Interactive Technologies Lab
hcigroup
of the University of Patras

CHIGREECE CHAPTER 2025
Connect. Engage. Inspire.

Deceptive Design Patterns on Health Applications

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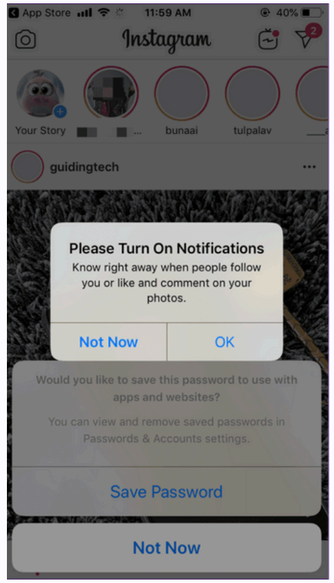
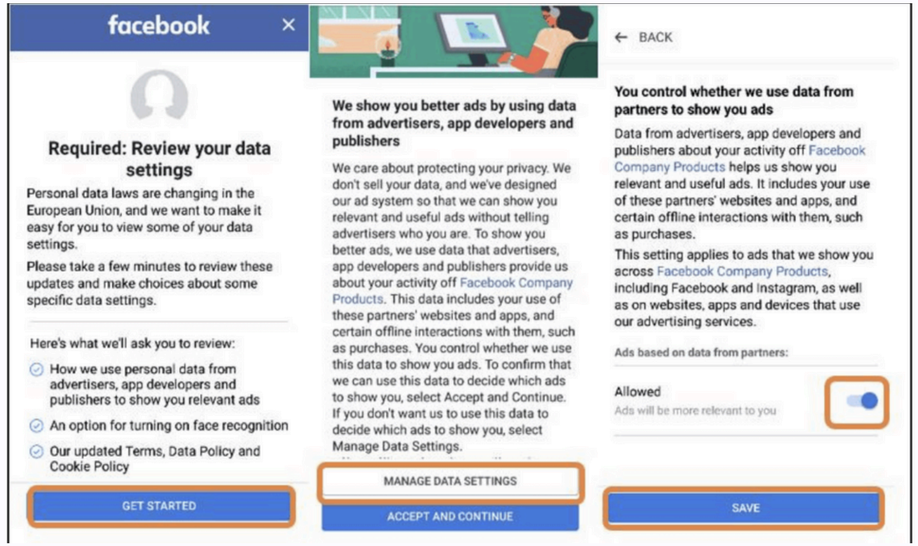
Deceptive Design Patterns



