Competitive Global Environment :Simulation and Analysis Using OOP Technique

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Abstract:

The Success of companies that execute Business within Competitive global Environment depends on the degree of compatibility between Business strategy and effective Global Information System. Each of these factors has an effect on the other. The Business strategy depends on the strong Support to their Dealers around the world applying Effective global information system.

This paper presents model for Simulation of companies in competitive Global Environment. The simulation is integrated into a large Scale competitive Global Environment model. Which includes Business strategy and Information system? An Object oriented frame work has been used as a development Platform presented results provide and insight into the population dynamics and distribution of Dealers. The transfer of Sales Quantities through the information system is analyzed with the model and some estimations are made conceding the type of sailing control found in competitive Global Environment system . By analyzing the number of companies in Global market and the dynamic of Dealers population, the trend and value of Sales in the system are estimated. This is important in determining the CGE System value of resource. The model was also used 'to test the impact on Companies Population of different development Scenarios the Competitive global Environment (CGE) due to urban growth and development of Information system due to the development of networked computing that links number of computers and other electronic media by Tele communication network were compared to reference situation and impacts of increases in companies stock were examined.

1-Introduction

The Global Business driver framework gives a powerful tool to determine Business Entities like Suppliers ,Consumers, Projects and demand which will benefit from Integrated global Information technology Management system . The basic idea is to apply the information Technology through global Business Drivers Specialized to the company of Industry. The Business Derives means " Quality , risks reduction ,Suppliers" and these entities work as Drivers which benefit from Global Economics , In that way it can add a value to the Global Business strategy which can use it as a tool to estimate High stages of information demand around the world . Drivers search about in time and future needs a focus on the Global Investment. We can determine the Global drivers by Global vision and Strategy using (CSF) (Critical Success factors) approach to determine ct. By on country unites, Functional Areas, and levels of management. When we determine the drivers we can put the Basics of information technology Strategy , beside that it will be the base of Specific data , applications an infrastructure that are the companies need it . The drivers can also determine the organization structure and communication network for sharing data overall the Space of company. The model can determine the internal value chain and External value system for Industry [Al – Hamdani Dr. Rafah 2002]; we can put the drivers in the following diagram.

