Idealogy Journal Vol. 11 No. 2, 2026, pp 548-559
DOI: https://doi.org/10.24191/idealogy.v11i2.1002
Section: Original Article

Analysis of Stylistic and Dynamic Typography in Augmented Reality for Food Mobile Applications

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Received: 10 July 2026; Accepted: 20 July 2026; Published: 1 September 2026

ABSTRACT

Augmented reality (AR) is increasingly used in food mobile applications to present dishes and products as interactive three-dimensional content, yet the typography that carries names, descriptions and ingredient information in these interfaces has received little research attention. This study analyses how stylistic typography (typeface, colour, text arrangement and layout) and dynamic typography (transition and movement) are applied in AR food mobile applications. A qualitative content analysis was conducted on six purposively selected applications available on iOS and Android. Screenshots and screen recordings of each AR view were coded against a deductive coding matrix derived from the literature, and coding consistency was checked through independent coding by two researchers followed by consensus discussion. The analysis showed that stylistic typography followed a consistent pattern: sans-serif typefaces were identified in five of the six applications, light-coloured text was the dominant colour strategy, and in all six applications text was positioned around rather than over the AR food object, keeping the object as the visual focal point. Dynamic typography was comparatively rare, appearing in only two applications, as a selection-triggered pop-up in one and as sequenced upward, sliding and fade-in text in the other. The findings suggest that current AR food applications rely mainly on static stylistic choices to organise information, while the communicative potential of dynamic typography remains underused. The study offers designers a traceable reference for typographic decisions in AR food interfaces.

Keywords: *Stylistic Typography, Dynamic Typography, Augmented Reality, Food Mobile Application, Content Analysis*

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1 INTRODUCTION

Augmented reality (AR) overlays computer-generated content onto a live view of the physical environment, and mobile devices have made this experience widely accessible. In the food sector, AR is used in menus, packaging and marketing to present dishes and products as three-dimensional content that users can view within their own surroundings (Xie et al., 2022; Rani & Ramlie, 2023). Evidence from marketing research indicates that viewing food in AR can influence how desirable it appears (Fritz et al., 2023), and consumers expect AR food experiences to be informative rather than merely novel (Huang, 2025). In Malaysia, AR has been taken up in education and design practice, including food-related learning applications (Waidi et al., 2021; Syafiq Yusof et al., 2022).

Much of the information in these experiences, however, is still delivered through text: the name of a dish, its description, its ingredients and its price. Typography is therefore the channel through which the informative value of AR is either delivered or lost. Two dimensions of typography are relevant here.

Stylistic typography concerns how text looks and is organised, namely its typeface, colour, arrangement and position on screen. Dynamic typography concerns text that changes over time through transition and movement, a form described in early interaction research as kinetic typography (Ford et al., 1997). In AR, both dimensions operate under conditions that conventional screen design does not face, since text must remain readable against a live and changing camera background while sharing space with a three-dimensional object (Cauz et al., 2024).

1.1 Problem Statement

Research on AR food applications has concentrated on consumer response, three-dimensional visualisation and technical implementation (Xie et al., 2022; Fritz et al., 2023), while the typographic design of these interfaces has rarely been examined. Reviews of text readability in AR have synthesised factors that affect reading across AR devices but do not address commercial mobile food applications specifically (Cauz et al., 2024), and guidance on typographic properties for digital interfaces has been developed mainly for conventional two-dimensional screens (Dick & Woloszyn, 2023). Dynamic typography, in turn, has been studied mostly in motion graphics, video and generative design (Bai et al., 2024; Liu et al., 2025; Mohd Zainuddin et al., 2025), which leaves open the question of whether and how it is used in interactive AR interfaces. As a result, designers have little evidence on how typography is currently handled in AR food applications, or on which stylistic and dynamic choices recur across them.

1.2 Research Objectives

This study aims to analyse the use of stylistic and dynamic typography in AR food mobile applications. Specifically, it seeks to (i) identify the stylistic typography patterns, namely typeface, colour, text arrangement and layout, used in the AR views of the selected applications; and (ii) examine whether and how dynamic typography, in the form of transition and movement, is applied, and what communicative role it plays within the AR interface.