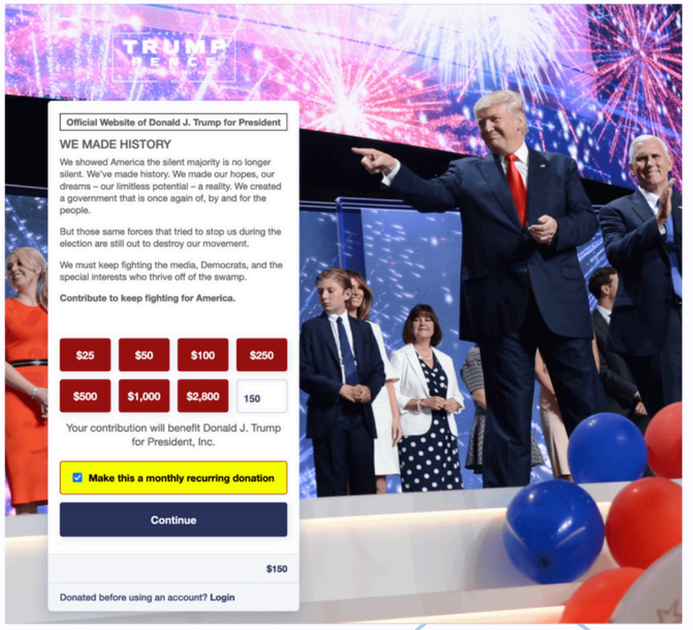
Nagging

interrupts the user with a request to do something



Obstruction

creates obstacles or roadblocks in the user's path



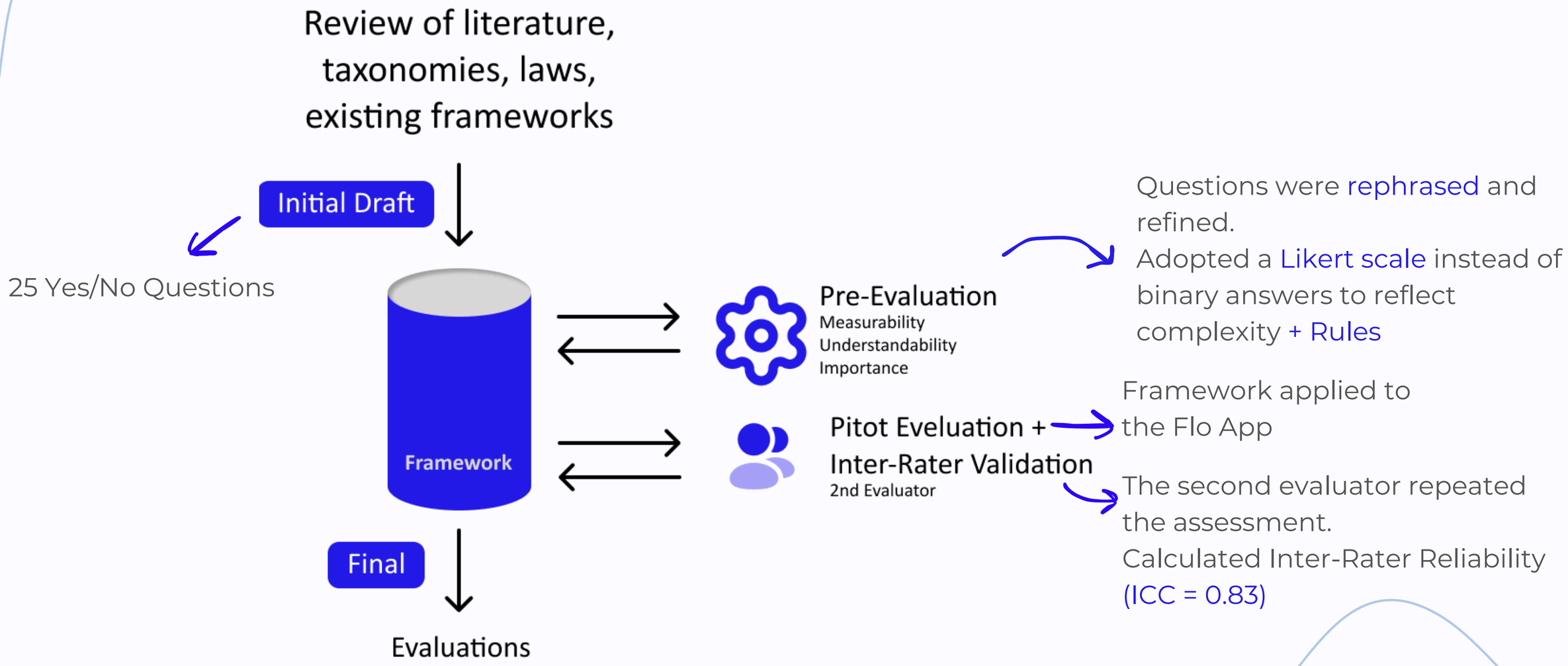
Preselection

pre-ticked checkbox, putting items in the user's shopping cart, or pre-selecting items in a series of steps

Research Questions

RQ1: To what extent do representative health-related applications contain deceptive design patterns?

