

TIM MOESGEN 15.03.2022

'OKAY GOOGLE, WHAT ABOUT MY PRIVACY?': USER'S PRIVACY PERCEPTIONS AND ACCEPTANCE OF VOICE BASED DIGITAL ASSISTANTS

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2021

STARTING POINT

- VBDA emerged as important trend in the last decade
- cutting edge AI tech to observe and process complex data in real-time in order to enable information retrieval on user input
- however, highly personalised experiences only through the collection of sensitive and private user data and passive listening
- How do users (in India) adopt these technologies considering these privacy risks?

RQS

- 1. How do (Indian) consumers of voice-based digital assistants (VBDA) perceive risk and privacy concerns?**
- 2. How do these perceptions influence the adoption of such technologies?**

HYPOTHESES

- H1. Perceived privacy risk positively influences perceived privacy concerns.**
- H2. PPR negatively influence perceived trust.**
- H3. PPR negatively influence behavioural intentions.**
- H4. PPC negatively influence the adoption of VBDA by consumers.**
- H5. perceived trust can positively influence performance expectations from VBDA.**
- H6. Perceived trust can positively influence consumers' intentions to adopt VBDA.**

METHOD

- **Quantitative survey with 252 respondents (35% female) who were students from premier management schools in India —> active on social media and tech-savvy, easy to reach (age: 86 per cent were below 35 y.o.a)**
- **Survey contained variables of performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, and price value (from UTAUT 2) + perceived risk, perceived privacy concerns, and trust**
- **via Likert scales (1 strongly disagree - 5 strongly agree)**
- **Statistical Analysis: Structural equation modelling (SEM)**

RESULTS

perceived risk,
 perceived privacy concerns,
 trust,
 performance expectancy,
 effort expectancy,
 social influence,
 facilitating conditions,
 hedonic motivation,
 price value,
 behavioural intention,
 adoption

Indicators	Mean	S.D.	Skewness	Kurtosis
PPR1: PDA data may be sold to third parties?	3.75	1.137	-.712	-.204
PPR2: Personal Data in PDA may be misused?	3.71	1.102	-.613	-.261
PPR3: PDA data could be given to unidentified persons or companies without my consent	3.82	1.129	-.784	-.095
PPR4: PDA Data could be made available to government agencies?	3.41	1.132	-.199	-.709
PPC1: I am concerned that the information I submit to (PDA) could be misused.	3.36	1.265	-.339	-.905
PPC2: I am concerned that a person can find private information about me through PDA.	3.34	1.236	-.258	-.897
PPC3: I am concerned about submitting information to PDA, because what others might do with it.	3.27	1.203	-.196	-.816
PPC3: I am concerned about submitting information to PDA, because it could be used in a way I did not foresee	3.37	1.243	-.292	-.931
TR1: PDAs are safe environments in which to exchange information with others	2.85	.995	.103	-.347
TR2: PDAs are reliable environments in which to conduct business transactions	2.84	1.071	-.040	-.562
TR3: PDAs handle personal information submitted by users in a competent fashion	3.12	1.002	-.130	-.422
TR4: I think that PDAs are trustworthy	2.96	1.067	.012	-.586
TR5: I feel assured that legal and technological structures adequately protect me from problems on PDAs	2.90	1.085	-.047	-.634
PE1: I find PDAs useful in my daily life.	3.59	.981	-.458	-.118
PE2: Using PDAs increases my chances of achieving tasks that are important to me.	3.34	.943	-.262	-.295
PE3: Using PDAs helps me accomplish tasks more quickly.	3.51	1.021	-.481	-.273
PE4: Using PDAs increases my productivity	3.40	1.024	-.185	-.516
EE1: Learning how to use PDA is easy for me.	3.95	.928	-.721	.041
EE2: My interaction with PDA is clear and understandable.	3.59	.985	-.568	-.101
EE3: I find PDA easy to use.	3.83	1.056	-.892	.255
SI1: People who are important to me think that I should use PDA.	2.84	.975	.194	-.279
SI2: People who influence my behaviour think that I should use PDA.	2.88	.986	.225	-.130
<i>(continued)</i>				
SI3: People whose opinions that I value prefer that I use PDA.	3.01	.965	-.024	-.012
FC1: I have the resources necessary to use PDA.	3.80	.902	-.857	.950
FC2: I have the knowledge necessary to use PDA.	3.92	.818	-.640	.378
FC3: PDA is compatible with other technologies I use	3.67	.853	-.663	.556
HM1: Using PDA is fun.	3.85	.881	-.688	.427
HM2: Using PDA is enjoyable.	3.82	.889	-.803	1.001
HM3: Using PDA is entertaining.	3.82	.895	-.795	.792
PV1: PDA is reasonably priced.	3.40	.854	-.450	.253
PV2: PDA is good value for the money.	3.44	.853	-.286	.042
PV3: At the current price, PDA provides good value.	3.47	.904	-.373	.198
BI1: I intend to use PDA in the future.	3.75	.928	-.813	.874
BI2: I will always try to use PDA in my daily life.	3.23	1.081	-.271	-.505
BI3: I plan to use PDA in future.	3.72	.900	-.781	.890
Frequency: When was the last time you used a mobile phone to use the following features by Voice-based Digital Assistant (5: Today, 4: Past 7 Days, 3; Past 30 Days, 2; More than 90 days, 1: Never):				
Adotion1: Alarm	3.09	1.524	-.108	-1.451
Adotion2: Reminder	2.82	1.456	.058	-1.405
Adotion3: Weather	2.87	1.460	.075	-1.383
Adotion4: News	2.89	1.588	.075	-1.544

