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Enhancing digital engagement: The role of cognitive evaluations and affective aspects in airline web application commitment

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Abstract: The growing digitalization of airline services has increased competition, requiring airlines to enhance user experience on their web applications. However, a significant gap remains in understanding how cognitive evaluations and affective aspects influence behavioral commitment in airline web applications. While previous studies have examined these variables separately, limited research integrates them within a holistic model. This study investigates the impact of cognitive evaluations—perceived ease of use, perceived usefulness, perceived interactivity, perceived information quality, and e-trust—on e-satisfaction and how e-satisfaction mediates the relationship between cognitive evaluations and behavioral commitment. Data were collected from 398 airline web application users in Indonesia and analyzed using Partial Least Squares-Structural Equation Modeling (PLS-SEM). The results show that all cognitive evaluations, except perceived interactivity, significantly impact e-satisfaction. Moreover, e-satisfaction positively influences behavioral commitment, confirming its mediating role. These findings highlight the need for airlines to improve usability, ensure high-quality information, and build trust to enhance user engagement. The study contributes to the Cognitive-Affective-Behavior (C-A-B) model by integrating Technology Acceptance and Relationship Quality theories. Practically, it offers strategic recommendations for airlines to enhance web application functionality and foster long-term user commitment. The novelty of this research lies in its comprehensive approach to digital consumer behavior within the airline industry.

Keywords: *Airline web application, Cognitive evaluation, Digital consumer behavior, e-Commitment, e-satisfaction.*

1. Introduction

The rapid advancement of digital technology has transformed the global airline industry, with web applications emerging as essential platforms for enhancing customer experience and operational efficiency [1, 2]. Web check-in, paperless ticketing, and real-time updates have revolutionized airline service delivery and influenced customer expectations and engagement [3-5]. Fourteen registered airline companies in Indonesia utilizing web applications underscores the industry's digital shift [6]. Amidst intense competition from direct airline platforms and online travel agents, ensuring long-term user engagement with airline web apps has become a strategic imperative for sustaining business growth and customer loyalty. The urgency of this research lies in understanding the dynamics that influence user commitment to these digital platforms. With customers having diverse choices and easy switching options, enhancing user satisfaction and trust becomes pivotal. The need for research that comprehensively analyzes the cognitive evaluations (such as perceived ease of use, perceived usefulness, perceived interactivity, information quality, and e-trust) and affective responses (e-satisfaction) that drive behavioral commitment is both timely and significant [7, 8].

Maintaining consistent user engagement remains challenging despite the widespread adoption of airline web applications. Many users abandon these platforms after initial interactions, indicating gaps in meeting cognitive and affective expectations. While prior studies have addressed the roles of

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cognitive evaluations and affective aspects individually, limited research has integrated these dimensions to understand their combined impact on behavioral commitment, especially within Indonesia's airline sector. Additionally, existing literature provides inconclusive insights regarding the influence of perceived interactivity on user satisfaction, highlighting a gap that warrants further exploration. Moreover, the mediating role of e-satisfaction in the relationship between cognitive evaluations and behavioral commitment has been underexplored, creating a need for deeper investigation to inform effective engagement strategies.

This study adopts the Cognitive-Affective-Behavior (C-A-B) model as the foundational framework, integrating elements from the Technology Acceptance Model (TAM) and Relationship Quality Theory. The cognitive evaluations—including perceived ease of use, perceived usefulness, perceived interactivity, information quality, and e-trust—are posited to influence e-satisfaction (affective response), subsequently impacting behavioral commitment to airline web applications Park, et al. [9]; Rana, et al. [10] and Chaniago, et al. [11]. Previous studies affirm that perceived ease of use and usefulness significantly affect initial user acceptance, while trust and information quality are critical for sustaining long-term satisfaction Han and Sa [12]; Zacharis [13] andFauziah, et al. [14]. However, the role of interactivity remains debatable. By focusing on these relationships, this research seeks to clarify how cognitive and affective aspects interact to shape behavioral commitment in the context of airline web applications.