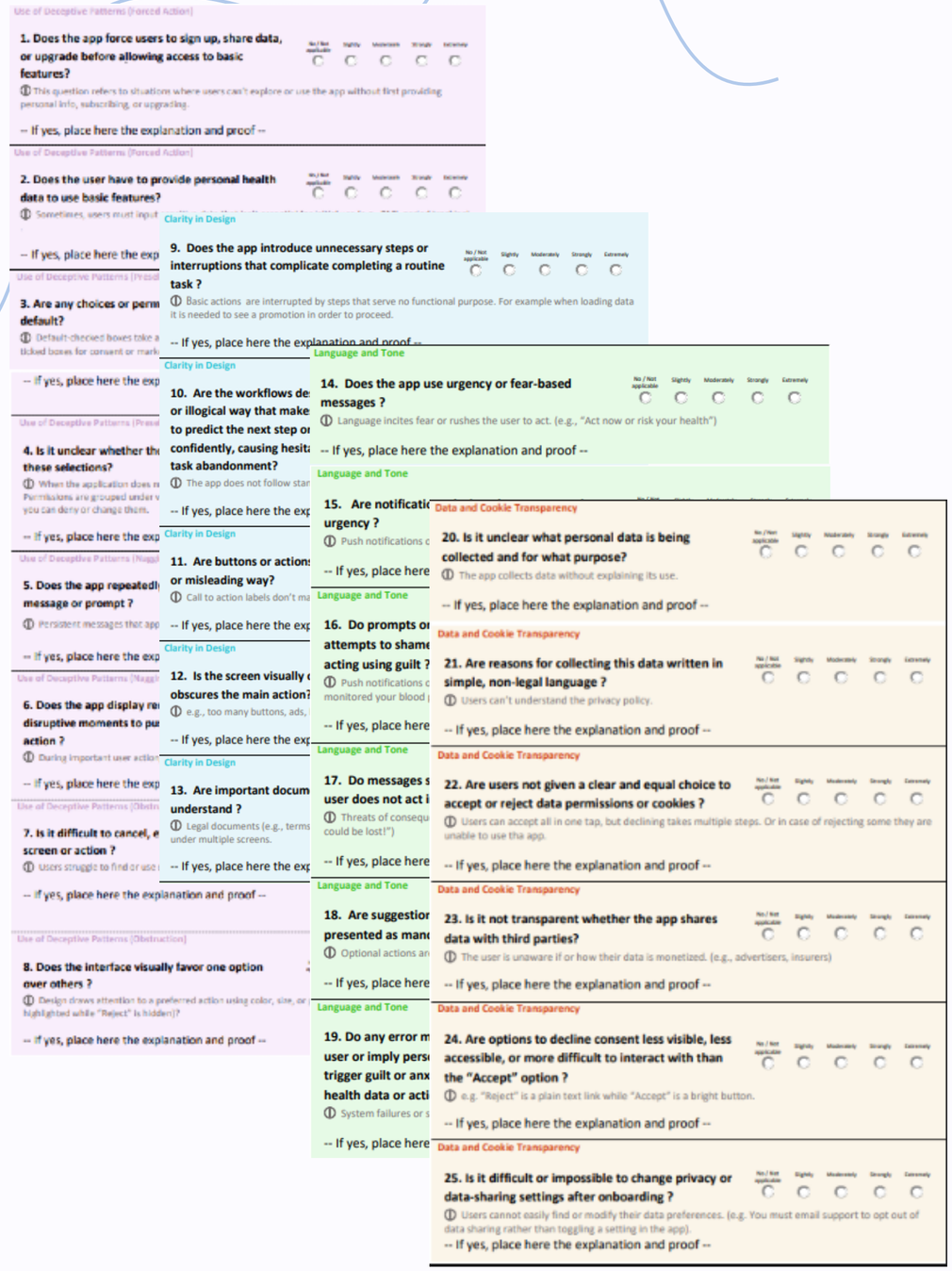
RQ2: How useful and understandable is the proposed evaluation framework for identifying and assessing deceptive design patterns in health-related applications?



Questions were rephrased and refined.
Adopted a Likert scale instead of binary answers to reflect complexity + Rules

Framework applied to the Flo App

The second evaluator repeated the assessment.
Calculated Inter-Rater Reliability (ICC = 0.83)



Score	Label	UX Impact	Concerns
1	Not at all / Not applicable	Not present	No ethical concern
2	Slightly	Rare, doesn't alter flow	Ethically safe
3	Moderately	Noticeable, creates hesitation	Raises ethical questions
4	Strongly	Repeated and persuasive	Undermines autonomy
5	Extremely	Pervasive, manipulative	Emotionally/legally dangerous

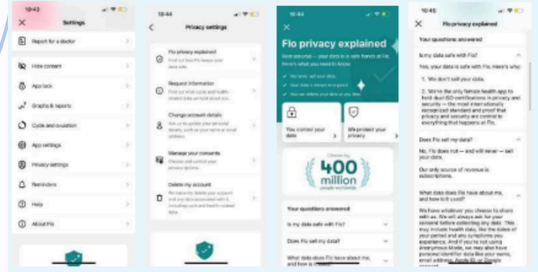
$$Normalized\ Score = \frac{Answer's\ Score - 1}{4}$$

$$\text{Final Score} = \frac{\text{Total Score}}{N}$$

N is the number of the framework's questions.

