



Expert Validation of a Faith-Informed Sensemaking Model for Online Risk

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Research Article

Abstract:

The digital age brought about increasing concerns among Muslim parents on online risks and its potential impacts on their children. For this purpose, this research addressed the needs in assisting Muslim parents sensemaking of online risks by introducing the integration of online-risk taxonomy and *Maqasid al-Shariah* into the sensemaking model originally introduced by Pirolli and Card. These two frameworks served as scaffolding, mapped specifically to the 'Organize' and 'Schematize' phases of the sensemaking model. Within the Organize phase, risks were classified into Content, Contact, Conduct and Contract while within Schematize, each risk's significance was evaluated with reference to the five *Maqasid* objectives (Faith, Life, Intellect, Lineage, Wealth). An eight-item instrument mapping these constructs was evaluated by four domain experts. Unanimous relevance ratings were achieved for every item (I-CVI = 1.00; S-CVI/Ave = 1.00), thereby confirming strong content validity. The findings therefore support the model's conceptual coherence and cultural resonance at this stage, while further empirical testing with Muslim parents is still required.

Keywords: Sensemaking; Online risks; Content validation; Faith-informed design; Design science research

1. INTRODUCTION

Children's constant presence online is widely understood to expose them to risks such as inappropriate content, harmful interactions, and exploitative behaviours. For Muslim parents, this challenge is compounded by the responsibility of ensuring that guidance is consistent with Islamic values (1). Faith-based reasoning has rarely been incorporated into existing parental mediation tools, leaving a gap between recognising online risks and making value-driven decisions. In this study, an established Human-Computer Interaction (HCI) sensemaking model is adapted and integrated with two complementary knowledge structures: (i) an online-risk taxonomy that articulates what kind of risk is faced, and (ii) *Maqasid al-Shariah* that articulates why an Islamic objective is threatened. This integration supports parents in articulating the type of risk encountered and interpreting its significance through the lens of Islamic objectives. Expert validation of the adapted model is reported, and a pathway towards empirical evaluation with parents is proposed. A design-science research (DSR) methodology underpins this study, guiding both the conceptual modelling and the development of the validation instrument. The DSR evaluation framework, employing the lenses of Utility, Quality, and Efficacy, was adopted to ensure rigorous content validity (2,3). Accordingly, this study should be understood as a design-science research artefact proposal, accompanied by expert content validations. At this stage, contribution lies in the conceptual integration and validation of content relevance, whereby the empirical validation would be shown in future phases of the DSR lifecycle.

1.1 Sensemaking

Sensemaking refers to the process through which individuals interpret and give meaning to complex situations (4). In the context of cognition, it involves applying higher-order skills such as mental modelling, comprehension, creativity, and situational awareness (5). Rather than simply processing information, sensemaking is an active and interpretive activity where individuals synthesize fragmented data into a coherent mental overview to guide decisions and action (6).

Several major theories of sensemaking have been advanced across different domains. According to Turner *et al.* (7), the five dominant theoretical areas are: (i) Weick's organizational communication framework, (ii) Dervin's approach in information behaviour, (iii) Snowden's model in knowledge management, (iv) Klein's framework in cognitive systems engineering, and (v) Russell's formulation within Human-Computer Interaction (HCI).

Pirolli and Card's sensemaking model (8), co-developed with Russell, is particularly influential in HCI. It proposes a two-loop model comprising a foraging loop for information gathering and a sensemaking loop for organizing and interpreting that information. Within the foraging loop, people actively seek, filter, and extract relevant information, often arranging it into structured representations that support deeper analysis. This stage draws on Pirolli and Card's foundational concepts

in information foraging (9) and remains a core element of their 2005 model. In contrast, the sensemaking loop focuses on progressively reorganizing and refining the gathered information to construct a clear and cohesive mental framework. Through this iterative cycle, users are able to detect patterns, derive insights, and make decisions grounded in their continually evolving understanding (8).