The primary problem addressed in this study is the challenge of fostering behavioral commitment among airline web application users in Indonesia. Specifically, the research seeks to answer:

- How do cognitive evaluations (perceived ease of use, perceived usefulness, perceived interactivity, information quality, and e-trust) influence e-satisfaction?
- How does e-satisfaction affect behavioral commitment to airline web applications?
- Does e-satisfaction mediate the relationship between cognitive evaluations and behavioral commitment?
- Moreover, related to the problem statement above, the objective of this research is as follows:
- To examine the influence of cognitive evaluations on e-satisfaction among airline web application users.
- To analyze the impact of e-satisfaction on behavioral commitment.
- To investigate the mediating role of e-satisfaction in the relationship between cognitive evaluations and behavioral commitment.

This study contributes to the theoretical discourse by extending the application of the C-A-B model within the context of airline web applications. It integrates TAM and Relationship Quality Theory constructs to comprehensively understand the interplay between cognitive, affective, and behavioral dimensions. The research also addresses gaps in the literature concerning the mediating role of e-satisfaction, particularly in emerging markets like Indonesia, thereby enriching theoretical insights related to digital user engagement. Practically, the findings offer actionable insights for airline companies aiming to enhance user engagement and commitment through strategic improvements in their web applications. Recommendations will focus on enhancing the cognitive aspects of user experience, such as simplifying navigation, ensuring high information quality, and building trust. These strategies can inform digital marketing initiatives and technological innovations that foster sustainable user commitment. The novelty of this study lies in its integrative approach to examining how cognitive evaluations influence affective responses and, consequently, behavioral commitment. Focusing on Indonesia's airline industry, the research provides localized insights currently underrepresented in the literature. Moreover, it uniquely explores the mediating role of e-satisfaction, contributing new perspectives to the discourse on user engagement in digital platforms. This approach enhances academic understanding and offers practical solutions for optimizing user retention strategies in competitive digital environments.

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2. Literature Review

2.1. Relevance of Theory to Research Topic

This study integrates the Cognitive-Affective-Behavior (C-A-B) model, the Technology Acceptance Model (TAM), and the Relationship Quality Theory to analyze the behavioral commitment of users to airline web applications. The C-A-B model provides a holistic perspective by examining user behavior's cognitive, affective, and behavioral dimensions. TAM emphasizes the importance of perceived ease of use and usefulness as determinants of technology acceptance. At the same time, Relationship Quality Theory contributes insights into trust and satisfaction as key factors in maintaining long-term relationships. These theories are highly relevant to the research topic as they collectively explain how cognitive evaluations influence affective responses and subsequently shape behavioral commitment in the digital environment of airline web applications.

2.2. Definition of Variables

- Perceived Ease of Use (PEOU): Defined as the extent to which users believe using the web app is free of effort [15]. PEOU positively influences e-satisfaction as ease of use enhances the user's interaction experience, leading to higher satisfaction levels.
- Perceived Usefulness (PU) refers to the belief that using the web app enhances task performance [15]. PU influences satisfaction because users value systems that contribute to efficient task completion, such as booking and managing travel.
- Perceived Interactivity (PI): Describes how interactive users perceive the web application, emphasizing responsiveness and engagement [16]. Interactivity is believed to enhance satisfaction through engaging user experiences.
- Perceived Information Quality (PIQ): This measure reflects how much the web app provides accurate, timely, and relevant information [17]. High-quality information fosters trust and satisfaction, influencing long-term user commitment.
- E-Trust: Denotes users' trust in the web application's security and reliability [18]. Trust reduces perceived risks and fosters satisfaction and behavioral commitment.
- E-Satisfaction: The affective response derived from cognitive evaluations indicates users' overall satisfaction with the web application [19].
- Behavioral Commitment: The degree to which users intend to continue engaging with the airline web application [20].