Index (0-1)	Interpretation
0.00 – 0.25	**Low** – Minimal or no deceptive patterns present. Ethical design observed.
0.26 – 0.50	**Moderate** – Some problematic elements present; design may affect clarity or autonomy.
0.51 – 0.75	**High** – Significant presence of deceptive patterns, user manipulation likely.
0.76 – 1.00	**Critical** – Pervasive and harmful design choices; serious ethical concerns.

Terms and conditions are hidden under collapsible menus and hard to understand

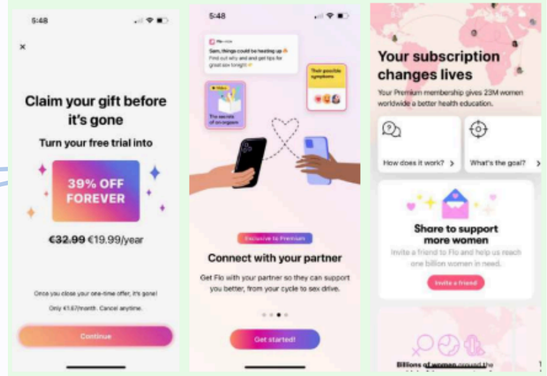


Language and Tone

14. Does the app use urgency or fear-based messages ?

No / Not applicable | Slightly | Moderately | Strongly | Extremely

ⓘ Language incites fear or rushes the user to act. (e.g., "Act now or risk your health")

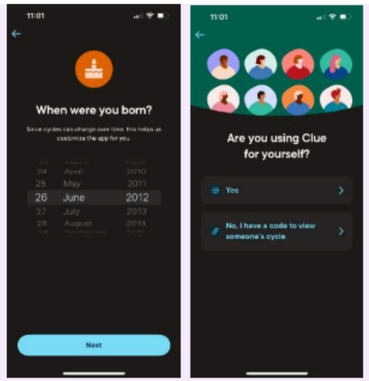


Language and Tone

15. Are notifications designed to create panic or urgency ?

No / Not applicable | Slightly | Moderately | Strongly | Extremely

ⓘ Push notifications or in-app notifications pressure users using alarming phrasing.



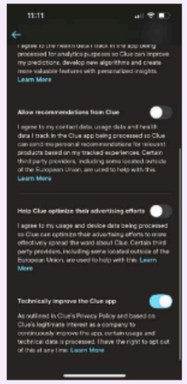
Use of Deceptive Patterns (Preselection)

3. Are any choices or permissions preselected by default?

No / Not applicable | Slightly | Moderately | Strongly | Extremely

ⓘ Default-checked boxes take advantage of user inattention. Users must actively uncheck to opt out (e.g., ticked boxes for consent or marketing).

Only some of the options



-- If yes, place here the explanation and proof --

Language and Tone

15. Are notifications designed to create panic or urgency ?

No / Not applicable | Slightly | Moderately | Strongly | Extremely

ⓘ Push notifications or in-app notifications pressure users using alarming phrasing.

-- If yes, place here the explanation and proof --

Language and Tone

16. Do prompts or messages use language that attempts to shame, or pressure the user into acting using guilt ?

No / Not applicable | Slightly | Moderately | Strongly | Extremely

ⓘ Push notifications or in-app notifications pressure users using alarming phrasing. (e.g. "You haven't monitored your blood pressure today . Are you neglecting your health?")

-- If yes, place here the explanation and proof --

Language and Tone

17. Do messages suggest negative outcomes if the user does not act immediately ?

No / Not applicable | Slightly | Moderately | Strongly | Extremely

ⓘ Threats of consequences unless the user takes instant action. (e.g. "Without this upgrade, your data could be lost!")

-- If yes, place here the explanation and proof --

Language and Tone

18. Are suggestions or recommendations presented as mandatory actions ?

No / Not applicable | Slightly | Moderately | Strongly | Extremely

ⓘ Optional actions are framed as required.

-- If yes, place here the explanation and proof --

Language and Tone

19. Do any error messages in the app blame the user or imply personal failure in a way that could trigger guilt or anxiety, particularly in relation to health data or actions ?

No / Not applicable | Slightly | Moderately | Strongly | Extremely

ⓘ System failures or skipped actions are framed as user faults.

-- If yes, place here the explanation and proof --

Data and Cookie Transparency

20. Is it unclear what personal data is being collected and for what purpose ?

No / Not applicable | Slightly | Moderately | Strongly | Extremely

ⓘ The app collects data without explaining its use.

Use of Deceptive Patterns (Preselection)

Is it unclear that the user has control over these lections?

