



Impact of Personality Traits (BFI-2-XS) on using Cloud Storage

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Keywords: Personality Traits, BFI-2-XS, Cloud Storage.

Abstract: Cloud storage is a trending issue shifting away from computing as a product that is purchased, to computing as a service that is delivered to consumers over the internet from large-scale data centres - or "clouds". The research focused on impact of Big Five Inventory personality traits on use of cloud storage services. The research was conducted in the Czech Republic. The respondents were 478 university students. Gender, age, and type of student's job were used as control variables. With regards to the results, openness to experience and gender influence the acceptance rate of cloud storage services.

1 INTRODUCTION

Peter Meel and Tim Grace from The National Institute of Standards and Technology (NIST) define cloud computing as "Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction." (Mell and Grace, 2011)

Cloud computing services are traditionally divided as follows:

(a) Software as a Service (SaaS) – clients use provided applications running on provider's infrastructure;

(b) Platform as a Service (PaaS) – clients deploy and manage their own application on provider's infrastructure (hardware and software);

(c) Infrastructure as a Service (IaaS) – clients use provider's hardware infrastructure for their computing needs but maintain control over all software, storage, and networks; and

(d) Storage as a Service – (StaaS)—clients use provider's infrastructure to store files such as documents, photos, archives. (Katzan, 2011)


Probably the first article investigating a link between personality traits and (a behavioural


intention to) use of cloud services was Aharony (2015). From the Big Five Inventory, the study included only openness to experience, and it was significantly correlated with a behavioural intention to use cloud computing by information professionals.

Trust was found to significantly influence behavioural intention to use cloud storage (Santoso et al, 2018) (trust is a facet of agreeableness). But it is necessary to stress that in this article, trust was defined as "an individual's willingness to provide their personal information at risk while in a state of uncertainty", the concept taken from Milne and Culnan (2004).

Alam et al (2018) considered several traits, none of them from the Big Five Inventory. Some of the investigated traits significantly influenced cloud computing adoption among Malay-owned SMEs in Malaysia.

It may be expected that it is more tech-savvy users who use cloud storage. Previous research (Santoso et al, 2018, Pavlicek et al 2017, Olexova et al 2017, Sudzina, 2015) identified that men, less neurotic, and more open to experience people perceive themselves as more tech-savvy. Alohali et al. (2018), who focused on use of technology from a security perspective, found out the consciousness was significantly correlated to 19 of 28 investigated behaviours, openness to experience was significantly correlated to 12, agreeableness was significantly

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correlated to 9, and neuroticism was significantly correlated to 7, while extraversion was significantly correlated only to one. With regards to demographic factors, age was significantly correlated to 16 of 28 investigated behaviours and gender was significantly correlated to 13. Therefore, it is reasonable to expect that personality traits and demographics factors may explain usage cloud storage.

Although recent research investigates many aspects of cloud computing – from adoption by organizations (Oliveira et al, 2014) to the various issues such as trust, privacy, and confidentiality (Khajeh-Hosseini, 2010) or understanding of opportunities and risks associated with cloud services (Dutta et al, 2013), there is still a need for investigating cloud computing storage services at the individual user level. Our paper fills the gap in the literature.

The research question this paper investigates is if/what five personality traits influence use of cloud storage while controlling for demographic factors.

2 DATA AND METHODOLOGY

Data were collected in December 2017 – March 2018 using an on-line questionnaire. Respondents were 478 university students (272 men, 206 women; on average 20.5 years old) from the Czech Republic. They differed also in experience from practice, 106 only study, 176 have a temporary job (brigade), 164 have a part-time job, 16 have a full time outside the field of study, and 12 have a full time within the field of study.

Personality traits were measured using John and Soto's Big Five Inventory-2 (Soto, 2017b) translated to Czech by Hřebíčková et al., 2018). Only BFI-2-XS Soto (2017a), i.e. a 15-statement version was used for this conference paper; these statements were "I am someone who..."

- ... tends to be quiet,
- ... is compassionate, has a soft heart,
- ... tends to be disorganized,
- ... worries a lot,
- ... is fascinated by art, music, or literature,
- ... is dominant, acts as a leader,
- ... is sometimes rude to others,
- ... has difficulty getting started on tasks,
- ... tends to feel depressed, blue,
- ... has little interest in abstract ideas,
- ... is full of energy,
- ... assumes the best about people,
- ... is reliable, can always be counted on,
- ... is emotionally stable, not easily upset,

... is original, comes up with new ideas on a 1-5 Likert scale where 1 meant strongly disagree and 5 stood for strongly agree. Extraversion was calculated as an average of the 1st (reversed-scored), the 6th and the 11th answer, agreeableness as an average of the 2nd, the 7th (reversed-scored) and the 12th answer, conscientiousness as an average of the 3rd (reversed-scored), the 8th (reversed-scored) and the 13th answer, neuroticism as an average of the 4th, the 9th and the 14th (reversed-scored) answer, and openness to experience as an average of the 5th, the 10th (reversed-scored) and the 15th answer.

