

DATA MANAGEMENT AND PATTERN-MAKING FOR A INSTITUTIONAL STRATEGIC PLAN

by
Lucian Marina, Florea Voiculescu

Abstract: Institutional strategic plans are absolutely necessary instruments in quality management. Their functions are those of diagnose and forecast for the material, financial and human waves, also by qualitative point of view and quantitative one. The cybernetic way in the question of institutional plan involves the consideration of two close processes: data management and pattern-making. Taking a concrete example, the institutional strategic plan of “1 Decembrie 1918” University, the author suggests a dynamic solution, very close with cybernetic visions, by integrated utilization of two softs of maximum impact in the socioeconomic scientific research world: SPSS and LIREL. The application can do the search of some points of equilibrium between quantitative and qualitative institution development.

1. DATA MANAGEMENT

Data management is possible using databases. Databases are, concerning SPSS interface that we use in management, information about each statistic unit from institutional strategic plan, structured using double input tables.

Data management from institutional strategic plan involves operations with material, financial and humane data, viewed in their quantitative dimensions, as in qualitative one. E.g., we can consider as didactic flow not just the teachers, lecturers or assistants for each specializations (quantitative variables), but also the type of the didactic and researchable activities made by these (qualitative variables).



	prof_hr	conf_hr	lect_hr	asis_hr
1	5	3	10	6
2	8	2	15	7
3	2	2	10	3

	lect_a1	lect_a2	lect_a3
1	conferinta AEG	cercetare DOCT	didactic HIGH
2	simpozion TEC	cercetare LAB	didactic MED
3	atelier SET	cercetare TEHN	didactic HIGH

Figure 1: Quantitative and qualitative management of the didactic personal flow

Data management with SPSS will concern some primer syntaxes, as:

- Variable identification (they can be thought as variable sets) on those three flows: material, financial and human.

- Cases identification: can be made transversal on the specializations, chairs and longitudinal on the calendar years, study years and university years.
- Files standardization and those adequate name: the standardization is offered by the structure of the institutional plan, and files name must concern the following information:
 - The type of the management flow (material, financial and human)
 - The type of the stored data (quantitative and qualitative)
 - How are the cases identified (longitudinal or transversal)
 - To which chapter or subchapter from the institutional strategic plan the files fits
 - Which purpose the title serves: it is only for management, unchangeable or it is analysis file, changeable.

Complex syntaxes of data management using SPSS contain: recoding the variables, creating a new variable, with Compute, creating a new variable using If, creating the unsetting data using Select Cases, and the weight procedure of the cases with Weight Cases. Let's analyze all these syntaxes one by one.

Variables recoding, which is a combination way for the values of the variables (variables values) into a less and less categories? For instance, age variable, which is able to manage in the strategic plan the didactic titular staff age.

“Year registration of the actual age is a simple way of working with the data. But, another request also can be more useful if they will be organized in precise unconfused categories, like “young”, “middle aged”, “old aged”. Using SPSS soft for Windows will succeed to reorganize the data and those three clusters. Previously, recoding variable values we have to “age” another two operations: first, we have to decide which is the number of the variable categories, useful in our work. Generally speaking, this number is determined by the way the information will be used using the new variable. If the new variable will be introduced into a contingency table with two variables, the number of the categories must be situated between three and four, but depending on the concrete nature of the research we can choose also for two categories, or if our sampling is bulky [...] we can also operate with a number of categories bigger than four. Second, we should decide in which way the old variables values could be recombined into a new category”.

[L., Marina, V. Millea, M. Rîșteiu, C. Filipescu. *Advanced analysis techniques in social sciences*, vol. 2, Aeternitas, Alba-Iulia, 2003, p. 111]

Date's recoding for an institutional strategic plan fits to an annual analysis necessity, which belongs to the institution or to a possible relate, requested for example by Education, Research and Youth Ministry. Using the recoding way, the primary information becomes complex information. Also, the qualitative data could be easily transformed into quantitative data. Following the example from figure 1, all the activities made by the teachers, could be quantitative recoded by the “Recode –

Recode into Different Variables” command; beforehand, the “string” data were transformed in numerical data.

