Chapter 10
The Validation Process for Tier–III Variables and Fitness of the Model

ABSTRACT

The validation of the model is dependent on the strength of the relationships established through variables, and Tier-III influencers are designed to ensure the validation process at a macro level. Tier-III influencers of the model help us understand the relations between variables matching (fitting) the data (Tier-I and II) and the way they influence the appropriateness of the model. Tier-III influencers characterize theoretical testing of the model and are mostly based on theory-driven search for the important antecedents of one or more focal variables. Tier-III influencers help us understand the relationship among the variables governing the outcome of the proposed model. It is agreed that the process of testing or validating theoretical models with survey data is addressed by first determining the adequacy of the measures of the unobserved variables in the model and then determining the reasonableness or adequacy of the hypothesized model. Measurements of Tier-III use conceptual definitions of the unobserved or latent variables, along with observed variables or items that measure these unobserved or latent variables. This chapter discusses model-to-data fit and parameter estimates by utilizing structural equation analysis. Model adequacy is determined by using hypotheses and model-to-data fit and parameter estimates from structural models.

VALIDATIONS OF TIER-III VARIABLES

For theoretical model testing researchers tend to agree that specifying and testing models using unobserved variables with multiple item measures of these unobserved variables and survey data involve: *1*) defining model Variable, *2*) stating relationships among these variables, *3*) developing appropriate measures of these variables, *4*) gathering data using these measures, *5*) validating these measures, and *6*) validating the model (i.e., testing the stated relationships among the variables) (Bollen, 1991).

As shown in Figure 1 (reproduced from chapter six), Tier-I variables are examined for their applicability to predict the respective independent variables through summative nature of these items

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(Nunnally, 1978) as explained in detail in Chapter 8. Tier-II variables representing independent variables are tested through hypotheses formulated for its predictability as discussed in Chapter 9. It is seen that these independent variables, otherwise termed as observed variables measured through the items of the questionnaire have collectively predicted its summated Tier-II variables. Tier-III variables are the unobserved variables ("latent variables") of the model. These Tier-III variables are tested and validated for their relationships in order to measure the overall fitness of the model. Besides discussing the application of Structural Equation Modelling (SEM) principles for the proposed model, its overall fitness is also tested in this chapter.

The relationship is generated through structural equation modelling. Application of structural equation modelling provides the relationship through two types of equations i.e. measurement equations and structural equations (Pedhazure, 1997). It brings the advantages over multiple regressions because of its flexibility to predict the validity of model in the face of multi-colinearity; and use of Confirmatory Factor Analysis (CFA) to reduce measurement error. SEM techniques incorporate and integrate path analysis and factor analysis. Besides, as SEM supports "causal thinking", it prepares correlation matrix and covariance matrix for analyses as desired for understanding the "goodness-of-fit" of the model. SEM tries to address some limitations/ shortcomings experienced in multiple regressions. First, multiple regression assumes "one dependent variable" though there could be a number of "predictors". Second, multiple regressions do not use a dependent variable as a predictor for the next stage which is rather a reality in most of the problem statements. Third, measurement of error for dependent variables in regression analysis is mostly ignored. Latent variables are difficult to measure or predict and therefore, would normally lead to having error in measuring these.

"Pre-acquisition process preparedness (P)", "Climate preparedness (C)", "Organisation preparedness (O)", "Acquisition Process (AQ)" and "IT Acquisition Success (G)" are difficult to measure and therefore, are considered as latent variables which are prone to have measurement errors.

Figure 1. Variables used for the model