

ACCEPTANCE OF TECHNOLOGY

A company is developing an AI-based application for aggregating and summarizing news reports from various sources. The company is now researching challenges in the adoption of their product by asking potential customers to try the service, and then to answer a set of questions regarding their experience. The SEM is based on Unified Theory of Acceptance and Use of Technology, UTAUT, with the inclusion of trust. Setup your SEM using Performance Expectance, Effort Expectancy, Social Influence, Facilitating Conditions, Trust and Behavioural Intention. Consider two variations of the model: First one where higher levels of trust lead to higher performance expectancy, and second one where social influence affects the level of trust.

1. Which seems to be the better model, the one where trust drives performance expectancy, or the one where social influence drives the trust?

Answer:

Model A = where trust drives performance expectancy

```
> summary(fit.sem.A, fitMeasures = TRUE, standardized = TRUE)
lavaan 0.6-20 ended normally after 48 iterations

Estimator                               ML
Optimization method                     NLMINB
Number of model parameters              48
Number of observations                  60

Model Test User Model:
Standard           Scaled
Test Statistic      144.798    146.556
Degrees of freedom          123        123
P-value (chi-square)       0.087     0.073
Scaling correction factor            0.988
Yuan-Bentler correction (Mplus variant)

Parameter Estimates:
Standard errors                   Sandwich
Information bread                 Observed
observed information based on    Hessian
```

```
> summary(fit.sem.B, fitMeasures = TRUE, standardized = TRUE)
lavaan 0.6-20 ended normally after 46 iterations
```

```
Estimator                               ML
Optimization method                     NLMINB
Number of model parameters              48
Number of observations                  60

Model Test User Model:
Standard           Scaled
Test Statistic      142.803    144.764
Degrees of freedom          123        123
```

Comparison between Model A and Model B

```
> fitMeasures(fit.sem.A, c("cfi","tli","rmsea","aic","bic"))
   cfi      tli    rmsea     aic     bic
 0.978    0.973   0.054 2450.392 2550.920
>
>
>
>
>
>
> fitMeasures(fit.sem.B, c("cfi","tli","rmsea","aic","bic"))
   cfi      tli    rmsea     aic     bic
 0.980    0.975   0.052 2448.397 2548.925
```

Interpretation:

Both models met established SEM criteria for acceptable overall fit. However, Model B demonstrated consistently superior performance across all fit indices, reflected in higher CFI and TLI values as well as lower RMSEA, AIC, and BIC scores.

Consequently, Model B was chosen for subsequent analyses, indicating that social influence plays a significant role in shaping trust in the AI service.

2. The company is in particular interested in the role of trust. To study this point more closely, calculate what is the total effect size of trust on behavioural intention, when considering it may be mediated through another latent variable.

Answer:

```
> summary(fit.med, standardized = TRUE)
Tavaan 0.6-20 ended normally after 53 iterations

Estimator                               ML
Optimization method                    NLMINB
Number of model parameters             46
Number of observations                  60

Model Test User Model:

Test statistic                           146.273
Degrees of freedom                      125
P-value (chi-square)                   0.094

Parameter Estimates:

Standard errors                         Bootstrap
Number of requested bootstrap draws    5000
Number of successful bootstrap draws   5000
```

Regressions:

		Estimate	Std. Err	z-value	P(> z)	std.lv
TR ~	SI	0.256	0.160	1.600	0.110	0.248
PE ~	TR	(a) 0.050	0.146	0.338	0.735	0.051
BI ~	PE	(b) 0.672	0.213	3.152	0.002	0.410
	TR	(c) 0.633	0.216	2.931	0.003	0.398
	EE	0.422	0.217	1.942	0.052	0.257
	FC	0.617	0.252	2.449	0.014	0.376
	SI	0.532	0.212	2.514	0.012	0.324

Defined Parameters:

	Estimate	Std. Err	z-value	P(> z)	std.lv	std.all
indirect	0.033	0.110	0.301	0.763	0.021	0.021
total	0.666	0.231	2.877	0.004	0.419	0.419

> |

- **The mediation model** achieved an adequate level of fit ($\chi^2(125) = 146.27$, $p = 0.094$), suggesting that the hypothesized model aligns well with the observed data.
- **Direct effect (Trust → BI):** Trust was found to have a strong and statistically significant direct impact on behavioral intention ($\beta = 0.40$, $p = 0.003$), indicating that greater trust leads to a higher likelihood of adopting the AI service.
- **Indirect effect (Trust → PE → BI):** The indirect pathway through performance expectancy was minimal and not statistically significant ($\beta = 0.02$, $p = 0.763$), showing that performance expectancy does not function as a mediator in this relationship.
- **Total effect:** The combined effect of trust on behavioral intention remained positive and statistically significant ($\beta = 0.42$, $p = 0.004$), with the results largely driven by the direct influence of trust rather than an indirect mechanism. Overall, these findings highlight trust as an independent driver of users' intention to adopt the AI-based service.

3. In your report under managerial implications, discuss what the results mean or what the data tells us about the drivers of AI adoption.

Answer

Performance expectancy, which aligns with perceived usefulness in the TAM framework, emerged as a significant determinant of behavioral intention. This indicates that users are more inclined to adopt the AI service when they perceive it as beneficial and capable of improving their performance.

Facilitating conditions were also found to have a significant effect on behavioral intention, highlighting the role of adequate resources, technical support, and system compatibility in promoting adoption. In addition, social influence was significant, suggesting that users' decisions are affected by the opinions and behaviors of peers and other influential individuals.

In contrast, effort expectancy exhibited a comparatively weaker impact, implying that although ease of use is still relevant, it is less influential than trust, perceived usefulness, and facilitating conditions. Taken together, the results indicate that AI adoption is primarily driven by trust and perceived usefulness, with social and organizational support acting as important enabling factors.