2.3. Previous Research

Studies consistently show that perceived ease of use and usefulness are critical in shaping user satisfaction and behavioral commitment Amin, et al. [21] and Shang and Wu [22]. Interactivity has been recognized as a factor that enhances user engagement, though its influence on satisfaction is debated [23]. Information quality is a well-established determinant of satisfaction, ensuring that users feel informed and supported during their interactions [24]. Trust has been emphasized as pivotal in reducing user uncertainties and increasing commitment [18]. Furthermore, research by Wang and Liao [25] highlights that users' perception of a platform's usefulness significantly predicts their satisfaction, while [26] found that trust is instrumental in fostering long-term user engagement. However, limited research has examined these variables collectively within the Indonesian airline context, presenting a gap this study seeks to address.

2.4. Research Framework

The research framework is structured based on the C-A-B model, with cognitive evaluations (PEOU, PU, PI, PIQ, and e-trust) influencing the affective response (e-satisfaction), shaping behavioral commitment. This framework systematically analyzes how initial user perceptions and experiences translate into long-term engagement with airline web applications. The explanation is as follows:

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- Cognitive Evaluations → Affective Response → Behavioral Commitment
- Cognitive Variables: Perceived ease of use, perceived usefulness, perceived interactivity, perceived information quality, and e-trust.
- Affective Variable: E-satisfaction.
- Behavioral Variable: Behavioral commitment.

The framework emphasizes the mediating role of e-satisfaction, positing that positive cognitive evaluations enhance satisfaction, subsequently strengthening behavioral commitment. This structure is supported by previous empirical research, ensuring that the study is grounded in established theoretical foundations while also contributing new insights into the dynamics of digital engagement in the airline industry context.

3. Research Methods

This study employs a quantitative research design using a cross-sectional approach to analyze the effect of cognitive evaluations and affective aspects on behavioral commitment in airline web applications. The research framework is grounded in the Cognitive-Affective-Behavior (C-A-B) model, Technology Acceptance Model (TAM), and Relationship Quality Theory, ensuring a comprehensive examination of the variables.

3.1. Population and Sampling

The target population for this research comprises Indonesian consumers who actively use official airline web applications. A purposive sampling method was applied to ensure that the selected respondents had relevant experience using airline web apps. The inclusion criteria required respondents to have been active official airline web app users within the past six months. Three hundred ninety-eight respondents were successfully collected through an online survey, meeting the requirement for a sample size suitable for multivariate analysis (200-500 respondents) [27-29].

3.2. Data Collection

Data was collected using an online questionnaire structured into three sections:

- Section 1: Respondent demographic information, including age, gender, occupation, and income level.
- Section 2: Measurement items for cognitive evaluations (perceived ease of use, perceived usefulness, perceived interactivity, perceived information quality, and e-trust), affective aspects (e-satisfaction), and behavioral commitment.
- Section 3: Questions related to respondent behavior and experiences using airline web applications.

Each item was measured using a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree), adapted from validated sources [21, 30].

3.3. Data Collection

Data processing involved several stages to ensure accuracy and validity:

- Data Cleaning: Screening for incomplete or inconsistent responses.
- Descriptive Analysis: Using SPSS 25.0 to analyze demographic profiles and essential respondent characteristics.
- Measurement Model Assessment: Using SmartPLS 3.2.7 to evaluate reliability and validity through Composite Reliability (CR), Average Variance Extracted (AVE), and outer loadings. Discriminant validity was assessed using the Fornell-Larcker criterion and Heterotrait-Monotrait (HTMT) ratio.
- Structural Model Assessment: Analyzed the direct and indirect relationships between variables.

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Path coefficients, t-values, and p-values were calculated using bootstrapping with 5,000 subsamples to test hypothesis significance.

- Effect Size (f2): Evaluated the strength of relationships between variables. Effect sizes were interpreted as small (f2 > 0.02), medium (f2 > 0.15), and large (f2 > 0.35).
- Predictive Relevance (Q2): This was determined through the blindfolding procedure. Q2 values above zero indicated good predictive relevance for the model.

3.3. Validity and Reliability

Reliability and validity tests confirmed that all constructs met internal consistency and convergent validity criteria. CR values exceeded 0.7, and AVE values were above 0.5, confirming construct reliability and validity. Discriminant validity was verified through the Fornell-Larcker criterion and HTMT ratio, with all constructs meeting the required standards. This methodological approach ensures that the research findings are robust, reliable, and valid, providing a strong foundation for analyzing the influence of cognitive evaluations and affective aspects on behavioral commitment to using airline web applications.

