Chapter 11
Application of the Model:
Case-Based Studies

ABSTRACT

It is argued that models are conceptualized, designed, developed, and validated to understand complex behaviour of larger entities. Models provide indicative measurements, and their validations in real life situation need careful considerations of relevant ambient conditions. Models also provide suggestive and causal relationships among their qualitative and quantitative influencers for better predictability. Generally, predictive models provide structural equations, measurement equations with associated random errors. These errors do play vital roles in relating abstracted behavior of the model outputs with the real life situations. In order to reduce these errors to an agreed level, case-based validations of models are quite important. This chapter discusses derived measurement and structural equations that the model has produced and presents some cases to examine the appropriateness of the application of the model developed.

DERIVED MEASUREMENT EQUATIONS OF THE MODEL

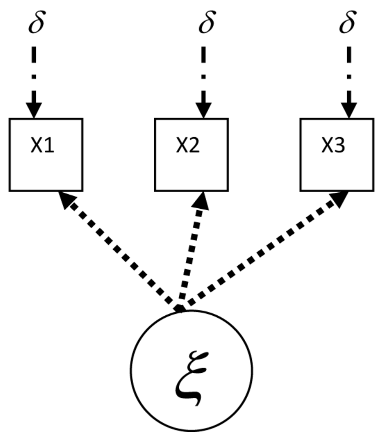
Measurement equations show the relationships among latent and exogenous variables. "Classical test theory" is the basis for establishing this relationship (Cronbach et al., 1972; Linn and Werts, 1979; Susan et al., 2008; España et al., 2010). The general form of the measurement equation is shown in Figure 1.

The measurement equation here is $X = \xi + \delta$ where X is the exogenous variables which is the mean of the items summated through dummy coding as explained in chapters eight and nine. ξ represents the endogenous variable in the equation. Each variable X thus represents a set of independent indicators (questions) administered to the respondents and ordinal data are acquired. Classical test theory considers measurement errors (δ) and provides a predictive ability to the relationship between exogenous variable and predictors. Table 1 describes the relationships and displays the foundation for such predictions.

This table provides set of questions for each of the variables. Its values are obtained from the survey instruments administered among the respondents. Using these data the values of the predicted latent exogenous variables were com-

DOI: 10.4018/978-1-4666-4201-0.ch011

Figure 1. Measurement equation (SEM) (España et al., 2010)



puted through measurement equations shown in the Table 1. The variable "X" with its measurement errors is obtained for each respondent for each variable and its mean across the variables in each category is computed for analysis. Table 1 indicates that latent exogenous variables U, I, T compute latent endogenous variables (ξ) P. Similarly, C1, C2, C3 variables compute C and VC, AT variables compute AQ. These variables are computed based on the summative nature of the structural equation model (Pedhazur, 1997). For example, in order to compute pre-acquisition preparedness (P), $P_{U,}$ P_I, P_T are computed for the

Table 1. Measurement equation

Stratified Independent Indicators *Questions*	**Dummy Codes Used** $\overline{Item}$	**Summated Independent Indicator** $\overline{Variable}$ **X**	**Description of Exogenous Variable X**	**Latent Endogenous Variables** ξ	**Measurement Equation (Classical Test Theory) ($X = \xi + \delta$)**
U101-U106	U1	U	User Preparedness	P Pre-Acquisition Preparedness	$U = P_U + \delta$ $I = P_I + \delta$ $T = P_T + \delta$ $(P_{mean}) = \frac{Pu+Pi+Pt}{3}$
U201-U207	U2				
U301-U307	U3				
I101-I106	I1	I	IS Preparedness		
I201-I204	I2				
I301-I306	I3				
T101-T107	T1	T	Technology Preparedness		
T201-T209	T2				
T301-T307	T3				
C101-C108	C1	C1	User Perception on Organization	C Climate Preparedness	$C1 = Cc_1 + \delta$ $C2 = C\,c_2 + \delta$ $C\,3 = Cc_3 + \delta$ $(C_{mean}) = \frac{Cc1+Cc2+Cc3}{3}$
C201-C207	C2	C2	User Perception on IT		
C301-C307	C3	C3	User Perception on Decision Making Process		
VC01-VC06	VC	VC	Vendor Management	AQ Acquisition Process	$VC = AQ + \delta$ $AT = AQ + \delta$ $(AQ_{mean}) = \frac{AQvc+AQat}{2}$
AT01-A06	AT	AT	Acquisition Process		