Business Model With Virtual Linearity Using Statistical Inference Tool (VL-SIT)

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ABSTRACT: Business Model is an approach to resolve structural complications encountered during business process design or during modification to remove typical business-process problems in terms of process hierarchy or execution hierarchy or any other design related business rule implementation hierarchy Such problems are normally unresolvable by simple methods or through mathematical methods or even statistical analysis or Relational Database systems with statistical analysis tools But there is a need to resolve every such complication before the model is implemented for practical use or at least some optimization to reduce the effects of natural non-linearity on actual process due to multi-dimensional cross-linkage between the process parameters and liquefiable numeric weight values Although the structural fabric of Business Process design involve many cross conflictions in terms of Commercial parameters such as process profitability or profit-credentials or any value-added subentity in the context of business statement language when converted into model language such as Mathematical relation or statistical declaration or an approximate probability proposition So a workable concept is adopted to select the virtual linearity as simulated representation of a articular business process using statistical inference based on existing data model fitted on some running processes which has relations from Mathematical inference as a solution to common business problems. The tool is a direct rule based selective inference linked with virtual parameters assigned to simulate linearity keeping actual data affectivity on main process as to minimize the non-linear behavior as par as null or even void in certain short turned around processes loops A business model with simulate able virtual linearity may represent an easy and workable process to be able to repeat the process cycle multiple times without any noticeable drift of factor responsible for process outcome due to (VL-SIT)

Keywords: Business Process Design, Structural Complications, cross-confliction, relational business process data, statistical inference tool, Rule-based selective inference, simulated linearity.

1 INTRODUCTION

Business Process Design requires deep and thorough workout taking all parametric considerations into account using tools from Modern Mathematical Sciences under the specific caption of “OPERATIONRESEARCH” as a sub-domain of the mathematical sciences, The “OPERATIONRESEARCH” has grown-up with smart and prompt solutions easily convertible into simulate-able modeling for comparisons and ratings particularly for a new process design This capability of ”ORM application” is further elaborated in terms of its core effectiveness when the application is transformed into virtual linearity block by block and stage by stage with powerful software supported by computer sciences, as the distinct virtuality of computerized concepts can be quickly transformed into practical reality of the designed business process The statistical inference is the tabulated archives of consistent data in a pre-determined and well organized substitution indicating parameters to variables and parameters to constants indexing links The Virtual linearity is a simulated relationship with lot of adjustments and compromises between operating parameters and the responsible variables with certain reservations and short comings The (VL-SIT) works well at least for very odd nonlinear business process which cannot be defined by single mathematical equation due to inherent cross conflictions in between structural components belonging to the main business process equation designed The main constraint in solving nonlinearity of a representation is the non availability of the trend determining factor; one can only rely on previous data to assume future value of the business process equation or a statistical value estimator using statistical inference Statistical sciences are now being supported by “Very high speed data processing computations” and can be used to resolve up to some extent the ”unpredictable non-linearity” of a business model at key decision layer of the process where numeric weights of many parameters exhibit a cross-confliction Using some powerful software to process the statistical inference such abstraction of nonlinearity can be virtually fixed as linear rulings and can be backed by suitable mathematical procedures to work as (VL-SIT) A mathematical workout of above business model with problem of non-linearity needs some data points which can be easily plotted into simple linear mathematical matrices for linear outcomes Specific to the general business modeling the mechanism of a business process design or devising most suitable process under multiple business parameters is a laborious task in terms of real commercial or economical components because of its inherent nature of opposing business rules conflicting with operation flow Numerous designs of business processes have been suggested to meet growing demands of well-ordered articulated easy-to-fit and cost-effective architectures as per (Hamel 2000;Hawkins 2002; Rappa 2006; Weill and Vitale 2001) but none of the design was found to be free of criticism of various issues of a true and eventual business process Although some designs are more detailed and prescriptive of the business functions as per (Chesbrough and Rosen bloom 2000; or Dubosson-Torbay, Osterwalderet al. 2002; But the global liquefaction against exchange rate disqualified the processes designed and the ”Research” that proposed separate components of business models was also found prolific like (Afuah and Tucci 2003; Altand Zimmermann 2001; Linder and Cantrell2000; Magretta 2002; The ease in selecting a Statistical Inference is the application of ”Bayes’ Theorem” under ”Bayesian Function” and Bayesian function tests with Non-Bayesian tests on organized databases or data models Let some designed business process identification is required for its behavior as linear or Non-linear in predictive decision hierarchy with following general hypothesis