Table 5
Hypotheses testing.

Relationships	β -values	p-Value	Supported?
UTAUT2 Constructs and relationships			
Performance-Expectancy → Behavioral-Intention	0.370	***	Yes
Effort-Expectancy → Behavioral-Intention	-0.311	0.002	Yes
Social-Influence → Behavioral-Intention	0.212	***	Yes
Perceived-Value → Behavioral-Intention	0.138	0.020	Yes
Hedonic-Motivation → Behavioral-Intention	0.504	***	Yes
Facilitating-Conditions → Behavioral-Intention	0.203	0.001	Yes
Facilitating-Conditions → Adoption	0.155	0.035	Yes
Behavioral-Intention → Adoption	0.306	***	Yes
Effort-Expectancy → Performance-Expectancy <-Effort-EEE	0.686	***	Yes
Additional Privacy related constructs and relationships			
H1: Perceived-Risk → Perceived-Privacy Concern	0.657	***	Yes
H2: Perceived-Risk → Perceived-Trust	-0.565	***	Yes
H3: Perceived-Risk → Behavioral-Intention	0.070	0.444	No
H4: Perceived-Privacy Concerns → Behavioral-Intention	-0.137	0.080	No
H5: Perceived-Trust → Performance-Expectancy	0.328	***	Yes
H6: Perceived-Trust → Behavioral-Intention	0.188	0.026	Yes

(*** represents coefficients significant at $p < 0.001$ level).

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WHY DO CONSUMERS TOLERATE PRIVACY RISKS?

- **privacy calculus theory**: consumers make a trade-off between risk and benefit (Laufer and Wolfe 1977)
- “in line with the privacy calculus theory, [...] people who believe VBDA to be useful (= high performance expectancy) cared less about privacy concerns” than the ones who think VBDA benefits them less (= low PE)

Table 6
Post hoc analysis.

Relationships	Low-performance expectancy			High-performance expectancy		
	β -values	p-Value	Supported?	β -values	p-Value	Supported?
Perceived-Privacy Concerns → BI	-0.209	0.015	Yes	-0.019	0.904	No
Perceived-Risk → BI	0.104	0.315	No	0.009	0.961	No

IMPLICATIONS

- VBDA seen as amusement/entertainment device rather than as utility tool
(impact of **hedonic motivations** on adaption > impact of **performance expectancy** on adoption)
- trust is an important factor in adopting these technologies —> continue to securing this trust
- consumers make decisions on privacy calculus
—> safeguard interests of consumer who hands over personal data in exchange for utility
—> take necessary steps to reduce privacy concerns so that other consumers also adopt
VDBA

LIMITATIONS

- respondents were highly educated and had a technology background → non-representative**
- questionnaire was in English and respondents were expected to be well-versed in this language → doesn't include speakers of Indian languages**
- quantitative approach does not allow in-depth exploration of consumers perception**