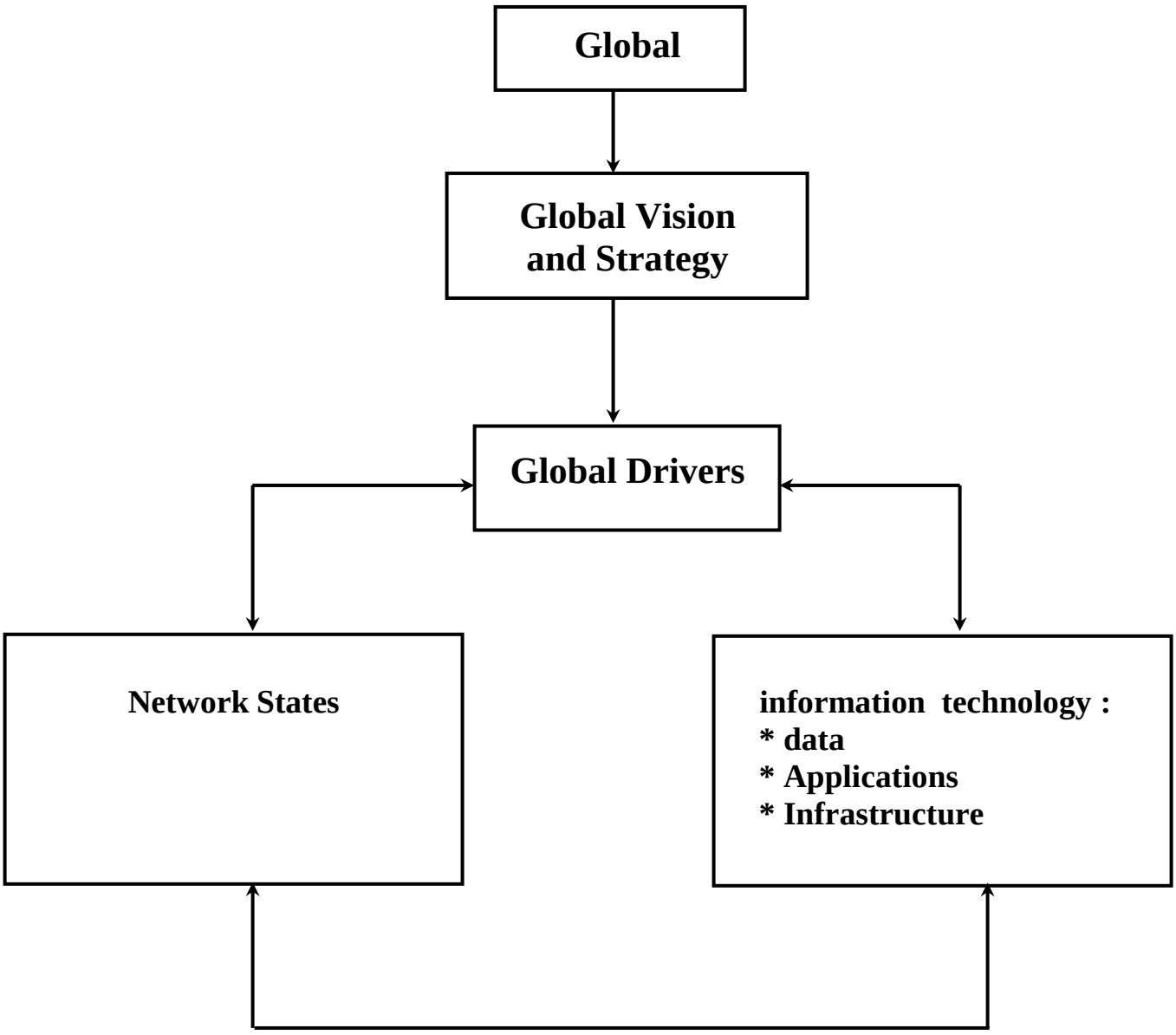

Figure I : the connection Between Global Vision And Information technology we use Global drives

The Simulation of higher tropic levels in competitive global Environment (CGE) is important for several reasons to Provide a comprehensive description of the Global information system to give an evaluation of the Companies life cycle and estimation of production and stocks to assist decision makers .Knowledge of companies behavior and their stock variation are important tools for effective companies management .

However, competitive Global Environment (CGE) Models are usually based strictly on population dynamics is (stock recruitment model, which response to changes in Effective Information System.

In order to develop a (CGE) Model it is necessary to Simulate Business strategy which depend on suppliers (Dealers) , Consumers , Projects , Demand this is particularly true with company behavior dominated by population dynamics processes.

Companies go through different stages and successively display behavior of companies and Dealers Population. Because the Stock of today determines the company sales Quantity of tomorrow. Under standing the way those stocks are regulated may contribute to a better management of company stocks . The stock varies not only from year to year (through variation in year . Class strength due to a variety of causes) , but over long periods , the relationship between stock recruitment and company stock are non – liners , and the factors that regulate them are not directly correlated .

The approach taken in the present paper consists of simulating the dynamic aspects of companies behavior (including early life stages that are regulate by Business strategy and the population of Dealers which redistributes the Quantity of sales in the Global market .

The general aim of this research was to develop a Simulation of Global companies population incorporating known dependencies (Business strategy and Effective Information System) . The Specific objectives of this research were to develop a model for Simulating a competitive Global Environment in order to reproduce the stock recruitment with different year . Classes to integrate the competitive Global Environment model into a large – Scale model and to analyst the system's response to deferent Scenarios for initial company Stocks.

2-Description of the System

The model was built for the Global market (figure 2 illustration the numbers of companies in three Regions (America ,Asia , Europe) and the Business Strategy Which includes the Suppliers Customers , the projects and the Demand (Quantities) .