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Hypothesis #1 number one: All the business process inputs are homogenous and equitable for any arbitrary weight assignment to set any numeric comparison or to execute any numeric operation **Hypothesis #2** number two: All the business processes are unified in nature and unidirectional in processing scheme (No effect of Back propagation of the data which can alter the outcome) Now two distinct variety of process models one as NON-LINEAR and other as LINEAR business process are possible after the workout and setting the goals and objectives of the business process **Hypothesis #1** can be numerically estimated as the 95% of the input due to its homogeneity produces Non-successful result on Bayesian Test and so it also confirms the "Hypothesis statement" of equity in processing scheme Similarly Hypothesis #2 is converted into a numeric value statement as 85% non-linear process forwarding in general selective outcomes Which reveals that only possible process with non-linearity can be qualified as successful Bayesian Test qualifier as 85% and the first application cycle through simulation mode pretend 85% Processes as NON-LINEAR and only 5% qualifies as LINEAR now if the Virtual Linearity is imposed then the possibility of turning a NON-LINEAR business process model into a LINEAR one will become

Successful Bayesian Test Frequency

LINEAR	NON LINEAR
0.05	0.85

Non-Successful Bayesian Test

LINEAR	NON LINEAR
0.95	0.15

This (2 X 2) Filter now provides a basic strategy of conflicts removal between Non-Linear Population of business processes and Linear Population of Business processes as declaring (BTS-Frequency) as the Bayesian Test Successful frequency and (NSBT-frequency) as the Non-Successful Bayesian Test frequency on three modules of thick density Data table

BTS-Frequency

LINEAR	VIRTUAL LINEAR	NON LINEAR
0.05	0.78	0.07

NSBT-Frequency

LINEAR	VIRTUAL LINEAR	NON LINEAR
0.95	0.22	0.93

So a forced linearity which in fact cannot be imposed on a natural process designed for a real business system can be re-designed with a virtual process feeding linearity wherever it finds a loop escaping at co-relations and maintains throughout the process-turn-around-time until at the final phase or at least at the end of the cycle

2 Selected Method And Adopted Methodology

The base method selection is based upon the data filters applied and alteration of a particular business rule to avoid observed non-linearity in the business process design taking Statistical Inference as the decisive indicator to alter the data generating rule The Business Rule as base definition of the process Model from the generated data clusters first filtered out by a weight assigned (2X2) Argument Matrix and then the Bayesian Function Modified for induction of some closest linearity or compromised linearity through Virtual linearity data inclusion VL-SIT is an induction over a process data cluster by applying minimum possible weight-assignments to various data generating relations or business rules obeying a mathematical equation to handle the variables of choice in a business process of unpredicted non-linearity using Bayesian Statistical analysis techniques determined from well-organized business process data clusters

3 Structure Of The "(VL-SIT)" Tool

A Common Business Model with some natural non-linearity observed or predicted by designed feature of the process flow chain with a mathematical representation indicating the exponent of non-linearity is selected for tool testing structure as per definition And taken as process outcome [Y(x)´] verses input variables [(x as linear variable x´ as non-linear variable)] Such that a predictable non-linearity can be observed between any two data clusters samples taken at random for any simple business outcome [Y(x)]´ which is associated with linear input variable (x) That is the situation where a system's non-linearity takes effect on the process out come as [Y(x)]´ And now under (2X2) situation matrix the possible outcomes are four distinct classes

(a) A linear input to produce a Linear Output
(b) A Non-linear input to produce a Linear output
(c) A linear input to produce a Non-linear output and
(d) A Non-linear input to produce a Non-linear output

