

EMPLOYEE IT SATISFACTION LATENT FACTORS EVALUATION USING TECHNOLOGY ACCEPTANCE MODEL IN MANDATORY

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Abstract

Client facing employees are key in business success, especially in mandatory Information Systems environments like financial institutions. Therefore, understanding “how” specific technology serves the purpose is critical in taking the right decisions or change management. This paper evaluates the influences of various Information Systems constructs with Technology Acceptance Model along with confirmation bias, by use of structural equation modelling. The research was done of a financial institution and used a survey instrument with 596 employees with various client facing roles. This study shows not only the relevancy of the perceptual TAM constructs but also importance of other organizational capabilities in a mandatory environment. We explained the “Why” of opinions and “How” behind the job user experience and employee satisfaction using elements from Attribution Theory as confirmation bias. Model hypothesis were validated and model parameters are used for improving the status, as well as evaluating potential impact using structural equation.

Keywords

job user experience, employee satisfaction, technology acceptance model, user experience, banking, employee motivation, structural equation modeling.

JEL Classification

O15, O33, C12, C83, O 32, O31

Introduction

Mandatory environments (Venkatesh and Davis, 2000; Hwang, Al-Arabi and Shin, 2015), imposes a specific workplace to employees, with restrictions and specific requirements. Typically banks, through employees or alternate channels (Sarkar, 2009) provides a wide range of services (Abdullah et al., 2014) including mobile services (Singh, Srivastava and Srivastava, 2010; Luarn and Lin, 2005). Thus, employees need to use a series of information systems to provide services to external customers and feels empowered (Schneider and Bowen, 1985; Sowmya and Panchanatham, 2011; Sekhar, Patwardhan and Singh, 2013) or supported (Eisenberger, Cummings, Armeli and Lynch, 1997) – receiving an expected level of organizational support. This paper looks for additional insights from

integrating elements from causal attribution with Information Systems perception for task fulfilment and job satisfaction.

1. Literature review and methodology

To evaluate how individuals decides to use or interacts with Information Systems, many studies used Technology Acceptance Model, also mentioned as TAM, to investigate how technology and environmental factors leads to technology adoption and usage. Other earlier theories as Information Diffusion theory or Innovation adoptions were reviewed over time (Rogers, 1995). Literature is abundant in critical reviews (Marangunić and Granić, 2015) that presents various TAM model validation techniques or approaches in multiple empirical studies, as a benefit of its versatility. Criticism was brought to attention also (Lee, Kozar and Larsen, 2003) about model limitations (Schepers and Wetzels, 2007). Original TAM model (Davis, 1986; Davis, Bagozzi and Warshaw, 1989;) originated from two psychology related theories: Theory of Reasoned Actions – TRA and Theory of Perceived Behavior - TPB (Ajzen, 1991; Madden, Ellen and Ajzen, 1992; Marangunić and Granić, 2015). Original model evolved over years (Chuttur, 2009). TAM is based on influence of two main constructs – Perceived Usefulness and Perceived Easy of Use. For the purpose of this paperwe consider the original model (Davis, 1986) enhanced with element introduced by conformation bias reflected as trust in organizational support from Causal Attribution Theory (Kelley, 1973; Puccinelli et al., 2009). TAM constructs evaluate and predicts the behavior by use of perception of specific attributes that fits into categories of perceived utilitarian dimension and accessibility. Davis (1986) evaluates a significant positive relationship from perception constructs towards attitudinal and behavioral intention to use. However, in mandatory, regulated environments as cited earlier the influence over behavior is limited, more reflecting in a series of inner states related to evaluation of perceived value and perceived capabilities. Cognitive dissonance theory (Festinger, 1957; Cooper, 2012) explains the mechanics off attitudinal change as a result of behavior as a way to overcome a cognitive discomfort (Elliot and Devine, 1994), as mediating action (Petty, Wegener and Fabrigar, 1997). Attribution theory (Kelley, 1973) presents the way that individual deals and accept a series of facts and selects information to confirm their already formed beliefs, in order to be in agreement with their inner feelings and a form of motivated reasoning (Kunda, 1990; Oswald and Grosjean, 2004).The model we proposed is synthetized in (Figure no. 1).