1.2 Online Risk

Online risks refer to potential harms such as loss of privacy, credibility, finances, or control of digital assets especially during activities like searching, sharing, and communicating online under uncertainty (10). Despite these risks, children increasingly turn to the Internet for learning, social interaction, and developing digital competencies vital for education and future employment (11). Recent evidence also suggests that digital parenting does not operate as a one-size-fits-all strategy, as its associations with children's digital wellbeing vary across mediation types and outcomes (12).

To conceptualize these risks, the 4C framework developed through large-scale initiatives by UNICEF, OECD, and the European Commission categorizes online risks into four domains: Content, Contact, Conduct, and Contract (13). This taxonomy has become a dominant model in research and policymaking on child online safety.

Parental mediation plays a key role in addressing online risks. Mediation strategies include restrictive rules, co-usage, active monitoring, and critically active mediation, where parents and children engage in open discussion about online experiences (14,15). Active mediation has been shown to promote critical thinking and digital resilience by helping children interpret and contextualize their experiences (16,17). Research further shows that parental mediation is shaped by parents' resources, knowledge, attitudes, and self-efficacy, indicating that parents differ in their readiness to guide children's online experiences (18).

In this light, sensemaking is closely tied to the process of mediation. It underpins how parents recognize, interpret, and discuss online threats with their children especially within value-based frameworks. For Muslim parents in particular, this includes fulfilling a spiritual and moral responsibility to guide their children's digital engagement in accordance with Islamic teachings.

However, much of the parental-mediation literatures focus on behavioural regulation, risk exposure, or digital skills, with less attention to how parents interpret online risks through explicit moral or faith-based reasoning. This leaves an important gap for culturally grounded models that support not only risk recognition, but also value-informed interpretation and discussion.

1.3 Islamic Values

Islamic values are moral and ethical principles derived from the Qur'an and Sunnah, rooted in spiritual obligations and exemplified by the Prophet Muhammad (19). Within Islam, parenting plays a pivotal role in transmitting these values. Children are believed to be born in a pure state (*fiṭrah*), and it is the parents' responsibility to nurture them as Muslims (20). This emphasis is captured in *Surah Luqman* (31:12–19), which frames parental advice as a spiritual duty, emphasizing gratitude, monotheism, prayer, humility, moral conduct, and enjoining good while forbidding evil (21,22).

In navigating the digital world, these values may serve as interpretive tools for parents making sense of their children's online exposures. Rather than viewing online risks solely through secular classifications, Muslim parents may turn to the *Maqasid al-Shariah*, the higher objectives of Islamic law as a guide to evaluate the moral implications of digital content and interactions (23). At the same time, recent HCI scholarship indicates that research on religion and spirituality remains comparatively limited and fragmented, despite growing interest in the area (24).

Traditionally, five essential objectives are emphasized: the protection of faith (*ḥifẓ al-dīn*), life (*ḥifẓ al-nafs*), intellect (*ḥifẓ al-ʿaql*), lineage (*ḥifẓ al-nasl*), and wealth (*ḥifẓ al-māl*) (23,25). These *Maqasid* are regarded as necessary for individual and societal well-being. Contemporary scholars have expanded this framework to address modern challenges, integrating principles such as dignity, justice, and social welfare (26). In this study, these five classical *Maqasid* categories are used to scaffold parents' interpretation of online risks, serving as a value-based lens to complement existing risk taxonomies. By mapping perceived threats to corresponding *Maqasid*, parents are supported in morally appraising digital exposures in ways that resonate with their religious commitments. Recent work has also begun to connect *Maqasid al-Shariah* directly to adolescents' digital competency, showing how the preservation of faith, life, intellect, lineage, and wealth can be used to frame responsible digital engagement in Islamic terms (27).

Despite growing interest in digital ethics, religion, and technology, few HCI-oriented models operationalise Islamic moral reasoning within a structured parental-support framework. The present study addresses that gap by translating *Maqasid al-Shariah* from a general ethical lens into a scaffold for sensemaking in a specific online-risk context.