2 LITERATURE REVIEW

2.1 AR in Food Applications: From Visualisation to Information

Studies of AR in the food domain have mostly asked what AR does for the product. Xie et al. (2022) trace its uses across the agri-food chain, Rani and Ramlie (2023) examine AR applications as an extension of packaging design, and Fritz et al. (2023) show that presenting food through AR can shape how desirable it is perceived to be. Educational applications follow a similar logic: the AR food pyramid developed by Waidi et al. (2021) relies on visualised food categories to support children's understanding of balanced nutrition. Across these studies, the three-dimensional object is the centre of attention. Yet consumers interviewed by Huang (2025) identified informativeness as a key expectation of AR marketing in the retail food industry, and much of that information is carried by text. The literature has therefore examined the AR food object in some depth while leaving the typographic layer that explains the object largely unexamined.

Design studies published in Idealogy Journal point in a similar direction for other AR contexts. An analysis of digital illustration in AR showed how visual content enriches AR experiences and supports immersive narratives (Syed Rizakri et al., 2024), and a content analysis of AR murals in Kuala Lumpur identified interface aesthetics, colour and clear text overlays among the components of engaging AR design (Zulkifly et al., 2025). In both studies, however, typography appeared as one component among many rather than as the focus of analysis.

2.2 Stylistic Typography and Readability in AR

Guidance on stylistic typography comes mainly from screen-based interfaces. Dick and Woloszyn (2023) relate five typographic properties, namely accessibility, legibility, readability, personality and customisation, to user needs in digital interfaces. These properties are realised through concrete design choices: typeface affects legibility and the character of an interface; colour determines contrast and the separation of information types; text arrangement orders content into titles and supporting text; and layout positions text relative to other interface elements.

AR complicates each of these choices. Sawyer et al. (2020) demonstrated that the legibility of text read at a glance is sensitive to typeface and to the complexity of the background behind it, a condition that AR produces continuously because the background is a live camera feed. Cauz et al. (2024) likewise identify text size, colour and contrast, and the placement of text relative to the scene among the recurring factors in AR readability. The implication is that stylistic conventions taken from conventional screens cannot simply be assumed to hold in AR. How designers colour and position text around a three-dimensional food object needs to be examined in its own context, which is the first concern of this study.

2.3 Dynamic Typography in Interactive Media

Dynamic, or kinetic, typography refers to text that moves or changes over time and was recognised early as a means of adding emphasis, tone and expression to written language (Ford et al., 1997). Recent work has broadened the field considerably. Bai et al. (2024) review artistic text generation, including the extension of static text effects into animated forms, and Liu et al. (2025) present a method that animates letterforms according to their meaning while attempting to preserve legibility. A tension runs through this work: motion adds expressive and attention-directing value, but it can compete with the reader's ability to decode the text.

In applied design research, Mohd Zainuddin et al. (2025) found that motion effects in documentary typography supported viewers' understanding and recall of complex content. Their material, however, was linear video in which timing is controlled by the producer. AR interfaces differ because the user controls pace, viewpoint and interaction. Work on AR-based interactive typography (Li, 2024) and on interaction design patterns in mobile AR (Nikolarakis & Koutsabasis, 2024) treats user interaction as a trigger for change in the interface. This raises the question of whether dynamic typography in AR food applications serves as feedback to user actions, as a storytelling device, or is absent altogether, which is the second concern of this study.

2.4 Synthesis and Analytical Framework

Taken together, the literature supports three observations. First, AR food research has focused on the object rather than on the text that explains it. Second, stylistic typography guidance has been developed largely for conventional screens, and its application in AR remains uncertain. Third, dynamic typography has been examined mainly in video and generative contexts rather than in interactive AR interfaces. No study identified in this review examines stylistic and dynamic typography together in AR food mobile applications. Following content analysis studies in Idealogy Journal that examined multimedia elements in mobile applications (Ahmad et al., 2025) and typography in motion media (Mohd Zainuddin et al., 2025) through coding matrices, this study adopts five analytical categories: typeface, colour, text arrangement and layout as components of stylistic typography, and kinetic typography, comprising transition and movement, as the component of dynamic typography (Figure 1).