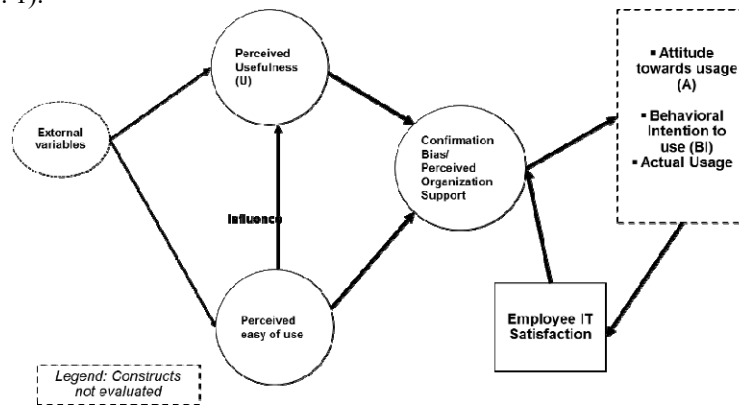


Figure no. 1: The designed model based on the TAM model

The following hypothesis were created:

H1: Latent Perceived Usefulness (U) is contributing to the confirmation bias. In the proposed model, we removed the implication of perception against attitudinal and behavioral intention from TAM. Granting causal attribution theory on how people make causal attribution, originating from social psychology. It is no argue that survey instruments, designed to capture relevant data will call the cognitive processes related to mixture of positive and negative perceptions, thus making reasonable to assume that the Rating measurement has a direct mediating effect of elements of confirmation bias (Kelley, 1973). It is valid to assume this, as we are collecting data that activates concerns and areas well perceived as understood. While theory of cognitive dissonance could contribute on attitudinal and behavioral relationships (Festinger, 1957; Cooper, 2012), we consider for this study only the causal attribution.

H2: Latent Perceived Easy of Use (E) is contributing to the confirmation bias. That originates also from initial TAM Model (Davis, Bagozzi and Warshaw, 1989) and the statements for H1 remains valid, while perceived benefits are not the main driver.

H3: Perceived accessibility E is influencing perceived Utility U. TAM original hypothesis.

H4: Confirmation bias reflects non-TAM organizational support. Confirmation bias construct while dependent on perception constructs is influencing the awarded measurement for the IT satisfaction related to job environment (Wright and Staw, 1999). While theory is very broad, for the paper we consider elements specific to organizational support. We already mentioned the implications of mandatory environments, as well as studies on employee trust and expectation of organizational support. During qualitative research, that was obvious so we included this element related to overall Support – Helpdesk and trust that Organization will act (Judge, Thoresen, Bono and Patton, 2001) based on their opinions (Oswald and Grosjean, 2004). Confirmation dimension was also evaluated in other TAM subsequent models with different approach from expectancy confirmation theory (Bhattacharjee, 2001).

Methodology: This study used a target population of 3500 employees out of 6000 total employees. A qualitative exploratory research was conducted, using specific techniques (Weigand, 2006) by conducting semi structured interviews for 30 individuals that supported construction of the conceptual model. That was the base for adapting TAM and confirmation bias constructs. Manual coding and indexing based on interview transcripts was performed. The survey instrument was based on electronic questionnaire using Likert scale with midpoint and 7 points, open-ended questions or categorical choice based responses, with a validated participation of 596 respondents. Quantitative modeling was performed using SPSS Statistics package and SPSS AMOS. The dataset was analyzed using descriptive statistics tests and processed using Structural equation Modeling- SEM (Suhr, 2006; Hooper, Coughlan and Mullen, 2008). SEM is considered a good modeling technique for confirmatory analysis or for measuring influence of latent factors, that cannot be measured directly, also called unobserved variables. The evaluation of result (Bollen and Pearl, 2013) took into account both statistical validity validation but also alignment to the theory and previous research in the field.

2. Results

Variables were tested for validity and reliability. Out of 596 valid responses we looked for reliability test using Cronbach 's Alpha index (0.893) that has a good value comparing to 0.7. The number of values was 19, all relevant to the case. Cronbach's Alpha if Item

Deleted Index pointed out that there is no significant value taking variables out of analysis, as no larger value than (0.893) identified, but pointed that variable z32.ActionableInsightValuesMe is important to look for (0.892). Frequency table for all variables gives acceptable data for skewness (between -1.3 and 0.9 values) and kurtosis (-1.4 and 1.5) but being between acceptable [-2/2] range (Trochim and Donnelly, 2006). Because SEM requires validation of no missing data, all case that had missing values were checked for exclusion from analysis. The Mean, Mode and Median gives initial indication on sample responses and suggest that respondents were engaged during response.