2. CONCEPTUAL MODEL

The underlying sensemaking phases in the conceptual model is adapted from Pirolli & Card's sensemaking (8). Here they are comprised of six iterative phases namely Search, Collect, Organize, Schematize, Hypothesize, and Present. For the purposes of faith-aligned proactive parental mediation, the two stages judged most amenable for scaffolded support namely Organize and Schematize were selected for integration. Figure 1 shows the conceptual model.

In this model, the process starts by searching for a particular item (Search), and after being displayed a list of possible risks that could be associated with that item, parents choose those that they agreed with (Collect). In the next phase, one of the two scaffolded phases, Organize is mapped onto the widely recognized four-category taxonomy of online risks, the 4C framework of content, contact, conduct, and contract (13). In this phase based on the model, parents begin assigning the risks they have selected to these categories. This act makes implicit threat recognition explicit, creating a stable reference point for the moral evaluation that follows.

Following Organize, the next phase is Schematize, mapped to the five *Maqasid al-Shariah* objectives which are preservations of Faith, Life, Intellect, Lineage, and Wealth (23). Here, parents are invited to consider which of these objectives might be harmed from the dimension of risks identified in the previous phase.

The process continues to Hypothesize where parents are presented with their deliberations thus far and they can refine assumptions and reassess risks based on context, and finally it ends at Present where they may want to communicate their findings to their children or other fellow Muslim parents.

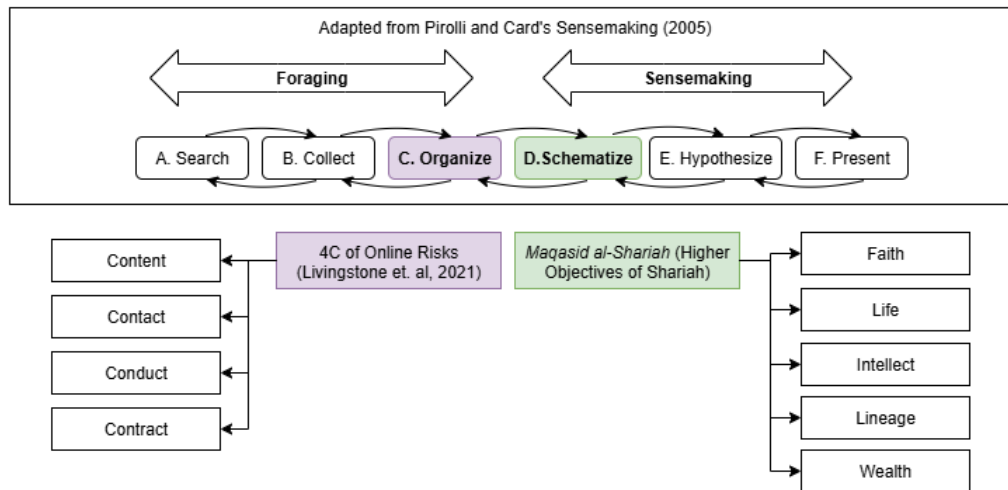


Figure 1. Faith-informed sensemaking of online risks conceptual model.

Of primary concern in this research is the two adjustments to the two phases of Organize and Schematize where the two are mapped to 4C Online Risk framework and *Maqasid al-Shariah* respectively. The mapping can be understood by visualizing it as a matrix where the columns show the type of digital risk (what), and the rows represent why it is a threat from an Islamic moral perspective (why). For example, in Table 1, by framing a direct message feature of a platform as a 'contact' type risk, parents can more easily recognize its potential to jeopardise the preservation of 'Life' in the *Maqasid* categories.

Table 1. Item 'Direct message' considered from risk and faith dimensions.