4. Results

4.1. Demographic Profile of Respondents

398 valid responses were collected from Indonesian airline web application users. The gender distribution included 41.96% male and 58.04% female respondents. Most respondents (62.06%) were aged between 21 and 30 years. Most respondents held at least a certificate-level education (37.19%), with private employees making up 73.12% of the sample. The most common household income range was IDR 3.1 million – IDR 5 million (38.19%). The study also identified the most frequently used airline web applications. Garuda Indonesia had the highest user base (42.21%), followed by Lion Air (36.43%), Citilink (33.67%), Batik Air (25.38%), and AirAsia Indonesia (23.62%). The highest number of respondents resided in DKI Jakarta (54.52%), with smaller proportions in Surabaya (7.79%), Bandung (5.78%), and other cities across Indonesia.

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4.2. Measurement Model Assessment

The measurement model was evaluated using Composite Reliability (CR), Average Variance Extracted (AVE), and factor loadings to assess reliability and validity. CR values exceeded 0.7, indicating strong internal consistency. AVE values were all above 0.5, demonstrating convergent validity. Discriminant validity was assessed using the Fornell-Larcker criterion and Heterotrait-Monotrait (HTMT) ratio, confirming that each construct was distinct.

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4.3. Structural Model Assessment

The structural model was analyzed using Partial Least Squares-Structural Equation Modeling (PLS-SEM) with bootstrapping (5,000 subsamples) to determine the significance of the hypothesized relationships. The path coefficients, t-values, and p-values confirmed several significant relationships:

- Perceived Ease of Use → E-Satisfaction ($\beta = 0.135$, $t = 2.310$, $p < 0.01$) – Supported.
- Perceived Usefulness → E-Satisfaction ($\beta = 0.124$, $t = 2.150$, $p < 0.01$) – Supported.
- Perceived Interactivity → E-Satisfaction ($\beta = 0.010$, $t = 0.158$, $p > 0.05$) – Not Supported.
- Perceived Information Quality → E-Satisfaction ($\beta = 0.379$, $t = 5.906$, $p < 0.001$) – Supported.
- E-Trust → E-Satisfaction ($\beta = 0.224$, $t = 3.829$, $p < 0.001$) – Supported.
- E-Satisfaction → Behavioral Commitment ($\beta = 0.173$, $t = 3.403$, $p < 0.001$) – Supported.

The findings indicate that perceived ease of use, usefulness, information quality, and trust

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significantly enhance e-satisfaction. However, perceived interactivity did not significantly affect e-satisfaction.

4.4. Mediation Analysis

The mediation effects of e-satisfaction were examined, confirming that:

- E-Satisfaction mediates Perceived Ease of Use → Behavioral Commitment ($\beta = 0.023$, $t = 1.996$, $p < 0.05$).
- E-Satisfaction mediates Perceived Usefulness → Behavioral Commitment ($\beta = 0.021$, $t = 1.856$, $p < 0.05$).
- E-Satisfaction does not mediate Perceived Interactivity → Behavioral Commitment ($\beta = 0.002$, $t = 0.161$, $p > 0.05$).
- E-Satisfaction mediates Perceived Information Quality → Behavioral Commitment ($\beta = 0.066$, $t = 2.816$, $p < 0.001$).
- E-Satisfaction mediates E-Trust → Behavioral Commitment ($\beta = 0.039$, $t = 2.647$, $p < 0.01$).

4.5. R-Squared and Predictive Relevance (Q^2)

The structural model demonstrated strong predictive power:

- R^2 for E-Satisfaction = 0.547, indicating that cognitive evaluations explain 54.7% of variance in e-satisfaction.
- R^2 for Behavioral Commitment = 0.330, meaning 33.0% of the variance in behavioral commitment is explained by e-satisfaction.
- Q^2 for E-Satisfaction = 0.373 > 0, demonstrating predictive relevance.
- Q^2 for Behavioral Commitment = 0.181 > 0, confirming the model's validity

These results validate the theoretical framework, showing that cognitive evaluations drive e-satisfaction, which fosters behavioral commitment. However, perceived interactivity was an insignificant predictor of e-satisfaction, suggesting that other user engagement factors may be more influential.