Inter-item correlation matrix gave initial evaluation of association between concepts with a maximum value of (0.785) and a minimum of (0.016), a mean of (0.305). Close to dataset maximal correlation pairs was identified between (5.AppFlow and 4.UILayout, value of 0.723), (z6.CrashFreeandz3.AppSpeed, 0.627), (z3.AppSpeedand 2.NetSpeed of0.785) suggesting that while covering close perception, employees are able to distinguish between the main cause of problems, as most of the statements balanced between negative and positive statements. Interesting pairs as (z6.CrashFree and 9.WorkstationHW , BANK-IT-Rating,2.NetSpeed orz3.AppSpeed registered close values between 0.4 and 0.627) indicates still an interesting latent variables influence , related to out tested capabilities, all originating from TAM constructs. Confirmation Bias specific variables as z32.ActionableInsightValuesMe recorded a maximal inter-item correlation of 0.376 withBANK-IT-Rating and 0.234 forz32.ActionableInsightValuesMe). A factor Analysis performed in SPSS Statistics shows that indeed there is grouping in the data that fits the theoretical assumptions, with 3 potential factors out of 5 explaining more than 35% of total Variance in Initial Eigenvalues.

The evaluated SEM restricted model explains and validates initial hypothesis as well as confirms initial assumptions on latent factors. (Figure no. 2)