	Content	Contact	Conduct	Contract
Faith	/	/	/	/
Life	/	Direct message	/	/
Intellect	/	/	/	/
Lineage	/	/	/	/
Wealth	/	/	/	/

In this expert validation, the two phases are defined operationally as: Organize – to structure or sort information about online risks in a way that enables clearer understanding. In this model, parents organize risk information by categorizing it into the 4C framework (content, contact, conduct, contract); and Schematize – to interpret structured information by reasoning about its significance using one's values or principles. In this model, parents use Maqasid al-Shariah (Faith, Life, Intellect, Lineage, Wealth) to reason about why a risk matters.

3. METHODS

For the purposes of validating the inclusion of frameworks from online risks and Islamic values, and also the suitability of mapping the two phases of Organize, and Schematize to these frameworks, a content validation was conducted. Content validation is done based on expert judgement (28).

3.1 Expert Panel

A purposive sampling strategy was employed to recruit an interdisciplinary panel of four Malaysian academics (mean experience≈14 years). Invitations were issued to senior scholars who satisfied two criteria: (i) a record of peer-reviewed publications in either digital-media sensemaking or Islamic-centred ICT research, and (ii) a minimum of ten years' teaching and supervision. Two invitees were professor and associate professor of digital-media and crisis-communication whose work applies sensemaking models to Southeast-Asian contexts, while the remaining two were scholars in Qur'anic ethics and educational technology whose research links Islamic values to information management and technology. Combined

citation counts exceeded 1800 and the mean h-index was 9, thereby evidencing scholarly standing. Gender balance (2 F / 2 M) and institutional diversity (four separate public universities) were also achieved. Names and affiliations are withheld to maintain focus on the panel's expertise and selection criteria rather than individual identities.

Although a four-expert panel is acceptable for CVI-based content validation, the resulting agreement should be interpreted as an initial expert judgement rather than broad consensus across all relevant stakeholders. The purpose of this phase was to assess content relevance and conceptual fit, not to establish generalisability or real-world effectiveness.

3.2 Instrument

Utility (U), Quality (Q), and Efficacy (E) have been identified in Design-Science Research as core evaluation dimensions through which an artefact's usefulness, internal consistency, and outcome-attainment potential can be judged (23). These three lenses were therefore adopted as content-validity constructs prior to item specification. In this instrument, a four-step scale-development procedure was adopted.

- 1) *Construct specification*: Two content-validity objectives were formulated on the basis of the study aim:
 - O1. To validate the incorporation of online risks and Islamic values into the sensemaking model.
 - O2. To confirm the conceptual and practical alignment between (a) the 4C framework and the Organize phase, and (b) the Maqasid al-Shariah and the Schematize phase.

Objective O1 addresses the overall integration lens and therefore taps Utility (U), Quality (Q), and Efficacy (E). Objective O2 was operationalised as two sub-objectives, O2a (Organize ↔ 4C) and O2b (Schematize ↔ *Maqasid*). Sub-objective O2a was assessed for Utility (U) and Quality (Q) only, because the 4C taxonomy is already an established classification and its practical effectiveness does not require further efficacy testing. Sub-objective O2b was assessed for U, Q, and Efficacy (E) to capture its anticipated impact on parental moral reasoning. This mapping yielded three construct clusters: overall integration (U, Q, E), Organize–4C alignment (U, Q), and Schematize–*Maqasid* alignment (U, Q, E).

- 2) *Item generation*: Eight declarative statements were Bloom-style verbs that reflect sensemaking activities such as categorizing, interpreting, and aligning. Each statement was tied to a specific objective–DSR lens pair to avoid redundancy and ensure full coverage of the construct. Table 2 shows the eight statements.
- 3) *Format and scaling*: Each statement was placed on a four-point relevance scale (1 = strongly disagree, 4 = strongly agree) to minimise central-tendency bias and allow direct calculation of the I-CVI and S-CVI/Ave indices. Items were grouped and presented by construct to maintain conceptual clarity.
- 4) *Content-validity planning*: The final eight items were formatted in a fillable PDF, with comment boxes included to capture optional qualitative explanations. Item-level CVI (I-CVI) was then calculated as the proportion of ratings ≥ 3, and subscale-level as well as overall S-CVI/Ave values were computed.