No / Not applicable | Slightly | Moderately | Strongly | Extremely

When the application does not make it obvious that users can change their preferences. For example, rmissions are grouped under vague headings like "optimize experience," with no clear indication that u can deny or change them.

e annual plan is visually emphasized.

Use of Deceptive Patterns (Nagging)

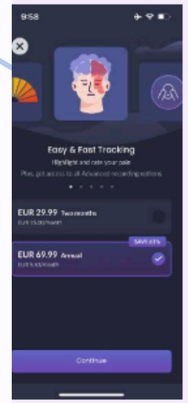
Does the app repeatedly show the same essage or prompt ?

No / Not applicable | Slightly | Moderately | Strongly | Extremely

Persistent messages that appear frequently (e.g., push to upgrade, allow tracking) .

ultiple screens urge upgrades "Take control today!", "Experience MBplus", and the

Bplus card is persistent in the main feed.



Use of Deceptive Patterns (Nagging)

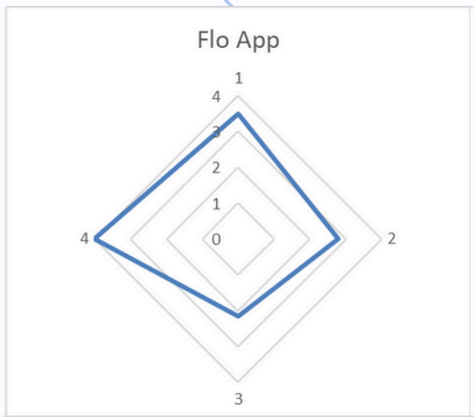
Does the app display reminders at strategically sruptive moments to push the user toward an tion ?

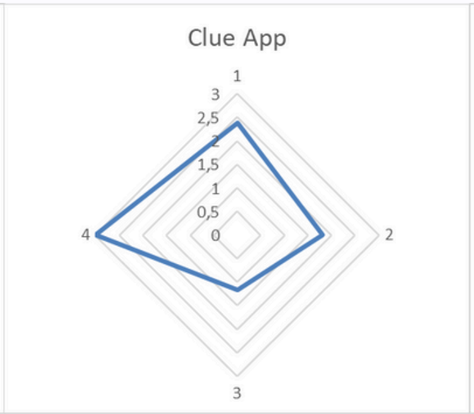
No / Not applicable | Slightly | Moderately | Strongly | Extremely

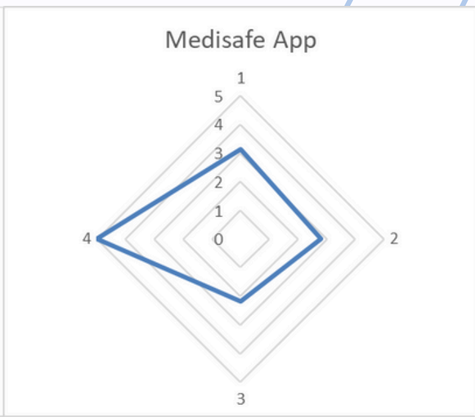
During important user action, for example during task completion or exist .

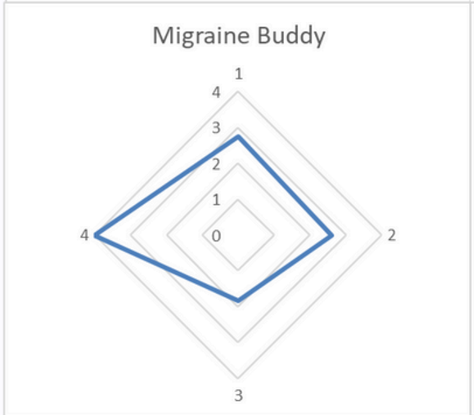
pgrade prompts are shown during the migraine attack tracking flow