3 METHODOLOGY

3.1 Research Design

A qualitative content analysis design was adopted. Content analysis is a systematic and replicable technique for making inferences from texts and other meaningful material, including visual and multimedia content (Krippendorff, 2013), and it allows patterns, features and meanings to be identified across a defined set of materials (Bengtsson, 2016). A deductive approach was used, in which categories were defined from the literature before coding (Section 2.4). The unit of analysis was the AR view of each application, that is, the screen state in which the AR food object and its associated typography are displayed together.

3.2 Sample Selection

Applications were selected purposively from the Apple App Store and Google Play Store using three criteria: (a) the application provides an AR view of a food or beverage product; (b) typography is displayed on screen during the AR view; and (c) the application was publicly available for download at the time of data collection. The presence of dynamic typography was not a selection criterion; it was coded when present, so that its frequency could be observed rather than assumed. Only six applications were accessible for analysis.

The final sample of six applications, labelled AR1 to AR6, is presented in Table 1. These labels are used consistently in the analysis so that each finding can be traced to a specific application.

Table 1 Study sample of AR food mobile applications

Label	Application	Developer	Platform	AR content analysed
AR1	Menu AR Augmented Reality Food	KLIK, OOO	iOS	Food item with name and menu information
AR2	Kabaq Augmented Reality Food	The Glimpse Group	iOS	Menu list with selected dish information
AR3	DASH	Halal Development Corporation Berhad	iOS	Food product with description and ingredients
AR4	SamosFood	Omega Technology	iOS, Android	Food model with ingredient and recipe panels
AR5	Wine Enthusiast AR	Augmented Island Studios	iOS	Wine bottle with surrounding text
AR6	FoodMenu Augmented Reality	Xiteb (Pvt) Ltd	Android	Pizza menu with product description

3.3 Data Collection

Each application was installed and operated on iPhone 13 Pro Max between March until July, 2026. For every application, screenshots of the AR view were captured at the point where the food object and its text were displayed together. Because transition and movement cannot be observed from a single still image, the AR view was also screen-recorded, and recordings were reviewed frame by frame whenever text appeared, moved or changed. All screenshots and recordings were stored with the application label and capture date to form an audit trail.

3.4 Coding Framework and Procedure

Coding followed the matrix in Table 2, which defines each category and the observable evidence required to code it. Transition refers to how text enters or leaves the screen, such as a pop-up or fade-

in, whereas movement refers to text that changes position while visible, such as upward or sliding motion. Text arrangement and layout were distinguished explicitly during codebook development because the two were initially easy to confuse: text arrangement describes the internal order of text blocks, for example a title above a description, whereas layout describes where the text sits relative to the AR object and the edges of the screen.

Table 2 Coding matrix for the typographic analysis

Component	Category	Operational definition (what was coded)	Key sources
Stylistic	Typeface	Typeface classification (serif, sans-serif, decorative), weight and relative size used for different levels of text	Dick & Woloszyn (2023); Sawyer et al. (2020)
Stylistic	Colour	Text colour, colour differences between levels of text, and contrast against the camera background or panel	Sawyer et al. (2020); Cauz et al. (2024)
Stylistic	Text arrangement	Internal order and grouping of text blocks, such as title–description hierarchy and sectioning	Dick & Woloszyn (2023); Mohd Zainuddin et al. (2025)
Stylistic	Layout	Position of text relative to the AR object and screen edges; use of panels or containers	Cauz et al. (2024); Zulkifly et al. (2025)
Dynamic	Kinetic typography: transition	How text appears or disappears (e.g., pop-up, fade-in) and what triggers the change	Ford et al. (1997); Bai et al. (2024)
Dynamic	Kinetic typography: movement	Change in the position of visible text (e.g., upward, sliding), including direction and sequence	Ford et al. (1997); Liu et al. (2025)

(Source: Authors, adapted from the cited literature)

For each application, a descriptive entry was written for every category (Table 3). The entries were then compared across applications to identify recurring patterns and exceptions, which were consolidated into a feature matrix (Table 4). Word clouds generated from the coded descriptions were used only as a visual summary of recurring terms (Figure 2) and not as a basis for inference. Figure 1 summarises the analytical framework.