Table 2. Validation statements derived from objectives.

Objective	DSR Property	Validation Statement
Validate incorporation of online risks & Islamic values	Utility	The model supports Muslim parents in sensemaking of online risks.
	Quality	The model presents online risks and Islamic values elements in a clear, structured, and logically consistent way.
	Efficacy	The application of the <i>Maqasid al-Shariah</i> framework in the Schematize phase provides a strong theoretical basis for interpreting the significance of online risks.
Confirm alignment of 4C with Organize phase	Utility	The 4C framework in the Organize phase supports Muslim parents in categorizing online risks.
	Quality	The mapping between the 4C framework and the Organize phase is clear, structured, and logically consistent.
Confirm alignment of <i>Maqasid</i> with Schematize phase	Utility	The Maqasid al-Shariah framework in the Schematize phase supports Muslim parents in interpreting online risks.
	Quality	The mapping between the Maqasid al-Shariah framework and the Schematize phase is clear, structured, and logically consistent.
	Efficacy	The application of the Maqasid al-Shariah framework in the Schematize phase provides a strong theoretical basis for interpreting the significance of online risks.

3.3 Procedure

A sequential mixed-mode approach was used. First, short email invitations were sent to the four shortlisted academics to confirm their interest and availability. After receiving positive responses, the eight-item review instrument and supporting materials were sent electronically. Each expert then took part in a 30-minute online meeting, which included a brief presentation outlining the research rationale and the Organize and Schematize mapping. This was followed by an open discussion for verbal feedback and clarification questions. Experts were then asked to complete the Likert-scale rating

sheet offline and return it by email. All completed forms were received. Item-level CVIs were calculated as the proportion of ratings ≥ 3 , and subscale-level as well as overall S-CVI/Ave values were computed.

4. RESULTS

4.1 CVI Metrics

Agreement was defined in advance as any item receiving a rating of 3 (“Agree”) or 4 (“Strongly Agree”) on the four-point scale. Ratings of 1 or 2 were considered non-agreement. When 3–5 experts are used, an I-CVI of 1.00 is required (29), (30). Scale-level CVI (S-CVI/Ave) was computed as the average of all I-CVIs. All items received unanimous agreement (I-CVI = 1.00), yielding S-CVI/Ave = 1.00 for each sub-scale and the overall instrument. Table 3 summarises the calculated scale-level indices. Perfect agreement was achieved for every subscale as well as for the instrument as a whole.

Table 3. Scale-level content-validity indices.

Construct	No. of Items	S-CVI/Ave
Integration (Utility/Quality/Efficacy)	3	1.00
Organize → Risk Typology	2	1.00
Schematize → Maqasid al-Shariah	3	1.00
Overall	8	1.00

These S-CVI/Ave values indicate complete agreement among experts across all construct clusters and since all 8 items received ratings of 3 or 4 from all four experts in this study, it meets the standard of 1.00. In light of the small number of experts in this study, this research does not claim a generalisability of the framework, rather the results show the proposed mappings were considered appropriate and meaningful by the selected experts at the content-validation stage.

4.2 Qualitative Insights

Experts agreed on the clarity and relevance of the Organize and Schematize mapping and provided several suggestions for refinement. One recommendation was to incorporate a brief onboarding question, such as “What is your goal today?”, to surface parental intentions (*niyyah*) before engaging in risk categorisation. Another suggestion was to add annotations linking each risk category to its corresponding *Maqasid* objective, thereby supporting reflective moral appraisal during the review process.

Additional comments focused on improving flexibility and clarity. Reviewers proposed including “other” option so that parents could add risks they believe are relevant but not represented in the predefined list. They also noted that certain risks are inherently subjective and might benefit from accompanying justifications to provide greater context. Some experts observed that risks may correspond to multiple *Maqasid* objectives and suggested exploring ways to highlight these connections as potentially valuable insights. Finally, reviewers emphasised the importance of ensuring that the *Maqasid* linkages genuinely support each identified risk so that the framework remains conceptually coherent and well-aligned with its intended purpose.