The dependent variable was measured using the question "Do you use the following services? Cloud storage (eg Google Drive, Dropbox)". Respondents were to choose one of the following answers:

- No (coded as 0),
- Yes, sometimes (coded as 1),
- Yes, often (coded as 1).

The questionnaire contained additional questions which were not used in the analysis presented in this paper.

Logistic regression was used to analyse impact of gender, age, job type and five personality traits (extraversion, agreeableness, conscientiousness, neuroticism, openness to experience) on use versus non-use of cloud storage. A multivariate approach was used. SPSS software was used for the analysis. Although binary logistic regression module exists in SPSS, ordinal (logistic) regression module was used for practical reasons - handling of factors, i.e. of categorical variables (the binary logistic regression module has only a field for covariates, i.e. continuous variables).

3 RESULTS

The research question is if/what five personality traits influence use of cloud storage. Control variables are age, gender, and job type. Logistic regression parameter estimates for the full model are provided in Table 1.

The model per se is significant, p -value = .029, Cox and Snell pseudo R^2 is .044, Nagelkerke pseudo R^2 is .069, and McFadden pseudo R^2 is .044. Considering all variables, openness to experience and gender are significant at .05 level. Several submodels were considered. Parameter estimates for ordinal logistic regression with these two variables and age are provided in Table 2.

The model per se is significant, p -value = .001, Cox and Snell pseudo R^2 is .033, Nagelkerke pseudo R^2 is .051, and McFadden pseudo R^2 is .033.

Considering all variables, openness to experience and gender are significant at .05 level.

Table 1: Parameter estimates for the full model.

	Esti-mate	Std. Error	Wald	df	Sig.
Usage=0	.658	1.872	.124	1	.725
Age	.092	.059	2.460	1	.117
Extraversion	-.102	.146	.488	1	.485
Agreeableness	.115	.172	.446	1	.504
Consciousness	-.084	.176	.229	1	.632
Neuroticism	.030	.142	.046	1	.830
Openness to experience	.338	.152	4.920	1	.027
Male	.535	.247	4.694	1	.030
Female	0 ^a	.	.	0	.
Part-time job	-.878	1.159	.573	1	.449
Only study	-1.379	1.152	1.433	1	.231
Temporary job	-1.371	1.147	1.429	1	.232
Full-time job outside the field of study	-.849	1.379	.379	1	.538
Full-time job within the field of study	0 ^a	.	.	0	.

^a This parameter is set to zero because it is redundant.

Table 2: Parameter estimates for ordinal logistic regression.

	Esti-mate	Std. Error	Wald	df	Sig.
Usage=0	2.295	1.205	3.626	1	.057
Age	.108	.055	3.919	1	.048
Openness to experience	.351	.147	5.656	1	.017
Male	.519	.232	5.012	1	.025
Female	0 ^a	.	.	0	.

^a This parameter is set to zero because it is redundant.

4 ANALYSIS

The results suggest that use of cloud services is quite common between the young population – most respondents confirmed being users of at least one such service, quite often even more than one.

Our research has shown that there are factors that affect cloud storage use. Statistically significant are "openness to experience" and "gender". Conversely "extraversion, agreeability, conscientiousness, neuroticism" do not seem to play any role.

Such results are logically coherent as information technology and cloud services are a relatively modern thing, so primarily early adopters (people open to new experiences) are the first users of these services. Likewise, it is well known that modern digital technology has a slightly higher usage amongst men. There was no assumption that extraversion or introversion should play a role, nor for neuroticism or agreeableness there is reason to expect a correlation. In the case of conscientiousness the connection to cloud use would be possible, but was not proven.

The relevance of the results in terms of the benefits that the end user can get: the results of this research are mostly theoretical. We are aware that our findings are not that much surprising, but we are glad that we were able to provide good statistical backing to the generally shared assumption.

5 CONCLUSIONS

The aim of the paper was to investigate is whether personality traits influence use of cloud services. From the sample of Czech university students, approximately four fifths used cloud storage. This behaviour can be explained by their openness to experience.

Agreeableness was not found to be significant, though Santoso (2018) found trust to be significant, and trust is a facet of agreeableness. In general, a meta-analysis found that even constructs, which are called the same, differ in how much they influence the same dependent variable. And in this case, it could be because Santoso (2018) focused on a very specific aspect of trust.

ACKNOWLEDGEMENTS

The contribution is processed as an output of the research project by the Internal Grant Agency of University of Economics, Prague under the registration number F4/27/2019.

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