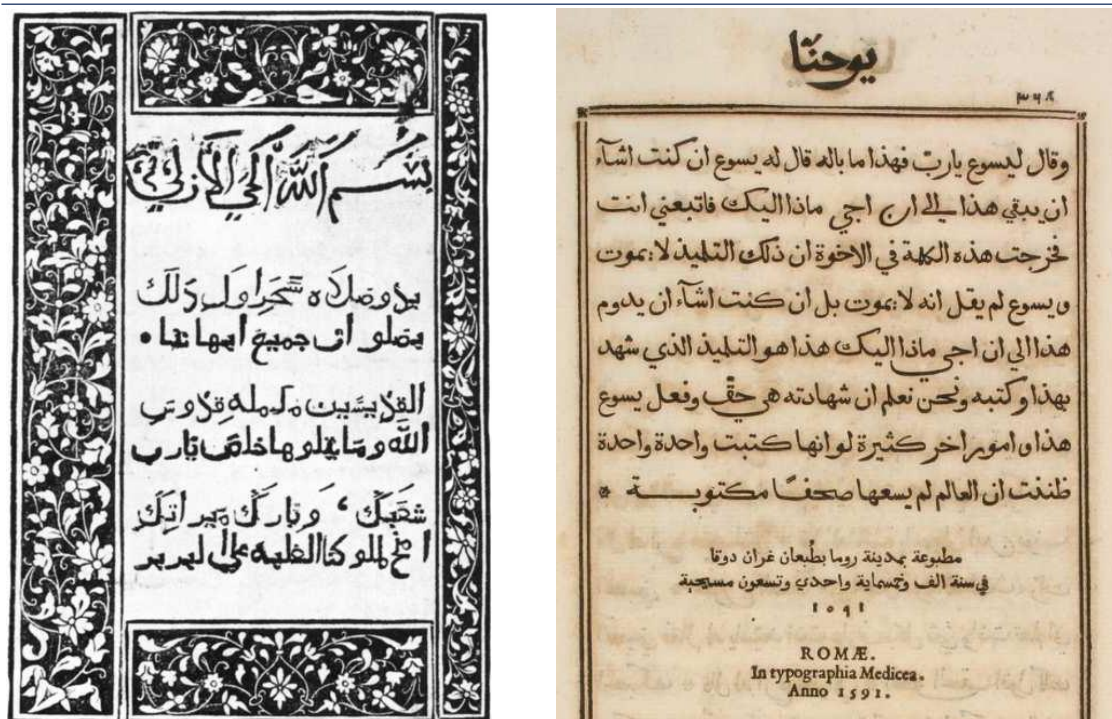
Second: Early Arabic print in Europe: Printing and Print Press and the Spread of Arabic Printing (15th - 17th Century)

Background history: According to Bahia Shehab and Haytham Nawa (2020), the early printing did exist in Egypt during the 10th Century, it was largely neglected in Islamic societies, where the Arabic language relied heavily on hand-written scripts. This continued until the Ottoman period. It is probable that this resistance was caused by fears of textual distortion, especially about religious such as the Quran. (Bulliet, 1987). As Latin typography progressed, Arabic calligraphers continued to use traditional approaches with pens and bamboo calligraphy sticks.

As mentioned by Hisham Ali (2018), In 1486, the first significant Arabic text was created in Mainz, Germany by Erhard Reusch. It was subsequently printed by Peter Schöffer, the apprentice of Johann Gutenberg (Hisham, 2018). This text took the form of early Arabic letters that had been woodcut and seemed to have a simplistic Gothic influence. In turn, this highlighted the printing aesthetics of Gutenberg's era. Between the 15th and 17th centuries, Arabic script started to appear in printed materials following Gutenberg's death, and this was inspired by the growing Western interest in printing Arabic manuscripts to be distributed among Arab Christians in the Middle East region.

The Kitab Ulswaai (The Book of Hours) was printed in Fano (Italy) in 1514 and was the first complete book in Europe to be written with Arabic letters. In fact, it was intended to reach Arabic-speaking Christians in Europe. Moreover, following the death of William Caxton in 1491 in England, the first Arabic-print book was created by Wynkyn De Worde, which became widely recognized for its spaced letters, Figure (2).