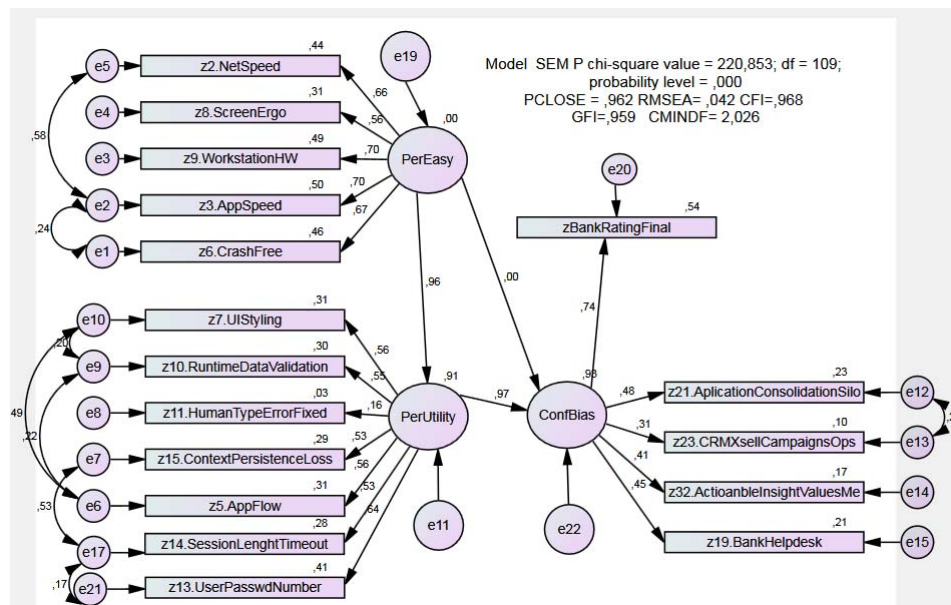


Figure no. 2: Restricted SEM Model, standardized estimates

According to SEM Model evaluations (IBM SPSS Amos, 2012), we looked for indexes as GFI, CFI, CMIN/ DF and RMSEA – indices explained below. Model has three unobserved variables (PerEasy, PerUtility, ConfBias) and evaluation of strength of explanation is presented by values on arrow. We considered residual errors for all measurements, and correlation between residual. We tried to avoid correlation explicit between residuals associated to different variables, even if model improvement suggests it – but with relative small gain, by use of Modification Indices in AMOS. This is also a good evaluation of potential model improvements. Model had 109 degrees of freedom (DF) and a good accepted CMIN/DF ratio – we looked for values below 3, while <5 is still acceptable. Model validity was also evaluated against theoretical assumptions, as SEM is used in explaining how overall perceptual processes are reflected in a specific set of measurements. Confirmation Bias factor (ConfBias) included 4 observed variables including Z21 and Z23 as it was reflected during the exploratory research that there is a strong belief that bank will consolidate a series of application and CRM will change fundamentally their way of working. Values of correlations between residuals are represented on the double arrow. Largest values, also evaluated in our initial factor analysis are not surprise ($e2 \leftrightarrow e5$ 0.585) and ($e7 \leftrightarrow e17$ 0.535) teaching that easy of use dimension without utilitarian aspect has limited perceived value. Special consideration was done, modifying model to suggest that utilitarian perception in the end will better reflect in the decision process (forced ConfBias \leftarrow PerEasy regression weight Estimate to value of 0), so This regression weight was fixed at 0.000, not estimated). Correlation between residuals in Confirmation bias ($e12 \leftrightarrow e13$, correlation Estimate 0.204) shows that two initial evaluated separate findings could be associated within residuals and part of casual attribution. Regression weight tables confirmed that p values are significant. Alternate model (Figure no. 2) was evaluated with 108 degrees of freedom, by eliminating the 0 weight between ConfBias \leftarrow PerEasy, giving the following results that are convergent with the first one- we see slight modifications in weight propagated, but aligned with hypothesis H1, H2, H3, H4, with the following estimates (PerUtility \leftarrow PerEasy, Estimate 0.941; ConfBias \leftarrow PerUtility, Estimate 0.638; ConfBias \leftarrow PerEasy, Estimate 0.329). Model is valid, with no further modification indices signaling other exclusions.

An exploratory initial Model (diagram not included) between (Estimate PerUtility \leftarrow PerEasy, Estimate 0.929) was evaluated during exploratory analysis with same H3 validation, meaning that when PerEasy goes up by 1 standard deviation, PerUtility goes up by 0.929 in standard deviations, with a CMINDF rate of 2.802 -for the Default model, the discrepancy divided by degrees of freedom is $67.245 / 24 = 2.802$. Evaluation of Model Fit Indices followed the general accepted evaluation rules (Bentler and Yuan, 1999) and potential choices of evaluation (Marsh, Hau and Wen, 2004): GFI >0.9 (The GFI (goodness of fit index); CFI >0.9 (comparative fit index); RMSEA <0.1 (root mean square error of approximation); PCCLOSE >0.5 (Under the hypothesis of "close fit" (i.e., that RMSEA is no greater than .05 in the population), the probability of getting a sample RMSEA as large as RMSEA is PCCLOSE). (Figure no. 3)