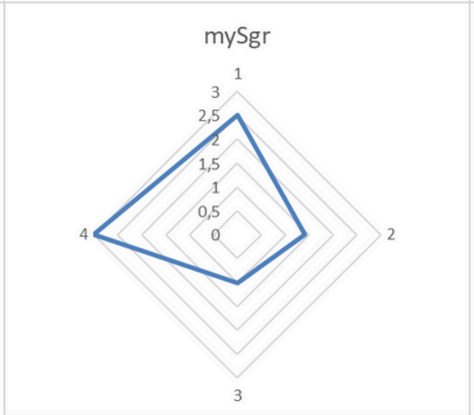
	Q#	Flo	Clue	My Health	Doctor Anytime	Medi safe	Migraine Buddy	My Sugr	Glucose Buddy
Use of Deceptive Patterns	1	4	3	5	1	3	4	4	4
	2	4	3	5	1	3	3	4	4
	3	2	2	1	1	2	2	3	2
	4	3	2	1	1	2	2	2	2
	5	4	2	1	1	4	3	2	2
	6	3	2	1	1	4	3	2	2
	7	4	2	1	1	3	2	1	1
	8	4	3	1	1	4	3	2	3
Clarity In Design	9	3	2	2	2	3	3	2	2
	10	2	1	1	1	2	3	1	1
	11	2	1	1	1	2	2	1	1
	12	3	2	1	1	3	2	1	2
	13	4	3	2	1	4	3	2	2
Language and Tone	14	3	1	1	1	3	2	1	1
	15	2	1	1	1	2	2	1	1
	16	2	1	1	1	2	2	1	1
	17	2	1	1	1	2	2	1	1
	18	3	2	1	1	3	2	1	1
	19	1	1	1	1	1	1	1	1
Data and Cookie Transparency	20	4	3	5	4	5	4	3	4
	21	4	3	5	4	5	4	3	4
	22	4	3	5	4	5	4	3	4
	23	4	3	5	4	5	4	3	4
	24	4	3	5	4	5	4	3	4
	25	4	3	5	4	5	4	3	4

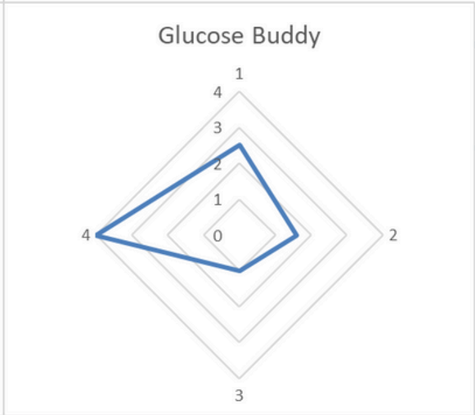

Flo App
1
2
3
4
0
1
2
3
4

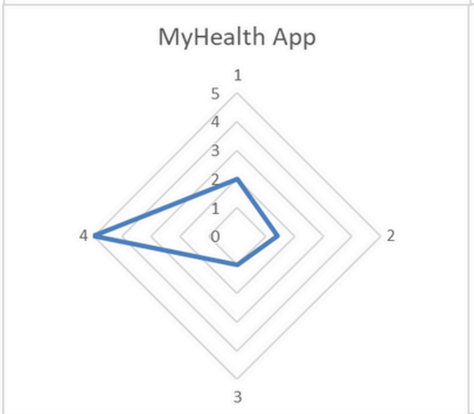

Clue App
1
2
3
4
0
0,5
1
1,5
2
2,5
3

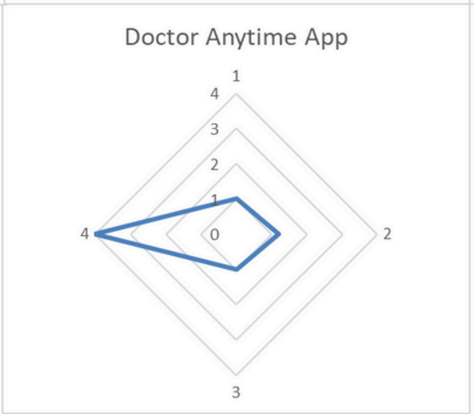

Medisafe App
1
2
3
4
0
1
2
3
4
5


Migraine Buddy
1
2
3
4
0
1
2
3
4


mySgr
1
2
3
4
0
0,5
1
1,5
2
2,5
3


Glucose Buddy
1
2
3
4
0
1
2
3
4


MyHealth App
1
2
3
4
0
1
2
3
4
5


Doctor Anytime App
1
2
3
4
0
1
2
3
4

Discussion & Interpretation

- Apps relying on data monetization (Flo, Medisafe) scored highest.
- Even public apps (MyHealth) showed major transparency issues.
- B2B platforms (Doctoranytime) had fewer manipulative patterns.
- The line between persuasion and deception is often blurred.

All representative apps contained some level of deceptive design **(RQ1)**.
The framework was effective and reliable, and usable **(RQ2)**, but further validation is needed.

Thank You