Situation-1 It is evident by default design of the situation matrix that the process transparency is available on at least two situations **Case:** (a) Where outcome [Y(x)] is linear and the input (x) is linear **Case:** (d) Where outcome [Y(x´)]´ is Nonlinear with some specified Non-linear input (x´)´ **Situation-2** It is also evident by default design of the situation matrix that the process is not transparent when either the input is linear or it is non-linear but one situation is most likely favorable among at least two situations Now the objective is to remove the transparency of the process in case (b) without much significant alteration of the process itself to get a linear outcome[Y (x)] for a Non-linear input (x´) and at the same time to maintain the transparency as in the case (a) Similarly case (d) is to be treated in such a way that the concerned outcome [Y(x´)]´ be modified to [Y (x´)] which is linear one at Non-linear input (x´) Let by definition the business process of outcome [Y (x)] is in linear correlation with input [(x)] at some exponential coefficient "e^{sm}" and at certain numeric value of the process specific slope "S_m" as the exponent value **Data Tables**: A business process model is taken into consideration as follows for thick data to organize a relation between business co-factors K based on coefficient adjusted and inference index with correlation and the process outcome of situation matrix M.

POS: Point of Sales (In Numeric value and in numeric order)
CMD: Commodity (Computers Imported in Numeric value)

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CROS: Cash Returned On Sales (Cash value in + numeric value)
CCOS: Cash Consumed On Service (Cash value in - numeric's)
ROIG: Return On Investment Gross (Cash value in numeric)
COSI: Cash value of Stock Inventory
CRBT: Cash Rolling on Business Transactions
NBE: Non Business Expenditure
SAE: Suspense and Accidental Expenditure
BTF: Business Transactional Factor

TABLE I *A data to organize a relation between business co-factors K based on co-efficient adjusted inference index with correlation and the process outcomes of situation matrix M*

I	II	III	IV	V	VI	VII	VIII	IX	X
POS	CMD	CROS	CCOS	ROI	SOCI	CRBT	NBE	SAE	BTF
1	120	4800K	56051	9690	7654K	2706K	4435	8761	6.9
2	240	9500K	86742	8892	6752K	3433K	5434	9987	9.7
3	360	145M	113M	171K	102M	5641K	6547	100K	9
4	480	124M	112M	980K	889M	6677K	987K	145K	8.8
5	600	231M	132M	116M	234M	144M	189M	450K	7.9
6	620	4800K	56051	9690	7654K	2706K	4435	8761	6.8
7	640	9500K	86742	8892	6752K	3433K	5434	9987	9.5
8	660	145M	113M	171K	102M	5641K	6547	110K	9.1
9	680	124M	112M	980K	889M	6677K	987K	143K	8.7
10	700	231M	132M	116M	234M	144M	189M	456K	7.6
11	920	4800K	56051	9690	7654K	2706K	4435	8761	6.9
12	940	9500K	86742	8892	6752K	3433K	5434	9987	9.7
13	860	145M	113M	171K	102M	5641K	6547	100K	9
14	880	124M	112M	980K	889M	6677K	987K	145K	8.8
15	800	231M	132M	116M	234M	144M	189M	450K	7.9
16	820	4800K	56051	9690	7654K	2706K	4435	8761	6.9
17	840	9500K	86742	8892	6752K	3433K	5434	9987	9.7
18	860	145M	113M	171K	102M	5641K	6547	100K	9
19	880	124M	112M	980K	889M	6677K	987K	145K	8.8
20	980	231M	132M	116M	234M	144M	189M	450K	7.9
21	120	4800K	56051	9690	7654K	2706K	4435	8761	6.9
22	240	9500K	86742	8892	6752K	3433K	5434	9987	9.7
23	360	145M	113M	171K	102M	5641K	6547	100K	9
24	480	124M	112M	980K	889M	6677K	987K	145K	8.8
25	600	231M	132M	116M	234M	144M	189M	450K	7.9
26	120	4800K	56051	9690	7654K	2706K	4435	8761	6.9
27	240	9500K	86742	8892	6752K	3433K	5434	9987	9.7
28	360	145M	113M	171K	102M	5641K	6547	100K	9
29	480	124M	112M	980K	889M	6677K	987K	145K	8.8
30	600	231M	132M	116M	234M	144M	189M	450K	7.9