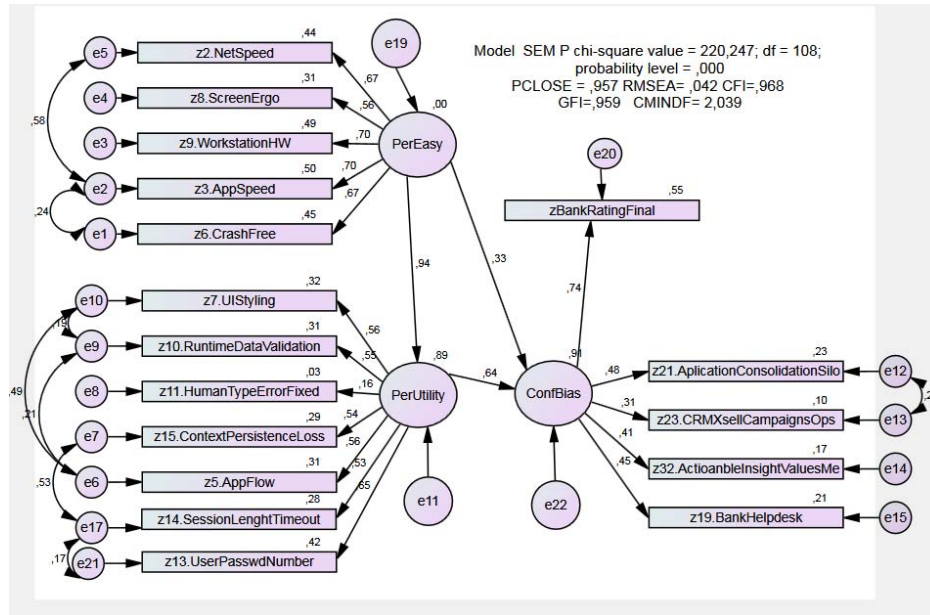


Figure no. 3: Final SEM Model, standardized estimates

Conclusions

The current study evaluated general theoretical aspects derived from TAM and Causal attribution theory, trying to explain how employee’s satisfaction and perception is potentially influenced by non-product or technology related functions, but rather cognitive processes derived from psychology research. That approach was confirmed by empirical evidences documented in this study and shows clear validation of hypothesis and the strength of association of the relationships. While model validity was followed, tight alignment with theory was also looked.in mandatory complex environments we can draw the conclusion that organizational support is equally important, as well as features and functions, that becomes less relevant in complex, interconnected environments, that shares or duplicates potentially functions. The qualitative research served as a strong starting point for understanding individual and organizational perspective, as well explaining a series of associations that employees were constantly addressing. The practical applicability of this approach is high due its value in explaining more than measurements related to functionalities but rather to evaluate the change management from this perspective. Future research should focus on other areas as analyzing more opinions for model improvement. Another applicability resides in evaluating the Net Promoter Score for customers, by understanding the perception of Brand and CSR as potential mediator factors over the customer experience (Kim, Hur and Yeo, 2015) or consumer perception driven research. Empirical validation of TAM hypothesis within this paper show the relevancy of this theoretical approach.

References

- Abdullah, M.A., Manaf, N.H.A., Owolabi Yusuf, M.-B., Ahsan, K. and Azam, S.M.F., 2014. Determinants of Customer Satisfaction on Retail Banks in New Zealand: An Empirical Analysis Using Structural Equation Modeling. *Global Economy and Finance Journal*, 7(1), pp.63–82.
- Ajzen, I., 1991. The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50(2), pp. 179-211
- Bentler, P. and Yuan, K.-H., 1999. Structural Equation Modeling with Small Samples: Test Statistics. *Multivariate Behavioral Research*, 34(2), pp.181–197.
- Bhattacharjee, A., 2001. Understanding Information Systems Continuance: An Expectation Confirmation Model. *MIS quarterly*, 25(3), pp.351–370.
- Bollen, K. and Pearl, J., 2013. Eight Myths About Causality and Structural Equation Models*. *Technical Report R*, 15, pp.301–328.
- Byrne, B.M., 2010. *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. s.l: Routledge.
- Chuttur, M., 2009. Overview of the Technology Acceptance Model: Origins , Developments and Future Directions. *Sprouts: Working Papers on Information Systems*, 9, pp.1–23.
- Cooper, J., 2012. Cognitive dissonance theory. In: P.A.M. Van Lange, A.W. Kruglanski and E.T. Higgins eds., 2012. *Handbook of theories of social psychology*. London: SAGE, pp.377–397.
- Davis, F.D., 1986. *A technology acceptance model for empirically testing new end-user information systems: theory and results*. Management Science. PhD. MIT.
- Davis, F.D., Bagozzi, R. and Warshaw, P., 1989. User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, 35, pp.181–192.
- Eisenberger, R., Cummings, J., Armeli, S. and Lynch, P., 1997. Perceived organizational support, discretionary treatment, and job satisfaction. *The Journal of applied psychology*, 82(5), pp.812–820.
- Elliot, A.J. and Devine, P.G., 1994. On the motivational nature of cognitive dissonance: Dissonance as psychological discomfort. *Journal of Personality and Social Psychology*, 67(3), pp.382–394.
- Festinger, L., 1957. *A theory of cognitive dissonance*. Stanford: Stanford University Press.
- Hooper, D., Coughlan, J. and Mullen, M.R., 2008. Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods*, 6(1), pp.53–60.
- Hwang, Y., Al-Arabi, M. and Shin, D.-H., 2015. Understanding technology acceptance in a mandatory environment: A literature review. *Information Development*, 31(3), pp.1–18.
- IBM SPSS Amos, 2012. IBM SPSS Amos. *IBM Software Business Analytics*, YTD03114-U, pp.1–8.
- Judge, T.A., Thoresen, C.J., Bono, J.E. and Patton, G.K., 2001. The Job Satisfaction-Job Performance Relationship: A Qualitative and Quantitative Review. *Psychological*