	America	Europe	Asia
No. of companies	13089	1576	1936
Business Strategy :			
Suppliers (Dealers) (thousand)	43.5	25.0	17.5
Consumers (million)	16.2	10.5	7.1
Demand (by million)	11.1	7.2	5.3
Project	3.5(~4)	4.8(~5)	7.9(~8)

(Figure 2): Shows – the number of companies Business Strategy

3 – Description of the Modeling Approach

The present model (CGE.CPP) has been built using an object oriented approach , which has several advantages for this kind of implementation , competitive Globule Environment (CGE) system can be described in a much more natural form using an object oriented programming (OOP) approach and the different object may interact with each other in different forms . Offering great flexibility in the Simulation. One of the most Useful features of OOP is the ease with which major change in models can be introduced with a minimum recording .thus ,an oop language (C++) can model the complex competitive Global Environment (CGE) very flexibly and simply .

(CGE CPP) uses OOP to simulate process in a CGE system . It is designed for modular constructions of CGE system model analysis and simulation of the system. Prediction of the evolution of (CGE) system based on changes in its components , and real – time addition and removal of CGE system compartments to test system response . The program acts serves as an interface between a modeled (CGE) system

and users who are able to select the objects they want to test and easy modify initial conditions , parameters and forcing functions .

The overall structure of CGE system model is shown in figure 3 . In brief , for the Global market , the model framework is that a box model , consisting of (n) boxes [in this paper n = 13] , the exchange between boxes is for " multinational corporations " objects dependent on the product flow imposed by Global competition inputs to the system and diffusive exchange between boxes .