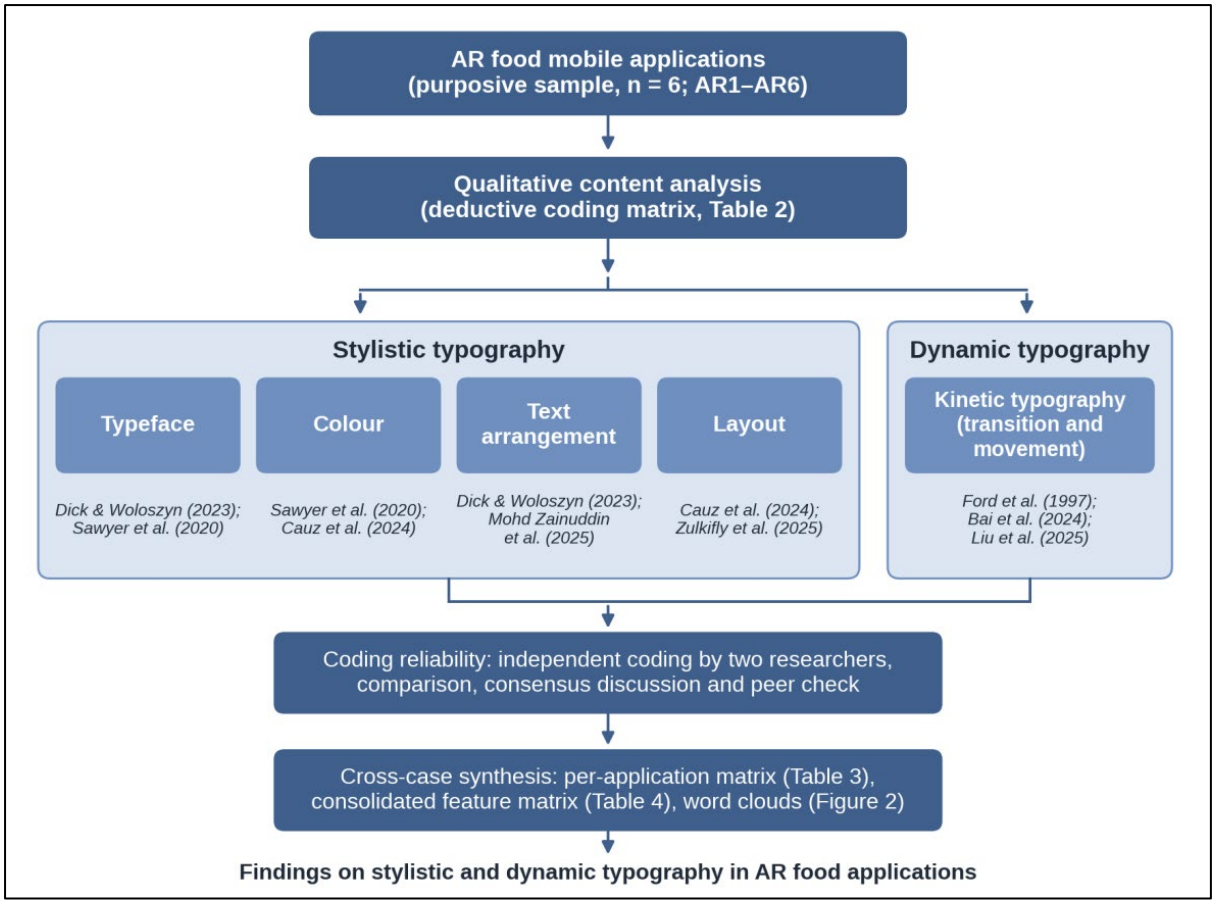


Figure 1 Analytical framework of the study

4 RESULTS

4.1 Typographic Features of Each Application

Table 3 reports the coded findings for each application. Four applications (AR1, AR3, AR4 and AR6) presented typography only as static information. AR2 used a transition triggered by user selection, and AR5 combined several forms of movement.