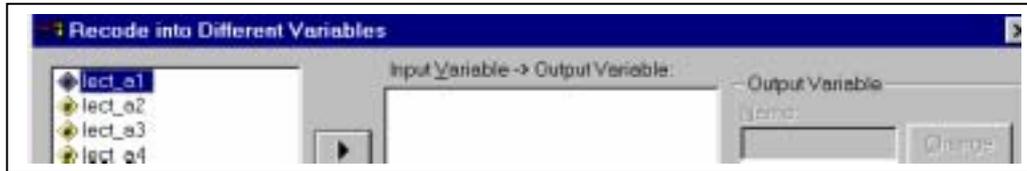


Figure 2: Recoding the data of the institutional strategic plan

Creating a new variable with Compute syntax has as a goal the combination of primary data (by using simple and complex arithmetical operations) in order to obtain a new variable capable to render all condensed information, take for example the information referring for all the extra didactic activities which are realized or have to be realized by a teacher category.

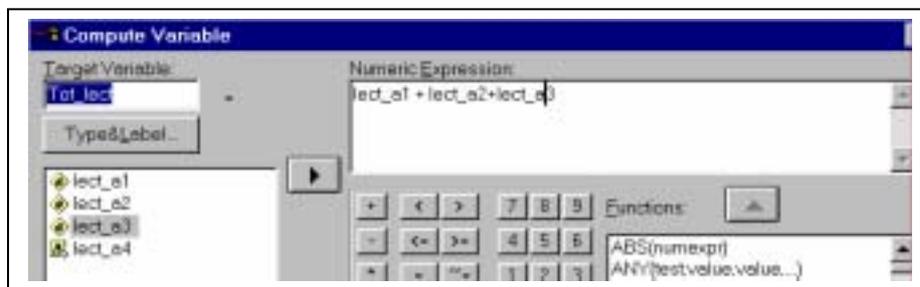


Figure 3: Creating a new synthetic variable using the command Compute for the extra didactic activities of the lectures

If command from Compute syntax is another way to create new variables, starting the process from the old variables. This command is, unlike the main syntaxes Compute, a way to create a new variable step by step and allows the conditioning on cases, which will be selected by the analysis. Coming back to our example, we will introduce the condition “let’s select only the cases in which the lectures participated to national and international conferences.

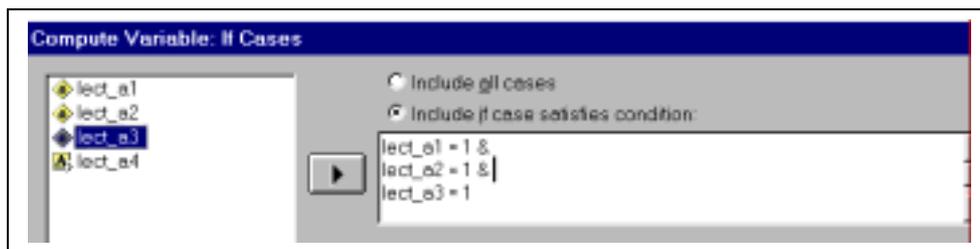


Figure 4: Creating a new synthetic restrictive variable for the activities extra didactic activities of the lectures

Creating data subsets by using Select Cases syntax has as a goal the complex analysis for some cases from SPSS file with .sav extension. All statistical analysis operations and all the presentation by graphic form could be realized only for conditioned cases. We may use the simple command, “If condition is satisfied”, but we are allowed to use also other conditionings:

1. “Random sample of cases” is used especially in order to ponder the cases, when we want to exclude certain proportion of cases from .sav file at random.
2. “Based on time or case range” is used in order to exclude fast some cases from databases, for example from the specialization case of Informatică to Sociologie specialization case.
3. “Use filter variable Are” will exclude from databases the cases with “0” values for numerical variable which is indicated in the window (this window will be accessed by selecting this option).