Arabic print started to become more prominent in Europe in the early 17th Century, generating competition between printing hubs such as Rome, Paris, Lyon and London. Nonetheless, despite many advancements being made (Raven, 2014), the quality of Arabic typesets continued to be subpar due to the craftsmen's lack of familiarity with the language, which rendered texts less readable. At first, Arab communities ignored the advantages of letterpress printing, displaying an initial contentment with traditional calligraphy and manuscript copying approaches.



(A)

(B)

Figure (2): Examples of Early Arabic Print in Europe, in (A) kitab salat al sawai made in Rome 1517, in (B) Bible written in Arabic produced by Granjon in 1591 (Tracy,1975).

Analysis: Printing has significantly influenced Arabic design, and thus Arabic calligraphy was recognised in the eyes of the West for the first time at this point. Furthermore, different perspectives have been introduced to Arabic typing (such as Arabic writing as connected letters). Additionally, Arabic was formed as separate letters in the first Western print technology, with each letter forming one block. The elements and structure of Arabic calligraphy, as well as the name 'Arabic type' were subsequently recognised and employed in early Western print. Meanwhile, the Islamic manuscript, the smart device and the grid facilitated different shapes and styles for the same Arabic calligraphy. Nonetheless, despite the influence that print had on the Arabic world, the grid was not used as a design tool to create Arabic typography in early Arabic western printing. Jahameh's study identified two grid types used in Arabic writing, namely the hexagon grid and the square grid. It was also found that Arabic writing structured using the square grid shared many similarities with Latin typography.

Third: Arabic print in the Arab world (17th -19th)

Background History: According to Bahia Shehab and Haytham Nawa (2020), Typography started to take hold in the Arab world during the 17th century, and many milestones were achieved. The Bishop of Damascus (Sarkis al-Rizzi) commissioned the Book of Psalms to be printed at the Monastery of Saint Anthony of Quzhayya in Lebanon in 1610. This edition employed Syriac and Arabic in a two-column format, highlighting the increasing interest in Arabic typography. Many years later, in 1706, Bishop 'Abd Allah ibn al-Fadl al-Antaki commissioned the printing of the

Book of Psalms and the Gospels in Aleppo, Syria. This ultimately demonstrates the expansion of Arabic printing and translation in the region.

Shehab and Nawa (2020), indicated that Arabic typography gained further traction in the 18th century, with the first Arabic press being created in 1720 in Constantinople during Sultan Ahmed III's reign. This was aided by Ibrahim Muteferrika, a Hungarian who had converted to Islam. This was a critical moment, facilitating the production of printed texts in Arabic. Subsequently, the establishment of the Al-Shuwayr Printing Press Lebanon in 1733 was supported by Jesuits, and thus ultimately became a hub for Arabic typography. Interestingly, typeset letters engraved at Al-Shuwayr Printing Press were employed by former goldsmith and scholar Abd Allah ibn Zakhariya Zakhir, highlighting indigenous Arab typography.

Additionally, In the years that followed, the printing press grew substantially throughout the Arabic world. In the 19th century, Muhammad Ali created works that ultimately facilitated the development of the first Muslim press in Bulaq, Egypt. In turn, this became an international centre for Arabic publications. Throughout Khedive Isma'il's reign, modernizations continued to be made at the Bulaq Press. As the turn of the 20th century arrived, Egypt had become a hub for Arabic printing, publishing more than 10,000 books between 1822 and 1900. This ultimately led to the flourishing of the Arab press, which played a critical role in shaping cultural exchanges intellectual discourse and cultural exchange throughout the region, see figure (3).



(A)

(B)

Figure (3): (A) an image of the first newspaper in Egypt (Al Ahram Newspaper) in (1876) (P. 78, Arab Graphic Design, 2020). (B) presents an image of the early print of Bulak in 1828. (Monier, 2022, Ahram newspaper, Link).

Analysis: Arabic typography had already been introduced to Middle Eastern visual culture at this point, and this was due to the development of Western print technology. The understanding of the theory and practice surrounding Arabic typography was a focal point of Western print and this ultimately became the most prominent feature of Middle Eastern graphic design. Furthermore, Arabic calligraphy was perceived to be a type of visual culture in the Middle East and an artistic subject that has divided Islamic manuscripts. Nonetheless, the technology and devices used in the previous manuscript were no longer used in Arabic typography. In turn, few font types were used during this time.