Table 3 Coded typographic features of each AR food mobile application

App	Typeface	Colour	Text arrangement	Layout	Kinetic typography
AR1	Modern sans-serif; bold weight for the food name creates a clear hierarchy	White for all text; contrasts with the food image and background	Bold food name(“Hawaii”) followed by supporting menu information in a single block	Text placed at the bottom of the screen without covering the food image	None observed; text remains static
AR2	Sans-serif; bold weight for menu titles	White only; contrasts with the background	Menu title above; description below in a smaller size	Menu options on the left; selected item information in a box at the lower right	Pop-up transition when a menu item is selected
AR3	Simple, modern sans-serif suited to the mobile screen	White for the food name; black for description and ingredients	Food name at top centre; description and ingredients below in separate sections	Food product centred; information panel at bottom centre; name at the top	None observed
AR4	Simple typeface SamosFood; relatively small size, still readable	Green for headings (“Ingredients”, “Recipe”); black for body text	Chat-bubble panel with heading at the top and details below	Food model centred; information panels above and below it	None observed
AR5	Bold sans-serif at a large size for emphasis	Light blue on a dark background	Main title at the top of the bottle; supporting text beside it	Bottle centred as the focal point; text distributed around it	“WINE & TECH” moves upward; “IN THE VINEYARD” slides from right to left; “Drones” fades in
AR6	Large, clean sans-serif	White on orange and dark backgrounds	Food name at the top, description below; pizza options listed separately	Selected item information on the left; menu choices on the right	None observed

(Source: Authors)

4.2 Cross-Case Patterns

Table 4 consolidates the coded features across the six applications, showing for each feature which applications exhibit it. The patterns for each component are described below with reference to the specific applications concerned.

Table 4 Consolidated cross-case matrix of coded typographic features

Coded feature	AR1	AR2	AR3	AR4	AR5	AR6	n/6
Typeface							
Sans-serif typeface	✓	✓	✓		✓	✓	5
Bold weight marks key information	✓	✓			✓		3
Large type size for emphasis					✓	✓	2
Colour							
Single light text colour throughout	✓	✓			✓	✓	4
Colour distinguishes levels of information			✓	✓			2
Text arrangement							
Title or name precedes supporting text		✓	✓	✓	✓	✓	5
Content divided into separate sections or lists		✓	✓	✓		✓	4
Layout							
Text positioned around, not over, the AR object	✓	✓	✓	✓	✓	✓	6
AR object centred as the focal point			✓	✓	✓		3
Text contained in a panel or box		✓	✓	✓			3
Kinetic typography							
Transition (pop-up) triggered by user selection		✓					1
Movement (upward, sliding) and fade- in sequence					✓		1
Static typography only	✓		✓	✓		✓	4

(Source: Authors)

Note: ✓ = feature observed; blank = not observed.

Typeface. Sans-serif typefaces were identified in five applications (AR1, AR2, AR3, AR5 and AR6), while AR4 used a simple typeface. Hierarchy was created through weight more often than through size. In AR1, a modern sans-serif with bold styling for the food name places the name clearly above the supporting information, and the same use of bold weight for key text appears in the menu titles of AR2 and the title of AR5. Large type was used for emphasis in AR5 and AR6. AR4 was the exception in size, presenting relatively small text within its panels.

Colour. Two colour strategies emerged. The first, used in AR1, AR2, AR5 and AR6, applied a single light colour to all text, white in AR1, AR2 and AR6 and light blue in AR5, and relied on contrast with a darker image or interface background. The second, used in AR3 and AR4, assigned different colours to different levels of information: a white food name with black description and ingredient text in AR3, and green headings with black body text in AR4. The second strategy encodes hierarchy in colour itself, whereas the first depends on weight and position to do so.

Text arrangement. Text was ordered from a name or title to supporting detail. In AR2, AR3 and AR6 the name appears above a smaller description, and in AR4 a heading introduces the ingredient or recipe details within the panel. AR2, AR3, AR4 and AR6 further separated content into distinct sections or lists; AR6, for instance, keeps product information apart from the list of pizza options. AR5 departed from the vertical text block by placing its title on the bottle and its supporting text beside it, tying the text directly to the object.