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4 Statistical Inference

The Data tables are highly non-homogeneous as per records and tabulation of the selected parameters of a business process and Statement indication represent many conflictions with the process itself in cross either with value or with rule Process Predicted Non-linearity is indicated by the data field of CMD and ROI verses POS Field Now Bayesian Function will be used to resolve some issues on available nonlinear linkage between data items and the generating rules of the business process The Hidden randomness of the process flow cannot be predicted by any probability algorithm but can only be estimated as a rough index over available data of such situation So (SL-SIT) which is based on coefficient adjustment and inference index with co-relation compensation takes the row and column wise operation to induct a "VIRTUAL LINEARITY" and thus the generating rule is slightly modified to produce a comfortable linear output against linear as well as non-linear input to the business process

5 Algorithm

The main procedure to impose statistical linearity using different parameter which is linked with each other in a non-linear relationship. The main data difference is taken as course index of change in the inference of business rule [Y(a) α X(b)]and the least data difference will be taken as five index of change in the inference. The general adjustment of the non-linearity will be carried out by summy the two opposite indexes for one key point. The Algorithm include bayesian test using a 2x2 matrix of the conditionality depicting the possible cases of outcomes verses input, there are two hypotheses, one is the situation -1 which is described by the default design of the situation matrix and the situation -2 is described by the another possible condition.

6 Non Linearity Curve

$Y(a_1), Y(a_2), Y(a_3)\ldots\ldots\ldots Y(a_n)$

Where

$a_1, a_2, a_3\ldots\ldots\ldots\ldots\ldots\ldots a_n$

are statistical data points for corresponding key parameter x(b) there are

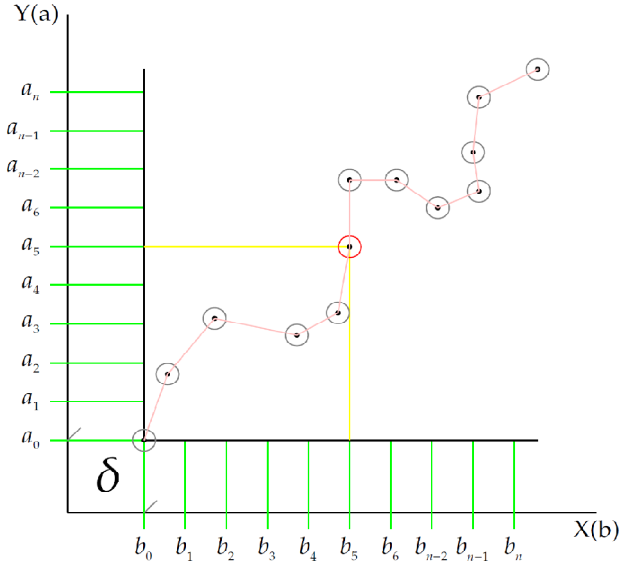
$b_1, b_2, b_3\ldots\ldots\ldots\ldots\ldots\ldots b_n$

Statistical value points

VL-SIT INDEX ∆, δ

$$\Delta = \boldsymbol{S_m} = \left[\frac{\overset{MAJOR}{\widehat{x(b_m)}} - \overset{MINOR}{\widehat{x(b_n)}}}{b_m - b_n}\right] \boldsymbol{y_0(a_0)} \qquad (1)$$

$$\boldsymbol{\delta} = \boldsymbol{S_n} = \left[\frac{\overset{MAJOR}{\widehat{x(b_n)}} - \overset{MINOR}{\widehat{x(b_0)}}}{b_n - b_0}\right] \boldsymbol{y_0(a_0)} \qquad (2)$$



7 Result And Discussion

Many complicated business process were selected and the extended data and is testing using (VL-SIT Tool) and the outcomes exercises found in-conformity of the proposed linearity. The first result from a multinational computer selling company is tested using (VLSIT Tool) on the inference of six parameter out of nine and the BTF (Business Transactional Factor) has been achieved very closed to 90%, which is a successes. The test result shows BTF (Business Transactional Factor) of below 5.7% is up lifted to 6.9%.

8 Conclusion

The virtual linearity is a simulated relationship with lot of adjustment and compromises between operating parameters and the responsible variable with certain reservations and short comings. The mathematical work out of (VL-SIT Tool) of above business model with problems of non-linearity needs some data points which can be easily plotted into simple linear mathematical matrices for linear out-comes. (VL-SIT Tool) works well at least for very odd non-linear business process which cannot be defined by single mathematical equation due to inherent cross confliction in between structural components belonging to the main business equation designed

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