The last management complex syntax is Weight Cases used in the situations when some cases from databases must have another “Weight, comparing with others. For example, if we want to get an analysis of hour’s practice work, integrated in educational plans for each specialization, an analysis of the judicious planning of the hour number, in accordance with the specific of each specialization we will have to give weights to the cases-specializations depending on the magnitude of the practice in student’s training. Thus, a multiplication number which allows us to compare directly the specializations between them will be used.

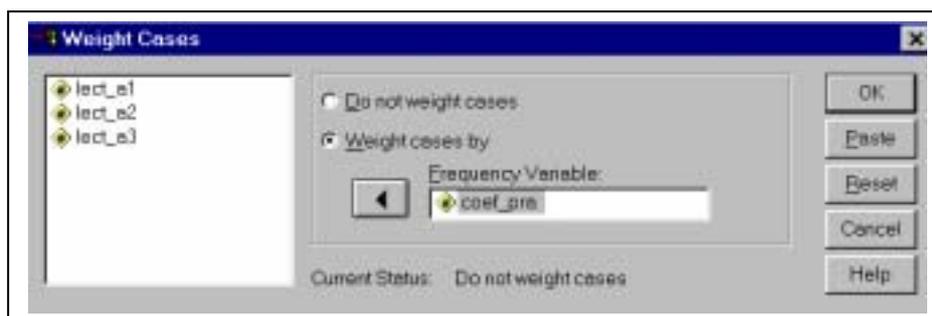


Figure 5: Hours practice weight from the educational plans after a multiplication coefficient

2. DATA MODELLING

Data management from the institutional strategic plan can answer to each necessities of reporting, requested by the institution and, also, it is able to offer dynamical images of material, financial and human flows of the institution, which are necessary for relevant diagnosis and forecasts. But, the entire management process is specific for the aspects surprised in the strategic plan; in this case, to get a general image about those three flows it is necessary to contact the analysis pattern more complexly. The authors sustain that is necessary to model the institutional data using the product Lisrel 8.

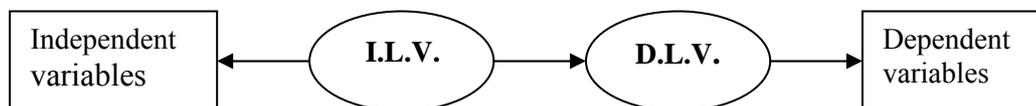
The Lisrel 8, that some authors suggest, is one with latent variables. Detail explication of the path's patterns with latent variables and detail explication about data *Prelis* interpretation can be found at Joreskog and Sorbon (1993), and numerous examples are at Dumitru Sandu (1996a, 1999).

The model is organized on four variable categories:

- Indicator independent variables
- Latent independent variables
- Dependent latent variables
- Dependent variables

Indicator independent variables are those which are involved, as indicators, in order to define the independent latent variables. Independent latent variables determine the variations of dependent latent variables, and those explain, at their time, the variations of the dependent variables.

Synthetically, the design of the model Lisrel is this one:



The researcher must propose, following the regressive systematical analysis or progressive systematical analysis, the appropriate relations between variables and even to maintain, in a theoretical way, the proposed model.

Lisrel Model will become a functional one for the institutional strategic plan's practice, by using standardized and nonstandardized partial regression coefficients.

Here comes a "Lisrel" model, created for the doctorate thesis (Marina, 2003), useful for the work style understanding with Lisrel. Do not forget, that SPSS files, created and transformed in management's practice, will represent the entry data for "Lisrel" patterns.

The numbers situated on the circle's arcs represent the partial regression coefficients (nonstandardized), which are used for testing of the absolute influence of any variable, under the conditions that other variables are maintained on a constant level.

The standardized coefficients are useful in order to determine the relative importance of any variables (the influence of the variable's measure unit is considerably lessened).