Layout. The most consistent finding concerns layout. In all six applications, typography was positioned around the AR object rather than over it: at the bottom of the screen in AR1, in a lower-right box in AR2, in top and bottom panels in AR3, above and below the food model in AR4, around the bottle in AR5, and in left and right columns in AR6. In AR3, AR4 and AR5 the object was centred with

text arranged around it, making the food or product the visual focal point. Text was contained in panels or boxes in AR2, AR3 and AR4, whereas AR1, AR5 and AR6 placed text directly on the image or interface background.

Kinetic typography. Dynamic typography was present in only two of the six applications. In AR2, text appeared through a pop-up transition when the user selected a menu item, so that motion acted as feedback to the user's action. In AR5, motion was sequenced independently of selection: "WINE & TECH" moved upward, "IN THE VINEYARD" slid from right to left and "Drones" faded in, building the message in stages. AR1, AR3, AR4 and AR6 used static typography only. Figure 2 summarises the terms that recur in the coded descriptions for each component.

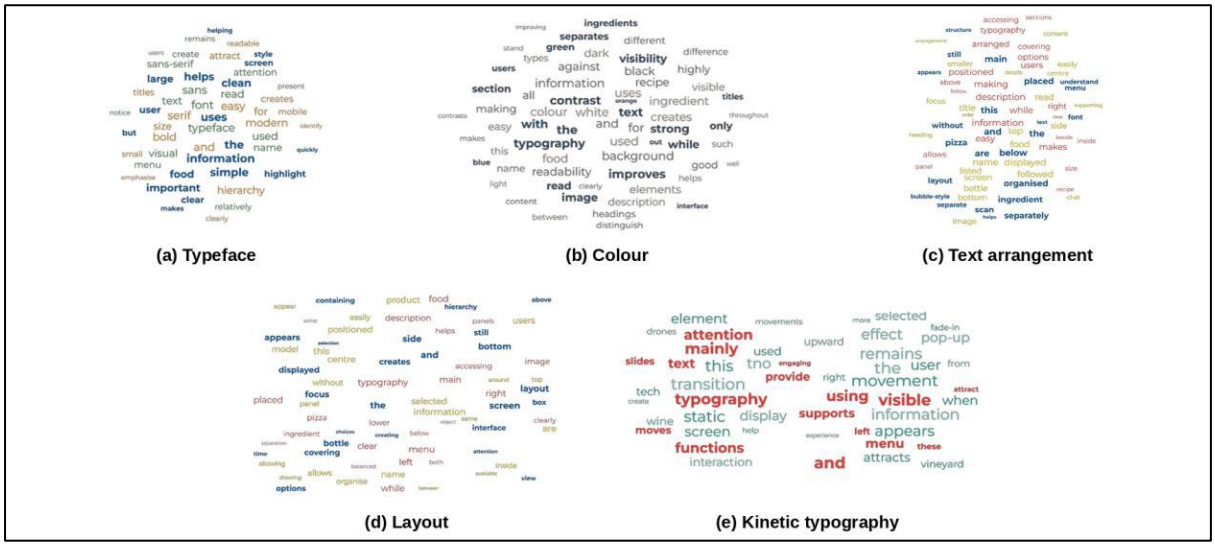


Figure 2 Word clouds of recurring terms in the coded descriptions: (a) typeface, (b) colour, (c) text arrangement, (d) layout and (e) kinetic typography

5 DISCUSSIONS

The results show a clear asymmetry. Stylistic typography in the sampled applications converges on a recognisable set of conventions, while dynamic typography is the exception. This qualifies the assumption that AR experiences are inherently dynamic: in these applications the food object can be viewed and manipulated, but in most of them the text does not change.

The placement of text around, rather than over, the AR object in all six applications (AR1 to AR6) indicates that designers treat the food as the primary content and the text as its annotation. This is consistent with the attention given to text placement in AR readability research (Cauz et al., 2024) and with the emphasis on clear, non-obstructive text overlays in AR design (Zulkifly et al., 2025). It also reflects the purpose that motivates AR food applications in the first place, which is to make the food itself visible and appealing (Fritz et al., 2023).