Fourth: Digital Revolution and Contemporary Arabic Typography (Late 20th Century - Present):

Background history: The 19th century was a critical time for the development of Arabic script since many attempts were made to modernize Arabic typography and align it with modern design concepts. (Osborn, 2017). Print foundries in countries such as Lebanon (i.e., Bou Antoun and Saleh) were created, producing metals designed especially for use in Arabic countries. Subsequently, the introduction of linotype machines and typewriters enabled Arabic fonts to be standardised (Nemeth, 2017). However, this unfortunately led to the loss of some calligraphic grace. The Arabic typographic rules were refined and systematised by influential people such as Mohammed Mohiedin Anis, who paved the way for subsequent improvements.

The digital era caused a renaissance in Arabic typography, with computer software and digital font technologies being used on a scale never seen before (Khalil, 2019). This increased creativity and promoted calligraphic heritage. Designers such as Mamoun Sakkal and Nadine Chahine spearheaded these innovative approaches, combining traditional features with modern design aesthetics. The complex nature of Arabic script was considered when developing OpenType technology, which facilitated the development of sophisticated typography across many different digital platforms. (Abdel-Rahman, 2019).

A significant transformation was made to Arabic design in the 1990s due to changes in the field of digital typography. In response to this challenge, Letraset provided digital fonts in PostScript format, and this significantly contributed to the subsequent success of desktop publishing (Yaqin, 2018). Letraset made substantial efforts to uncover new and innovative elements in Arabic typeface design, which increased the array of Arabic fonts available. Pioneers (including American-born Maamoun Sakkal who founded the Sakkal Design Studio) pushed Arabic typography into graphic design and calligraphy, which had a major influence on large international corporations such as National Geographic and Microsoft (Zureik, 2020). Advancements in Arabic digital typography have been promoted through the development of innovative studios such as Deco Type, which was established in 1985. This is due to their collaboration with Unicode to standardize Arabic script across digital platforms. This ultimately paved the way for European designers such as Thomas Milo to find solutions to Arabic scripts that emanate from Islamic calligraphy traditions (Shehab & Nawar, 2020).

Furthermore, Shehab and Nawar added (2020) that diaspora Arab designers including Sudanese Taj al-Sir Hassan and Hassan Musa experimented with different styles and elements in Arabic design and calligraphy, which further highlights the contribution that the diaspora made to the global development of Arabic typography. They had very multidimensional careers, involving teaching, calligraphy and graphic design. In turn, this highlighted the sheer variety of factors that influence contemporary Arabic typography.

Times New Roman	من اللازم النظر في أمر سلامة الكتابة العربية
Traditional Arabic	من اللازم النظر في أمر سلامة الكتابة العربية
Simplified Arabic	من اللازم النظر في أمر سلامة الكتابة العربية
Arabic Typesetting	من اللازم النظر في أمر سلامة الكتابة العربية
Arial	من اللازم النظر في أمر سلامة الكتابة العربية

Figure (4): How computer-aided Arabic fonts use the fundamental features of Latin fonts. (Ali, 2018).

A : نقدم في هذا البحث قاعدة بيانات الكلمات العربية
B : نقدم في هذا البحث قاعدة بيانات لكلمات عربية
C : نقدم في هذا البحث قاعدة بيانات لكلمات عربية
D : نقدم في هذا البحث قاعدة بيانات لكلمات عربية
E : نقدم في هذا البحث قاعدة بيانات لكلمات عربية
F : نقدم في هذا البحث قاعدة بيانات لكلمات عربية
G : نقدم في هذا البحث قاعدة بيانات لكلمات عربية
H : نقدم في هذا البحث قاعدة بيانات لكلمات عربية
I : نقدم في هذا البحث قاعدة بيانات لكلمات عربية
J : نقدم في هذا البحث قاعدة بيانات لكلمات عربية

Figure (5): Digital Arabic typography font style and type, (Ali, 2018).

Analysis: Typography has been digitised and programmed so that it can be used on digital platforms. In line with this, Unicode (a standardized system for encoding and representing text characters) was developed. Furthermore, the Western organization Unicode used Latin typography anatomy bases to create new fonts. Since then, Arabic typography has continued to evolve alongside Latin typography and now, the structure of Arabic digital fonts is largely based on the early stages of printing, with each Arabic letter being identified in block lettering. Nonetheless, every Arabic block now has a distinct digital code. Thus, Western tools and techniques should be used to create Arabic typography.