- Bulletin*, 127(3), pp.376–407.
- Kelley, H.H., 1973. The process of causal attribution. *American Psychologist*, 28(2), pp.107–128.
- Kim, H., Hur, W.M. and Yeo, J., 2015. Corporate brand trust as a mediator in the relationship between consumer perception of CSR, corporate hypocrisy, and corporate reputation. *Sustainability (Switzerland)*, 7(4), pp.3683–3694.
- Kunda, Z., 1990. The case for motivated reasoning. *Psychological Bulletin*, 108(3), pp.480–498.
- Lee, Y., Kozar, K. and Larsen, K., 2003. The technology acceptance model: past, present, and future. *Communications of the Association for Information System*, 12(50), pp.752–780.
- Legris, P., Ingham, J. and Colletette, P., 2003. Why do people use information technology? A critical review of the technology acceptance model. *Information & Management*, 40(3), pp.191–204.
- Luarn, P. and Lin, H.-H., 2005. Toward an understanding of the behavioral intention to use mobile banking. *Computers in Human Behavior*, 21(6), pp.873–891.
- Madden, T.J., Ellen, P.S. and Ajzen, I., 1992. A Comparison of the Theory of Planned Behavior and the Theory of Reasoned Action. *Personality and Social Psychology Bulletin*, 18(1), pp.3–9.
- Marangunić, N. and Granić, A., 2015. Technology acceptance model: a literature review from 1986 to 2013. *Universal Access in the Information Society*, 14(1), pp.81–95.
- Marsh, H.W., Hau, K.-T. and Wen, Z., 2004. In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling-a Multidisciplinary Journal*, 11(3), pp.320–341.
- Oswald, M.E. and Grosjean, S., 2004. Confirmation bias. In: F.P. Rudinger ed., 2005. *Cognitive Illusions: A Handbook on Fallacies and Biases in Thinking, Judgement and Memory*. s.l: Psychology Press, pp.79–96.
- Petty, R.E., Wegener, D.T. and Fabrigar, L.R., 1997. Attitudes and Attitude Change. *Annu. Rev. Psychol*, 48, pp.609–47.
- Puccinelli, N.M., Goodstein, R.C., Grewal, D., Price, R., Raghurir, P. and Stewart, D., 2009. Customer Experience Management in Retailing: Understanding the Buying Process. *Journal of Retailing*, 85(1), pp.15–30.
- Rogers, E.M., 1995. *Diffusion of innovations*. s.l: Macmillian Publishing Co.
- Sarkar, S., 2009. Employee Empowerment in the Banking Sector. *IUP Journal of Management Research*, 8(9), pp.48–66.
- Schepers, J. and Wetzels, M., 2007. A meta-analysis of the technology acceptance model: Investigating subjective norm and moderation effects. *Information and Management*, 44(1), pp.90–103.
- Schneider, B. and Bowen, D.E., 1985. Employee and Customer Perceptions of Service in Banks: Replication and Extension. *Journal of Applied Psychologist*, 70(3), pp.423–433.
- Sekhar, C., Patwardhan, M. and Singh, R.K., 2013. A literature review on motivation. *Global Business Perspectives*, 1(4), pp.471–487.

- Singh, S., Srivastava, V. and Srivastava, R.K., 2010. Customer Acceptance of Mobile Banking: A Conceptual Framework. *SIES Journal of Management*, 7(1), pp.55–64.
- Sowmya, K.R. and Panchanatham, N., 2011. Factors influencing job satisfaction of banking sector employees in Chennai, India. *Journal of Law and Conflict Resolution*, 3(5), pp.76–79.
- Suhr, D., 2006. The basics of structural equation modeling. [online] Available at: <<http://www.lexjansen.com/wuss/2006/tutorials/TUT-Suhr.pdf>> [Accessed 2 February 2017].
- Trochim, W.M.K. and Donnelly, J.P., 2006. *The Research Methods Knowledge Base*. 3rd ed. s.l: Atomic Dog.
- Venkatesh, V. and Davis, 2000. A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46(2), pp.186–204.
- Weigand, H., 2006. methodology Theory / practice oriented Research quadrant. *The Sciences*, pp.1–7.
- Wright, T.A. and Staw, B.M., 1999. Affect and favourable work outcomes: two longitudinal tests of the happy - productive worker thesis. *Journal of Organizational Behavior*, 20(1), pp. 1-23.