The colour findings are less settled. Where light text sits directly on imagery, as in AR1, its contrast depends on what the image or camera happens to show. Sawyer et al. (2020) showed that legibility at a glance is sensitive to background complexity, and a white label without a backing panel may lose contrast against a bright plate or tablecloth. The panel-based approaches in AR2, AR3 and AR4, which control the background behind the text, are arguably more robust in this respect, although readability was not tested directly in this study. The colour coding of information levels in AR3 and AR4 also provides a second cue for hierarchy, which the single-colour applications must achieve through weight and position alone.

The prevalence of sans-serif typefaces with bold weight for key information (AR1, AR2 and AR5) is consistent with the priority given to legibility and readability among the typographic properties of digital interfaces (Dick & Woloszyn, 2023). The same consistency, however, means that the sample shows little variation in typographic personality, which Dick and Woloszyn (2023) also treat as part of the user experience. Only AR5 used type expressively, and it was also the application that made the most use of motion.

The two cases of dynamic typography illustrate two distinct functions. In AR2, the pop-up transition acts as feedback that confirms a user selection, corresponding to the interaction-driven change described in mobile AR design patterns (Nikolarakis & Koutsabasis, 2024). In AR5, the staged sequence of upward, sliding and fade-in text builds a message over time, which reflects the expressive and emphatic use of kinetic typography described by Ford et al. (1997) and resembles the motion-led presentation that supported understanding in documentary typography (Mohd Zainuddin et al., 2025). That four applications use no text motion at all suggests that the potential of dynamic typography shown in motion design and generative research (Bai et al., 2024; Liu et al., 2025) has not yet been carried into AR food interfaces. One plausible explanation is the legibility cost of motion noted in the same literature: where the user is already moving the device and the object, designers may avoid additional text motion to keep information readable. This interpretation remains to be tested with users.

Because the analysis is descriptive, the findings show how typography is designed in these applications rather than how users respond to it. Statements about attention and engagement should therefore be read as the design intentions implied by the observed features, supported by prior literature, and not as measured outcomes.

6 CONCLUSIONS

This study analysed stylistic and dynamic typography in six AR food mobile applications through a qualitative content analysis. Stylistic typography followed consistent conventions: sans-serif typefaces in five applications, hierarchy created through bold weight and title-to-description ordering, light text or colour-coded levels of information, and, in all six applications, text positioned around the AR object so that the food remained the focal point. Dynamic typography was uncommon, appearing only in AR2 as a selection-triggered pop-up and in AR5 as a sequenced combination of upward movement, sliding and fade-in. Typography in these applications therefore functions mainly as a static annotation layer, with motion used selectively for feedback or emphasis.

For designers, the findings suggest three practical considerations: keep text peripheral to the AR object, as all six applications do; provide a controlled background, such as a panel, where text must remain legible over a live camera view; and consider transition and movement deliberately for feedback and emphasis rather than omitting them by default.

The study has several limitations. The sample is small and purposive, limited to six applications available at the time of data collection, and it includes one beverage application (AR5) whose product-label context differs from the menu-based applications. The analysis relied on researcher coding of screenshots and recordings and did not measure readability or user engagement. Future research should extend the sample across platforms and regions, compare menu, packaging and educational AR food applications, and test the identified patterns with users through readability tasks, eye tracking or interviews to establish their effect on comprehension and engagement.

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to my lecturers, Madam Nabila Aimi Mohamed Ghazali and Prof. Syarkawi Che Din, for their valuable guidance, support, and feedback throughout this research. Their knowledge and advice have greatly helped me in completing this study. I would also

like to thank my family and friends for their continuous support and encouragement. Finally, I am grateful to everyone who contributed directly or indirectly to the completion of this research.

FUNDING

This research is self-funded.

AUTHOR CONTRIBUTIONS

Hannah Zafreena Zulraidi conducted the data collection, performed the primary coding and prepared the initial draft. Nabila Aimi Mohamed Ghazali supervised the study, performed the independent coding and revised the manuscript. Sharkawi Che Din reviewed the consensus coding matrix and provided critical revision of the manuscript.

CONFLICT OF INTEREST

The authors declare no potential conflict of interest with respect to the research, authorship, and/or publication of this article.

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