5. Discussion

5.1. Relationship Between Cognitive Evaluations and Affective Aspect (E-Satisfaction)

The findings confirm that most cognitive evaluation variables significantly impact e-satisfaction when using airline web applications. Perceived ease of use, perceived usefulness, perceived information quality, and e-trust significantly positively affect e-satisfaction. These results align with previous studies, including those of Amin, et al. [21] and Shang and Wu [22] emphasizing the importance of ease of use and usefulness in enhancing user satisfaction. Users are more likely to engage with airline web applications when they perceive them as easy to navigate and beneficial for their travel needs. This supports the Technology Acceptance Model (TAM), which posits that ease of use and usefulness drive user satisfaction and adoption of technology-based services [15]. Given these findings, airline companies should prioritize improving usability and functionality by simplifying navigation, enhancing mobile responsiveness, and optimizing booking processes. Ensuring an intuitive interface will increase perceived ease of use and usefulness, leading to higher satisfaction and long-term commitment. However, perceived interactivity did not significantly influence e-satisfaction. This contradicts prior studies, such as those by Cyr, et al. [23] who argue that interactivity enhances user engagement and satisfaction. One possible explanation is that users prioritize efficiency and information accuracy over interactive features when booking flights. Unlike e-commerce platforms that rely on high engagement levels, airline web applications may require a more functional and transactional approach to ensure seamless booking experiences. Prior research by Lee and Naidoo [3]; Errichiello, et al. [31] and Kurnia, et al. [32] suggested that perceived interactivity plays a significant role in hedonic digital platforms but has a limited effect on transactional services. Although interactivity does not significantly impact satisfaction, airlines may still benefit from personalized engagement through AI-driven

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recommendations and tailored promotions to enhance customer retention.

Perceived information quality plays a crucial role in shaping e-satisfaction. The results corroborate [24] findings that high-quality information builds trust and enhances satisfaction. Customers value accurate, real-time flight schedules, pricing, and promotional offers, which reduce uncertainty and facilitate decision-making. Relationship Quality Theory suggests that high-quality and reliable information fosters long-term engagement and enhances satisfaction with online services [17]. To strengthen their web applications, airlines must ensure transparency in pricing, provide up-to-date flight details, and make personalized recommendations based on customer preferences. E-trust also significantly impacts e-satisfaction, consistent with McKnight, et al. [18]. Trust in airline web applications is particularly crucial, as users need assurance regarding secure transactions, privacy protection, and reliable customer support. Airlines should strengthen security measures and transparency to foster long-term customer relationships. Previous studies by Amin, et al. [21] and Errichiello, et al. [31] highlighted that trust is vital in digital service adoption, particularly in industries involving financial transactions, supporting the Relationship Quality Theory framework. Therefore, airlines must invest in cybersecurity, enforce clear data privacy policies, and maintain responsive customer service to enhance user trust and satisfaction. A high level of trust ensures that users feel secure when transacting through airline web applications, ultimately reinforcing behavioral commitment.

5.2. Relationship Between Affective Aspect (E-Satisfaction) and Behavioral Commitment

The study confirms that e-satisfaction significantly influences behavioral commitment, supporting findings from Gustafsson, et al. [33] and Curth, et al. [34]. Users who experience higher satisfaction with airline web applications are likelier to continue using them, demonstrating loyalty towards a particular airline's digital platform. This aligns with the Commitment-Trust Theory [35] which asserts that trust and satisfaction are the foundation for long-term user commitment. Positive emotional experiences with the web application drive behavioral commitment. When users feel satisfied with usability, functionality, and trustworthiness, they develop an attachment that reduces the likelihood of switching to competing platforms. The study by Oliver [19] further supports this notion, highlighting that affective responses such as satisfaction mediate between cognitive evaluations and long-term user engagement. Given the strong influence of satisfaction on commitment, airlines should leverage this understanding to enhance user experience. Seamless interactions, personalized engagement, and loyalty programs can reinforce customer commitment and increase retention rates. Maintaining high-quality service delivery, competitive pricing, and transparent communication will further enhance customer trust and long-term digital engagement.