Several elements were subsequently incorporated into traditional Arabic writing (Arabic manuscript to Arabic style). For instance, the font family with Arabic type font, the bold and light font, and the italic font did not exist in Arabic/Islamic manuscripts. Nonetheless, Arab type designers faced both challenges and opportunities due to globalization and digital communication (Mahmoud, 2017). In this regard, exciting opportunities that could boost the future of Arabic typography include new varieties of font, responsive web typographies and multi-script design. Furthermore, revived interest in traditional calligraphy highlights the enduring allure of handcrafted letterforms.



Figure (6): CNN Arabic Logo, (Blankenship, 2003).

Analysis: The development of printing technology, coupled with ongoing technological advancements, has profoundly impacted traditional Arabic calligraphy. The integration of technology into Arabic calligraphy has transcended mere preservation of its essence, aesthetics, and dimensions. It has also aimed to harmonize the Arabic script with the Latin script to meet the demands of contemporary society. Figure 6 illustrates this synthesis through the CNN logo in Arabic, exemplifying the successful integration of Arabic calligraphy and Latin text while maintaining clarity. This is demonstrated in the word " بالعربية " in the digital Arabic script, where the letters Ba, Ya, and T are connected. The Latin letters C, N, and N are incorporated to ensure proper readability and legibility.

3. Discussion

Technology and Arabic Graphic Design: Shaping the Post-Modernist Era of Arabic Graphic Design

Technological advances have been significant in influencing the postmodernism of Arabic graphic design, from its beginning in the 15th century right up to the development of the printing press. (Dakkak, 2022). Arabic typography serves as a compelling case study that bears witness to this development. Initially, the Arabic script was meticulously crafted by skilled calligraphers, and every stroke was full of aesthetic beauty. Nonetheless, the development of the printing press revolutionized the Arabic typography process (Ghazaleh, 2015). In turn, this enabled printed materials to be disseminated on a mass scale. Fonts also became standardized at this point.

As technology has progressed, design tools have been increasingly digitized in the field of new Arabic typography, and this inspired experimentation and innovation. Designers were now

able to use a variety of digital software and fonts, making typographic expression more flexible. The new digital landscape has given designers unprecedented freedom to creatively examine different typographic compositions using tools and approaches from Western design. Cross-cultural interactions have been promoted through the globalization of design practices, and this has enabled Arabic graphic designers to employ Western design trends and techniques (Al-Farraj, 2016). This highlights the significant influence that Western technology has on advancements in the print industry.

Nowadays, the intricacies of the contemporary Arab world can be represented through visually dynamic and culturally resonant typographic compositions. We can thus use Arabic typography to trace the impacts that technology has had on the evolution of Arabic graphic design, from its humble beginnings to its current position as a leading form of contemporary design innovation.

Technology and the New elements of Arabic Graphic Design

Technology has led to a revolution in the field of Arabic graphic design, transforming visual culture in the field. Arabic digital typefaces and typography were prominent in this change, and this level of importance was not seen in prior eras of print. These elements lack a foundation in the visual traditions and were not acknowledged. These elements needed to be examined as they significantly impact Arabic design. It was also essential to develop and implement new guidelines for teaching and examining these elements, and to explore all avenues for their reidentification as a subset of Arabic writing present in Islamic manuscripts.

The Neglected Approach in the Arabic Visual Culture: Reasons and Solutions

The neglected approach of employing the grid in Arabic visual culture highlights the intricate craftsmanship of book production throughout the Arabic and Islamic world. These artisanal workshops involved clandestine processes, that caused tools and techniques to be lost. However, they can potentially be revitalized in the field of digital technology. It is critical to examine historical graphic design techniques to preserve this cultural heritage. Additionally, creating a digital platform that is like that of traditional Islamic manuscript design tools could overcome this problem. We can thus dissect the intricate processes of yore to revitalize neglected techniques and incorporate them into modern design practices. This combination of technology and tradition preserves the rich legacy of Arabic visual culture, as well as propelling it into the digital age.

Challenges Facing Post-Arabic Graphic Design

It is important to note that Arabic graphic design faced several challenges. One significant challenge is establishing a balance between tradition and modernity. Even though Arabic design has a rich history and can serve as inspiration, it is important to promote innovation and adaptation to modern environments without sacrificing cultural authenticity. The study of Islamic-Arabic manuscripts is a key example here. Moreover, globalisation has generated the issue of standardisation, and it is possible that Arabic design will become less unique. The digital gap is another significant challenge to discuss here, as some populations may be unable to participate in discussions about graphic design if they do not have the technology or skills required to do so.