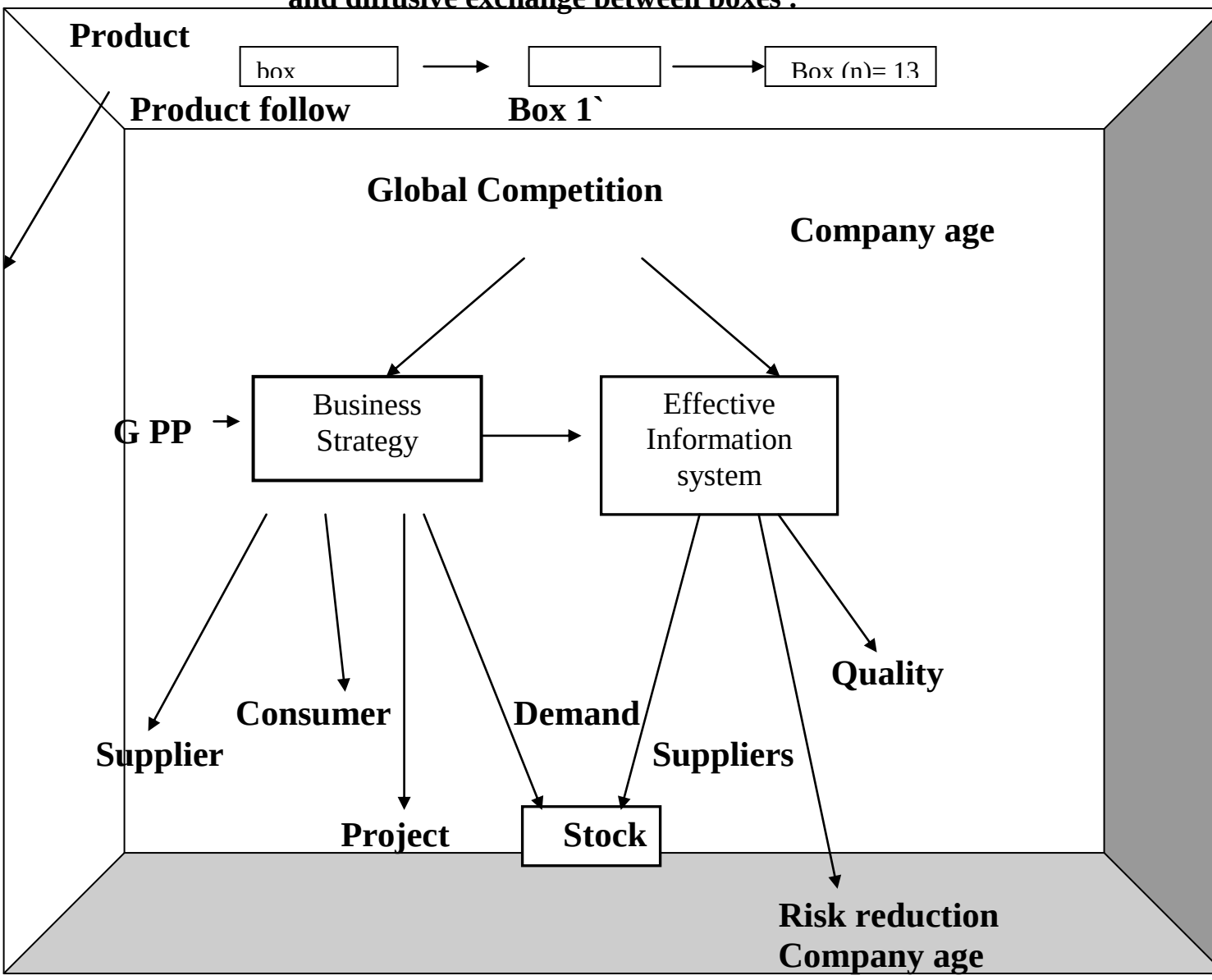

Figure 3 :shows overall structure of CGE system model

The CGE Model implemented in CGE .CPP is a one dimensional vertical integrated box model , within which the physical transport drives the Business strategy and – their factors sub models interact with each other the CGE objects built into the model include Multinational Corporations, companies which works in the field no.of Import and Export .

Forcing functions and boundary conditions include the product produced and effluent loading fiddled exchange (Suppliers, Demand Quantities, Consumers, no. Of projects.

The state variables are read by CGE.Cpp of start – up and provides the system with data on the initial condition for Simulation . Each objected contributed with its state variables to the model and can be switched on or off for different simulations .

4 – Modeling the Companies Stocks

As mentioned earlier the stock recruitment model responds to Changes in the effective Information System.

Figure 4 shows all the functions that regulate individual Quantity Sales applied to Dealers . Company growth is influenced by the availability of Suppliers (Dealers) , Quality , Risk Reduction . The general equation used to describe the fluctuation of stocks was:

$$\frac{dB}{dt} = G + L - (D + S + R) \pm M$$

where B = Quantity of Sales , G = growth of companies L = recruitment , D = Damaged , M= migration of companies , S= Shortage , R = changes in the Model of product (it is effects on the Quantity demand) .

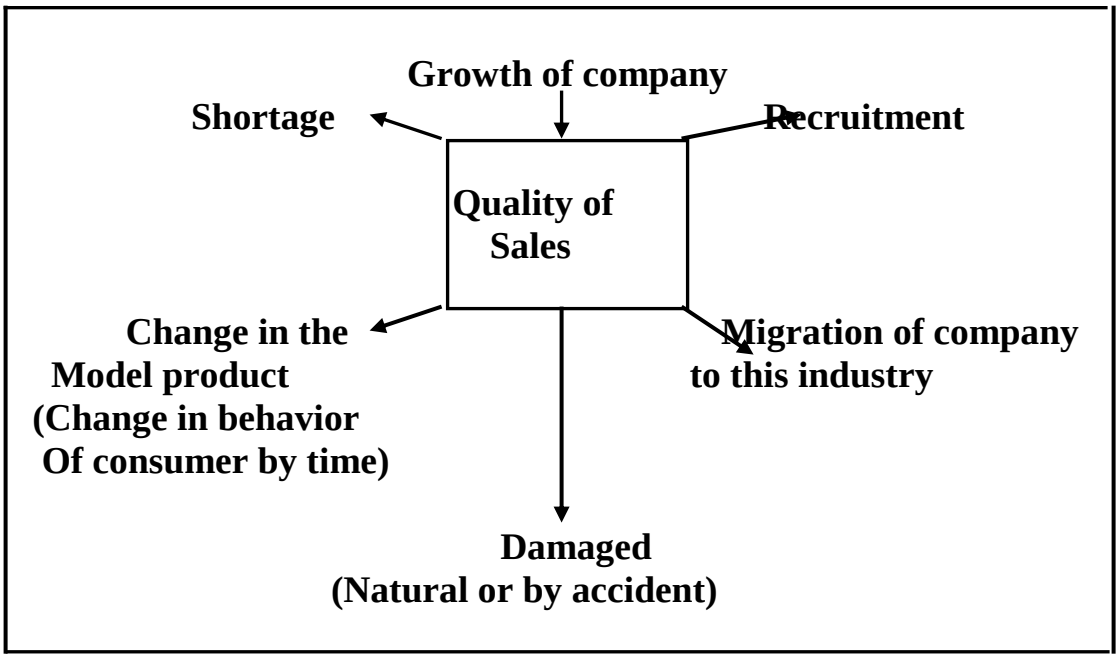

Figure 4 shows all the functions that regulate individual quantity sales applied to dealers.