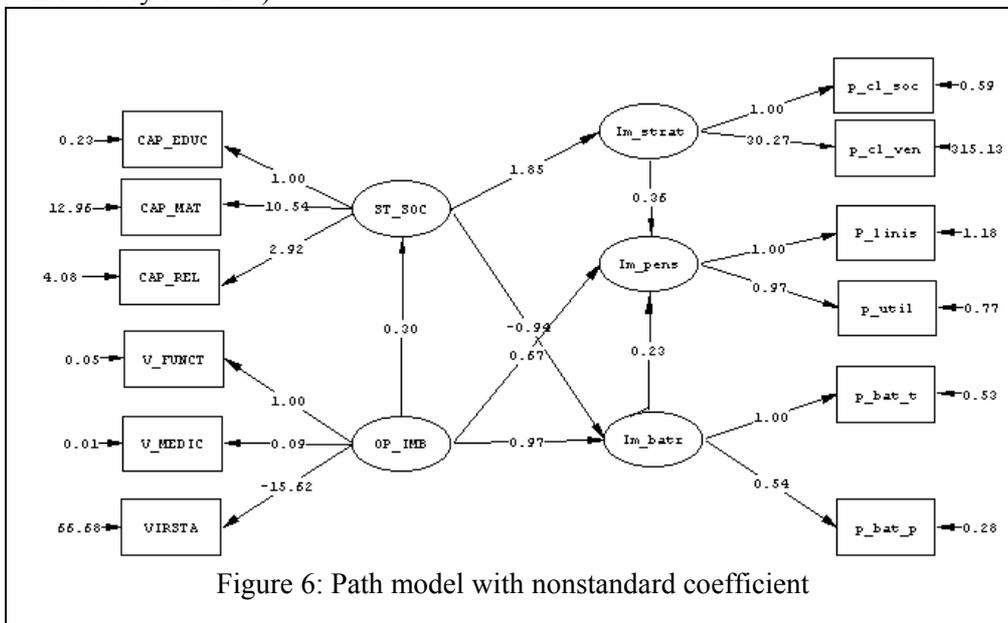
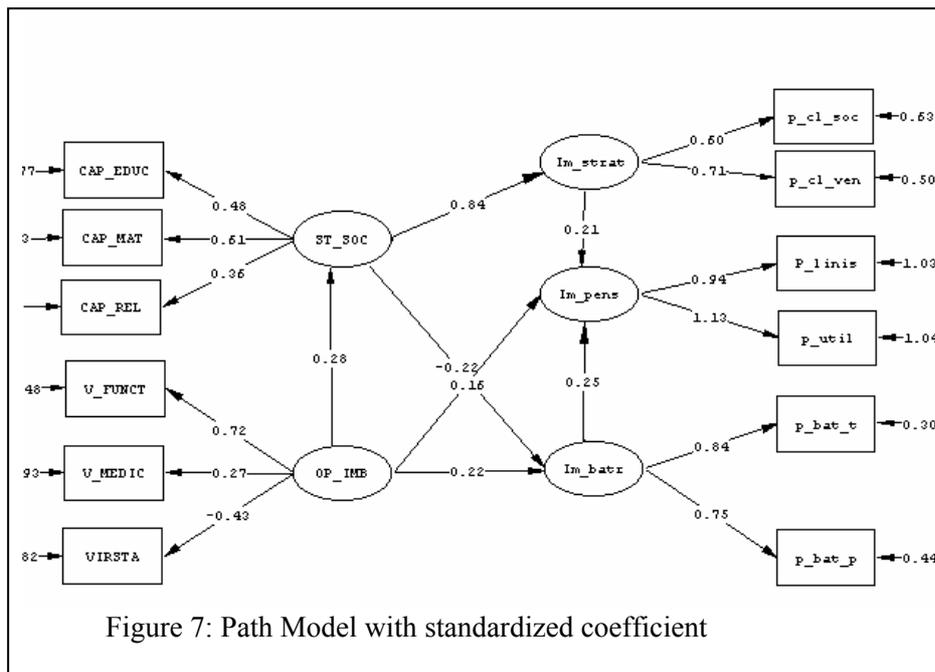
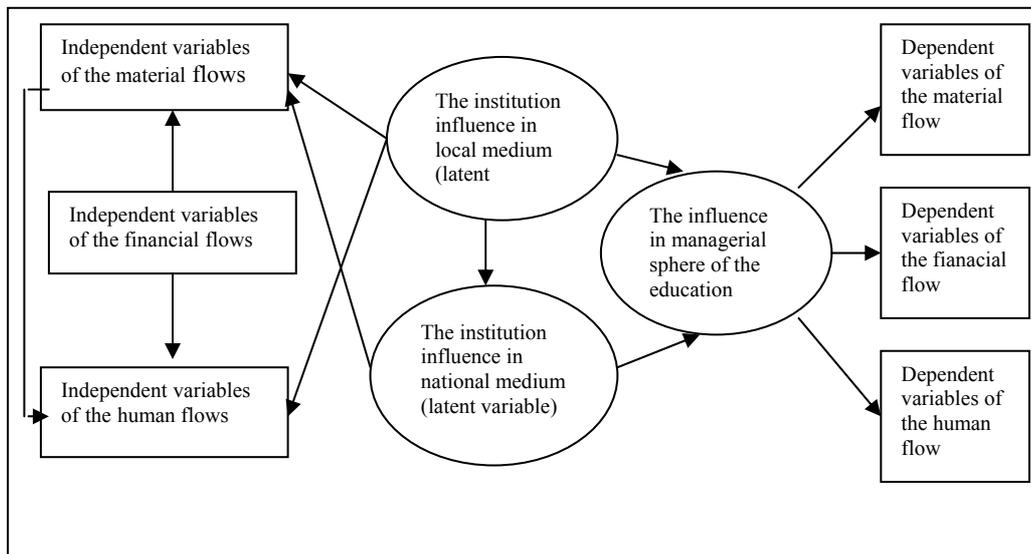