Moreover, censorship and sociopolitical factors can impede artistic expression. Fostering diversity, investing in technology and education, encouraging cross-cultural dialogue, and promoting creative freedom are all critical in overcoming these obstacles. If these challenges are addressed, post-Arabic graphic design can thrive, and its distinct cultural identity can be preserved.

The requirements to preserve traditional elements of Arabic-Islamic design.

There is a need to create extensive digital archives to maintain Arabic-Islamic traditions. They should feature calligraphy, geometric patterns, and architectural details, enabling designers and scholars, as well as the public having an opportunity of accessing them. In addition, it was essential to establish conferences and specialized training based on traditional approaches. This can be done by merging such components into contemporary design education through alliances with cultural organizations and academic institutions so that future generations will appreciate their heritage. By doing this, traditional craftsmen together with modern designers can help open new avenues for exhibiting their craftsmanship while at the same time coming up with novel ideas.

Governmental bodies and cultural institutions must provide funding and support for preservation of historical designs. This can be seen through grants or exhibitions that promote the use of traditional materials in contemporary settings among others. These technologies are easier to incorporate into current design because they have strengths like replication of exact classic features by using contemporary technologies such as digital fabrication or 3D printing. Such awareness campaigns are intended at gaining respect and passion by making society know more concerning its patterns of culture from which it has come from earlier times. It is also possible to foster global understanding through programs of international cultural exchanges featuring visual culture design experience exchange across borders.

4. Conclusion

This research has examined the significant impacts Western technology has had on graphic design in Arabic countries, particularly in the field of typography. The adoption and integration of English words with Arabic typography has enriched Arabic visual culture, fostering a dynamic blend between technology and language. From the early days of print to today, technological advancements have transformed Arabic graphic design. The transition from handcrafted calligraphy to mass-produced texts facilitated by the printing press marked a significant shift in the field. Furthermore, digital design tools have enabled the combination of traditional calligraphic styles with contemporary digital fonts (Hassan & Salameh, 2021). New technologies have become critical in developing typography and digital fonts that inspire Arabic visual culture. However, these elements must be re-examined to establish new educational frameworks that reflect their importance as elements of Arabic writing.

The preservation and innovation of Arabic visual heritage depend on the revival of historical approaches such as the grid system. To address the challenges posed by tradition versus modernity and the digital divide, it is essential to promote education, inclusivity, and cultural exchange. This will ensure that Arabic graphic design continues to thrive. The influence of Western technology on Arabic graphic design is multifaceted, impacting both the preservation of traditional techniques and the exploration of new creative possibilities. By examining historical

findings within the context of broader themes, this research highlights the dynamic interplay between tradition and modernity in Arabic typography. This understanding underscores the importance of balancing cultural heritage with contemporary innovation to ensure the continued evolution and enrichment of Arabic graphic design.

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Ethics Declarations

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki (1964) and was approved by the Research and Ethics Committees of Applied Science Private University and Al-Ahliyya Amman University, Jordan. The following ethical standards were strictly observed:

- Voluntary Participation: Informed consent was obtained from all relevant authorities and participants prior to their involvement.
- Minimization of Risk: All necessary precautions were taken to minimize any potential risks to participants.
- Confidentiality: Participant identities and responses were kept strictly confidential.
- Transparency: Participants were clearly informed about the study's objectives and procedures.
- Documentation: All stages of the research process were thoroughly documented.
- Reliability: The study's methodology and instruments were designed to ensure consistency and dependability.
- Validity: Data collection and analysis procedures were structured to maintain the integrity and accuracy of the findings.

Data Availability Statement

The datasets generated and analyzed during this study are available from the corresponding author upon reasonable request.

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Conflicts of Interest

The authors declare no conflict of interest.

Author Contributions

- **Safaa Jahameh and Faten ALjazzar:** Conceptualized and designed the study, collected and analyzed the data, and drafted the initial manuscript.
- **All authors:** Reviewed and edited the manuscript and approved the final version for publication.

Consent for Publication

The authors consent to the submission of this paper for publication and, pending the editorial board's decision following the peer-review process, agree to its publication. This work has not been previously published nor submitted to any other journal for consideration.

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