The growth of a company can increase the company's power, and increases their profit by increasing her share in the market, and obtain more consumer or sale more products and services in the Long term. The companies growth follow the following equation, essentially depending on the business strategy presented in the box (figure 3) and on the Global competition

$$G = G_{\max} = \frac{\frac{P - P_O}{w_f}}{k.t\left(\frac{P - P_O}{w_f}\right)}$$

were G_{max} = maximum growth rate depending on Sale , P = maximum Quantity of Sales ,w_f =Quantity of sales and k_s = half saturation constant .

The new companies also assumed to get a market share and their growth is based upon the following equation .

R = R_{max} $\left(1 - e^{k(P_O - P)}\right)$

Where R = ration , R_{max} = maximum ration and k = grazing constant

It is assumed that , initial companies , middle companies can not move effectively and that they are transported passively by product flow and redistributed through the whole Global market . The activity for

adult company and the middle company has been implemented based on company preferences for Information system , company age , Global competition this method permits the redistribution of adults and middle based mainly on Information system availability . The parameters used for simulation are given in table II .

(CGE.CPP) makes it possible to simulate different scenarios and compares them to the company production of the standard model . The first scenario used was the standard model the second simulated an increased Business strategy load (represented as Drivers input and the third and fourth scenarios simulated different initial company sales : (10) times the standard model , which could represent the entire company population of the Global market , and (50) times . Which could be an exceptional year – recruitment result . These scenarios were both tested with and without External effective on companies pressure , based on a 5% west (losses rate taken from the company production .

Table II : Parameters used in the model

Adults :	
Maximum adult growth rate	**0.0123**
Growth rate at constant Global competion	**0.0693**
Halt – saturation constant	**0.2**
Damaged rate	**0. 125**
Shortage	**0.1**
Changes in the model (change in the consumer)	**0.0154**
Behavior which effect on Quantity demand rate	
Migrate on	**0.005**
Early life stages	
Middle company growth rate	**0.0693**
Middle company migration	**0.01**
Maximum middle company growth rate	**0.009**
Middle company growth rate at constant Global Competition	**0.0693**
New companies growth rate	**0.2**
New companies migration rate	**0.29**
Maximum new companies growth rate	**0.25**

5 – Results and Discussion

Response of the system

Table III compares the responses of the system, the company contribution is not very significant interms of concentration, but considering the volume of Global market, there is an important mass change. Damaged, shortages, changes in the models and migration of adults middle company contribute with some wastes (losses), but this amount is trivial compared to the amount already present in the Global market.

The model runs which include the company show increased waste (losses) in the company age column due to the (shortage , migration , damaged . change in the models) and decrease in alternative commodity Predictably reduced grazing pressure by alternative products leads to higher companies migration concentration .

Even under high prediction by initial , middle and adults companies the alternative products decreases only marginally about 5 % which indicates that – these is lack of top – down control in the system .

Table III Average values of waste (losses), alternative commodity and migration for entire Global market of standard model with or without External effective.

	with	without	Percentage
Losses (in Quantity of sales)	5.29	5.52	4.3
Alternative commodity	37.49	35.7	- 4.8
migration	8.03	8.45	5.2

6 – Population Dynamics of the Company Stock

The Simulation shows the successive life stages and the Quantity of Sales of each year class (figure 5). Each life stage begins with new or transfers from previous stage and decreases by migration or after the transition to the next stage. The variations in initial and new companies Sales are similar because migration is the only process considered. There is a low rate of growth for initial and new companies. which the middle and adulates ones have high growth curves Since the alternative products threshold is not limiting in one season (Figure 5) shows only

the results of the middle Global market . But to lose Quantity is distributed through the Global market by currents and migration activity.