Figure 6: Path model with nonstandard coefficient

The structure relation's sets with standardized regression coefficient could be individually illustrated, like this:



The authors suggest another pattern for data modelling from an institutional strategic plan.



Here come two examples of independent variables of financial flow: school taxes settled by students for training and subsidies from the budget; the salaries pay to T.E.S.A. staff represent the example for dependent variables from the same flow. Following this model it is obvious that independent variables of the financial flow can not directly dictate the dependent variables of the same flow.

We can count the coefficient' partial regression by introducing in the model some concrete data from the institutional plan, or in other terms, we can count the coefficients of separate influence from any variable included in the model, no matter if it is independent, dependent or latent.

BIBLIOGRAPHY:

1. Joreskog, K; Sorbom, D. (1993). *Lisrel 8: Structural Equation Modeling with the Simplis Command Language*, Scientific Software International, Chicago
2. Marina, L. (2003). *Analytic explicative patterns of oldness at aged people*, Annales Universitatis Apulensis, Alba Iulia
3. Marina, L., Kadar M., Voiculescu, E. (2000). *The Social Impact of the Internet*, pag. 100-105, in PERSPECTIVES IN HIGHER EDUCATION REFORM, vol. 9, published for AUDEM, Tennessee, october
4. Marina, L., Millea, V, Râșteiu, M., Filipescu, C. (2003), *Advanced analysis techniques in social sciences*, vol. 2, Aeternitas, Alba Iulia
5. Norusis, M.J. (2000), *SPSS 10.0 Guide to Data Analysis NJ*: Prentice Hall
6. Sandu, D. (1999), *Social space of transition*, Polirom, Iași.

Authors:

Lucian Marina, lmarina@uab.ro

Florea Voiculescu, fvoiculescu@uab.ro

„1 Decembrie 1918” University of Alba Iulia