5.3. Mediating Role of E-Satisfaction

The study further validates the mediating role of e-satisfaction between cognitive evaluations and behavioral commitment. Perceived ease of use, perceived usefulness, perceived information quality, and e-trust indirectly influence behavioral commitment through e-satisfaction. These findings align with Xu and Koronios [17] and Cyr, et al. [23] who assert that satisfaction bridges cognitive perceptions and behavioral intentions. The results reinforce the Cognitive-Affective-Behavior (C-A-B) model, confirming that cognitive evaluations shape affective responses, subsequently driving behavioral outcomes. However, the mediation effect of e-satisfaction between perceived interactivity and behavioral commitment was insignificant. This result reinforces the earlier finding that interactivity may not be a primary driver of satisfaction in airline web applications. Unlike social media or entertainment platforms, airline web applications focus on transactional efficiency rather than interactive engagement. Studies by Gustafsson, et al. [33] and Curth, et al. [34] suggested that interactivity plays a more substantial role in hedonic digital environments than utilitarian services, supporting the finding that interactivity does not significantly affect satisfaction in transactional platforms.

Despite this, airline companies should consider enhancing user engagement through alternative

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means. While interactivity alone may not directly influence satisfaction, integrating personalized services such as customized notifications, relevant promotional offers, and targeted content can enhance user experiences and promote long-term commitment. Airlines can leverage AI-driven insights to predict user preferences and provide tailored content that aligns with customer expectations, fostering digital engagement and loyalty. By integrating these theoretical perspectives, this study provides a comprehensive understanding of user behavior in airline web applications. The results extend prior research by applying established models to the Indonesian airline industry, offering valuable insights into digital consumer behavior within this specific context. Furthermore, the findings emphasize the importance of usability, information quality, and trust in driving e-satisfaction, which ultimately translates into behavioral commitment. Practical strategies focusing on improving these aspects will allow airlines to optimize their digital platforms, enhance customer experiences, and secure long-term user engagement.

6. Conclusion

This study provides empirical evidence on the relationship between cognitive evaluations, affective responses, and behavioral commitment in the context of airline web applications. The findings highlight that perceived ease of use, usefulness, information quality, and e-trust significantly influence e-satisfaction, which fosters behavioral commitment. However, perceived interactivity does not significantly impact e-satisfaction, indicating that users prioritize functionality and trust over interactive features when using airline web applications.

Despite its contributions, this study has several limitations. First, it focuses solely on the Indonesian airline industry, limiting the generalizability of findings to other countries or industries. Future research could explore similar models in different cultural or business contexts. Second, this study primarily relies on self-reported survey data, which may introduce response bias. A mixed-method approach incorporating qualitative insights could provide a more comprehensive understanding of user behavior. Third, while the study examines the mediating role of e-satisfaction, other potential mediators, such as perceived risk or brand reputation, were not considered and could be explored in future research.

This study extends the Cognitive-Affective-Behavior (C-A-B) model by integrating key constructs from the Technology Acceptance Model (TAM) and Relationship Quality Theory. It validates the role of e-satisfaction as a mediator between cognitive evaluations and behavioral commitment, reinforcing the importance of usability, trust, and information quality in digital service adoption. Furthermore, Airline companies should enhance their web applications by focusing on usability improvements, high-quality information dissemination, and robust security measures to build customer trust. Personalized engagement strategies, such as AI-driven recommendations and loyalty programs, could strengthen long-term commitment.

Future studies should explore how external factors, such as market competition, airline branding, and economic conditions, influence customer commitment to digital services. Additionally, longitudinal studies could examine how customer preferences evolve, providing deeper insights into sustaining behavioral commitment in airline web applications.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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