As losses response with companies is not significantly different (table III) and shows on top down control the losses object is not very sensitive to the increased sales Quantity scenarios (Table IV) . As expected, companies' production increases with the increase of initial values, but these responses are non – linear. The Global market pressure takes between 74 % and 77 % of the production and gives an idea of the potential annual company catch for the entire Global market which varies from $115 – 641 per year . Corresponding to an annual direct resource value of up $640000. Global market pressure decrease production non linearly , due to the nature of the relationship between production and basis metabolism functions . In the third and fourth scenarios , Companies production doubles for five fold high initial value .

The different life stages in the early life history of company make it possible to follow the periods of abundance and the general behavior of the stocks and provide information about their life – cycle variability and can be extrapolated . To some extend , to other companies .

During the sensitivity analyses , some non – specific parameters (e.g shortage , damaged , changes in the models unrealistic parameters (e.g instantaneous migration rates) , or non – existent ones (initialization stress) were identified : these were used with caution . In particular cases , the description . identified led modifications in order to calibrate the model .

An analysis of the reasons for these differences may be a useful focus of research emerging from this research . Although the model cannot provide the correct value . It helps to examine the consistency of the parameters , and indicated a range within which these may be situated. The in congruity between the field measurement of parameters such a migration and model requirements forces us to constructively analyses not only the model's conception and formulation , but potentially the available experimental data , as well .

The integration in this model of Business stage . Information system processes , company life – cycle adult companies , business and production is an innovation approach to competitive Global Environment . It enabled us to create a scenario analysis where effects of specific variables (e.g stock increase , Business strategy load) may be observed directly , rather than only indirectly as in population dynamics

approach with further development . This model may be used to provide some measure of impact of Global market due to the export of companies the seasonal dynamics of migration .

Table IV Average values of companies production in tons per year for the whole Global market . in different simulation scenarios . The income in ($ million)

Scenario	With losses	Without losses	migration	income
Standard Model	36	151	115	115318
Business strategy	39	169	130	130070
* 10 initial company stock	118	460	342	341914
* 50 initial company stock	202	843	641	640924