5. DISCUSSION

The unanimous ratings suggest that experts found the proposed integration conceptually meaningful and sufficiently well specified for further development. More importantly, the findings indicate that Pirolli and Card’s sensemaking model can be extended with domain-specific scaffolds that help users move from identifying a digital risk to interpreting why that risk matters within a value system. This positions the study as a theoretical contribution at the intersection of HCI sensemaking, child online safety, and Islamic ethical reasoning.

These results support the choice of Pirolli & Card’s Organize and Schematize stages for parental mediation, along with the integration of the 4C taxonomy and *Maqasid al-Shariah* objectives. Expert feedback provides both theoretical validation and cultural alignment, linking HCI sensemaking theory with domain-specific risk and moral frameworks in a coherent manner.

Within the HCI context, the sensemaking model draws on interaction science, whereas the 4C and *Maqasid* frameworks originate from online risk classification and Islamic laws research. The interdisciplinary nature of this integration required expert validation to confirm that it remains faithful to both disciplinary traditions and appropriate for future interface design.

This study extends prior research on parental mediation and online-risk classification by moving beyond the identification of risks alone toward structured moral interpretation. Whereas existing studies commonly emphasise mediation strategies, risk exposure, or digital competence, the present model contributes an HCI-oriented mechanism that links risk categorisation with value-based reasoning. In this sense, the model offers a conceptual bridge between sensemaking theory, child online safety research, and faith-informed digital parenting.

Nevertheless, this study does not yet demonstrate whether parents can use the model consistently, whether the proposed mappings improve sensemaking quality, or whether the framework leads to better faith-based alignment outcomes. These questions require subsequent prototype-based evaluation with Muslim parents using usability testing, and quantitative validation once the artefact has been operationalised.

6. CONCLUSION

Expert review of the proposed two-phase sensemaking scaffold produced perfect content-validity scores, providing preliminary support for the relevance and clarity of the conceptual integration. These findings justify proceeding to the next design-science stage, but they should not be interpreted as evidence that the model has already been empirically validated in real parental settings.

This study contributes (i) a validated conceptual integration of HCI sensemaking with domain-specific risk and ethical frameworks, (ii) a structured instrument for content-validity assessment in interdisciplinary contexts, and (iii) design considerations for future prototype development.

The limitation of this study comes from the small size of the panels, comprising only four reviewers, which limits the generalisability of findings. However, this size aligns with established practice in content-validity studies, where small, purposively selected panels allow for in-depth, domain-specific evaluation. The reviewers were deliberately chosen for their recognised expertise in sensemaking, communication, online risks, social media, and the integration of Islamic values in ICT, the areas directly aligned with the conceptual scope of this study. This ensured that the assessment drew on deep, relevant knowledge spanning both the theoretical and applied dimensions of the framework. While the unanimous high scores provide strong initial support, subsequent stages will seek feedback from a broader range of stakeholders, including end-users, to validate and refine the model further.

Future work will follow the Design-Science Research cycle, instantiating the validated model into interface prototypes with design affordances to support users in the sensemaking processes. Iterative design–develop–evaluate rounds with Muslim parent participants will assess usability, user experience including spiritual dimensions which may be used to further refine the artefacts of both model and instantiations.

AUTHORSHIP CONTRIBUTION STATEMENT

Fadzlin Ahmadon: writing – original draft, data curation, formal analysis; Murni Mahmud: supervision, conceptualization; Muna Azuddin: writing – review and editing.

DATA AVAILABILITY

Data are available within the article.

DECLARATION OF COMPETING INTEREST

The authors declared that there are no conflicts of interest regarding the publication of this paper.

DECLARATION OF GENERATIVE AI

The authors used a generative AI tool during the preparation of this manuscript to assist with language editing, grammar checking, and sentence restructuring. No generative AI tool was used to generate data, conduct analysis or interpret results.

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