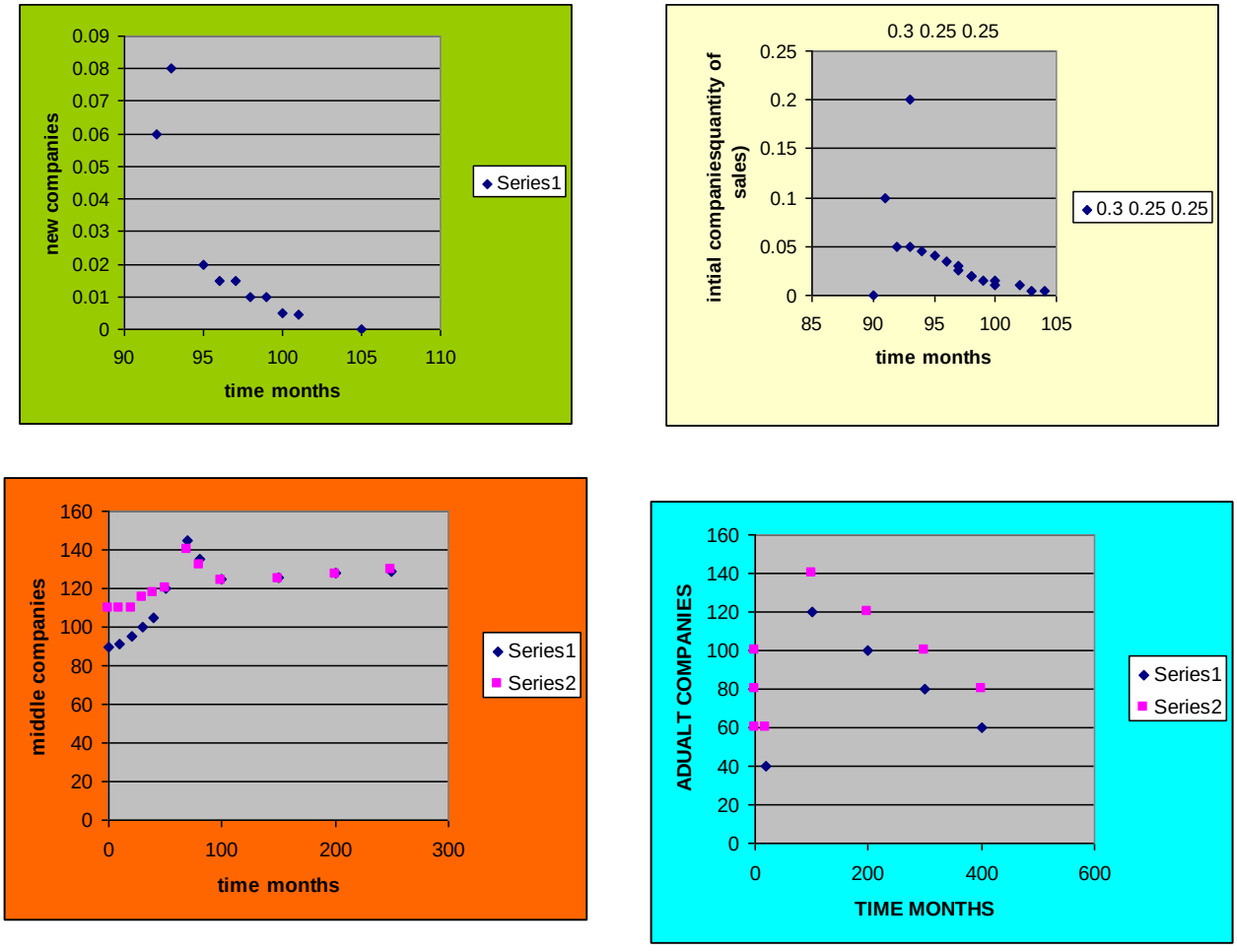

Fig. (5) Simulation of life stages of companies

الخلاصة

ان نجاح الشركات التي تنفذ الاعمال ضمن بيئة تنافسية عالمية تعتمد على درجة التوافق بين نظام معلومات عالمي فعال effective global information و ستراتيجية العمل العالميةglobal business strategy . ان لكل عامل تأثير على الاخر حيث ان ستراتيجية العمل تعتمد على الدعم القوي لبائعي المفرد dealers و المستهلكين المنتشرين في كافة انحاء العالم . وذلك عن طريق تطبيق نظام معلومات عالمي فعال .

ان نجاح المصانع والشركات متعددة القوميات multinational التي تعمل في مجال الاستيراد والتصدير في سوق عالمي شديد التنافسية ،متوقف على الصلة فيما بين انظمة المعلومات وستراتيجية الاعمال الخاصة بهذهالمصانع والشركات.

ان المخطط الهيكلي لمحرك الاعمال العالمية the global businesses driver framework بؤمن اداة لتحديد كائنات الاعمال business entities مثل المردين ،المستهلكين ،والمشاريع والطلبيات التي ستكون الاكثر استفادة من نظام ادارة تقنية المعلومات المتكامل العالمي integrated global information technology management system وان الفكرة الاساسية هي تطبيق تقنية المعلومات من خلال محركات الاعمال العالمية الخاصة بالمؤسسة او المصانع. وان محركات الاعمال هي النوعية quality،وتخفيف الاخطار risk reduction ،والموردونsuppliers ،وتعد هذه الكيانات محركاتولها القدرة على الاستفادة من الاقتصادات العالمية.

يهدف هذا البحث التصميم و تنفيذ نموذج لمحاكاة البيئة التنافسية العالمية للشركات ،و ان محاكاة هذا النموج تمت بتمثيل البيئة التنافسية العالمية لنموذج متكامل يضم كل من ستراتيجية الاعمال و نظام المعلومات .

تم استخدام البرمجة الكيانية لتصميم و تنفيذ هذا النموذج وتم الحصول على نتائج مقدرة للعوامل الديناميكية المؤثرة على مجتمع السوق التنافسية العالمية و تحليلها وفق للعديد من السيناريوهات المهمة .

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