OPTIMAL MANAGEMENT OF ELECTRONIC BUSINESS SYSTEM

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Abstract

Comprehensive electronic business (as an e-system /e-organisation/) is regarded as the most up-to-date business. For performance of its operations (e-operations) it uses Internet (as information-communication technologies), in the initial period through electronic commerce (e-commerce) as the operational part (management), and then through its extension (or upgrading) via electronic business (e-business) as its strategic part (management). Since the strategic part of management designs the e-system, and the operational part of management performs the production of electronic products (e-products), the e-system optimisation firstly determines the optimal e-system design, used subsequently as a basis for optimal production of e-products (goods, information, management and services). The innovative methodology known as Tauzović's General Continuum (TGC) was used for modern optimisation of e-system management (e-operations design and production); more particularly, its theoretical form (TGCt) for strategic management, and the practical form (TGCp) for operational management. Given that the application of different TGC forms (TGCt and TGCp) in the optimisation of e-system management confirms its validity as a modern (systems) management methodology, it is to be expected that further development in management of contemporary and future systems will be based on the Tauzović's General Continuum (TGC) methodology, particularly its two forms (TGCt and TGCp).

Key words: *Electronic business system (e-system or e-organisation), electronic business (e-business), electronic commerce (e-commerce), electronic operations (e-operations), electronic products (e-products), optimal management, Tauzović's General Continuum (TGC), the theoretical (TGCt) and the practical (TGCp) form of Tauzović's General Continuum (TGC).*

1. Introductory Considerations

Modern management, as a comprehensive process of universal goal setting and attainment, has a prominent role in structuring, functioning, improvement and further development of separate organisational units called (organisational) systems. Based on modern research, whose foundation and strategic application is the Total Quality Management (TQM), it should result not only in further development of the current, traditional and modernised advanced practical and theoretical methodologies of modern systems management, but also the identification, design, use, improvement and upgrading of the innovative practical-theoretical methodology of modern systems management. Although it can be claimed with a great level of certainty that such methodologies will be simpler for acceptance and highly usable in practical applications, it is highly likely that they will not be used so quickly (on daily basis), among other things because of the lack of the accompanying parts of management technologies (as general management knowledge) and terminology needed by modern managers.

In order for an organisation to achieve, use, sustain and develop general (total) competitiveness, the practice of successful organisations shows that they invest substantial resources in certain structural assumptions for enhancing operations. To this end, the following assumptions are taken as the most significant: 1. (Investments in) research and development, 2. Integration of resources (human and facilities), 3. Adoption of modern technologies (as a totality of knowledge used in a wider production process, i.e. in /modern/ operations systems) and 4. Continuous improvement (throughout the organisation). Establishing the need for the existence of operations systems is of special importance for all economic activities, i.e. what people do when resources are scarce to overcome the shortage. Definition of operations systems as mutually interlinked sets of extended (or upgraded) operations of organisational (operations) functions: (i) marketing (MA), (ii) resources (RE), (iii) operations (understood in its production-service, or narrower, sense – OP) and (iv) finances (FI) (Tauzović, J. T. 1998), determines the existence of organisational subsystem (as a system) particularly important for its design. Since operations systems constitute basic and main parts of (business) organisations, they must participate (both in preparation) and in making of all management decisions since only they can understand, accept, additionally improve and implement the decisions thus made. The operations systems, on the other hand, have production systems as subsystems, and these, for their part, have (production) working units as their subsystems (as organisational systems consisting of human and facilities). Therefore, the process of managing a (business) organisation is performed started from an organisation (as a business system), over the operations system and production systems all the way to (production) working units. When it comes to the research of an organisation for the needs of its management, then the process has the opposite direction (starting from the working unit, over the production system and the operations system, all the way to the organisation). Since the (modern) management functions are – (i) planning (PL), (ii) organising (OR), (iii) directing (with motivation – DI) and (iv) controlling (CO), thus: (1) marketing is used in planning (MA← →PL), (2) resource organising (RE← →OR), (3) operations directing (OP← →DI) and (4) finance controlling (FI← →CO). Based on such knowledge, modern management, of not only organisations (as business systems), but also of all modern systems (supplied with operations /organisational/ functions), may be defined as a process of effective and efficient merging of operations and managerial functions. Management helps attain the goals set which meet the needs of users of products (goods, information, management and services) of an organisation.

Modern management of (business) organisations offers to current and future managers enough theoretical knowledge and practical skills for managing total business. At the turn of the millennia the humanity is encountering substantial changes – movement towards a society based on Internet. This is the time of radical changes in the life of people – some changes already took place or are only starting, while many more are emerging. The developments in business (organisation) management through the use of information and communication technologies (ICT) – electronic commerce (e-commerce) and electronic business (e-business), including mobile business (m-business), are among the most significant. Since e-business is used to perform ICT business process, by using Internet business organisations (as partners) perform production of goods, information, management and services in the initial stage through e-commerce, and then by its extension (or upgrading) also via e-business.

Rapid advancement of technologies and their application in business (of organisations) lead to the new era of e-commerce – joint commerce (of two or more organisations) done using ICT. The practical basis for such application is provided through globalisation of operations such as the increase of international trade and the use of social and cultural values. The usage of the term e-commerce was extended with additional terms such e-business, electronic (virtual) organisation (e-organisation /e-system/), electronic marketing (e-marketing), electronic operations (e-operations), electronic products (e-products) and others, which refer to known business terms and processes done electronically.

By analysing the materials available in e-business and e-commerce, one may conclude that e-business is a wider area than e-commerce, although many (earlier) authors consider them to be interchangeable. The historic development of these areas shows that e-commerce emerged first (in late twentieth century) and through its (practical) development we have reached the wider (theoretical) area of e-business (early twenty-first century). A more detailed (systems) analysis shows that e-commerce is an (operational) subsystem of the (strategic) system of e-business. It is possible to accept that in overall business, the e-business (usually the extended – the strategic one, sometimes also the upgraded) is a part of electronic management, while e-commerce is its basic – operational part. Thus, the development of e-commerce, as a practical (operational) part, led to the e-business, as a theoretical (strategic) part of e-business (organisation). Based on modern business processes, the overall e-business is a transformation of the key business processes via Internet (INTERnational NETwork), as a large "client-service provider" system. It is a global communication network which uses transfer of information introduced in the WWW or Web (Word Wide Web) by using different standards.

Through the supply chain, an e-organisation is linked with all partners included in supply. Its management coordinates the supply activities of an e-organisation from suppliers and partners to clients.

By defining e-commerce as the total electronic mediation of information exchanges between an e-organisation and its external stakeholders, e-business is overall electronic mediation within an organisation and (an exchange) with the external stakeholders supported by areas of business processes (Chaffy, D. 2009). E-commerce, as the operational part of e-business, is divided into: 1) the buy-side – transactions between the buying organisation, its suppliers and partners, and 2) the sell-side – transactions between supplying organisation and its customers, connected by the intranet. Both sides of e-commerce use Internet and extranet (Chaffy, D. 2009).

The study of the totality of e-business, as separate modern processes (e-operations), must be based on the development of operations, especially information, systems. Although new, modern business is based on information systems, there is no difference between management in e-business and traditional information systems (Chaffy, D. 2009). The software applications, the hardware and networks as ICT constitute basic tools of an e-system of business (business alliances or e-organisations). Hence, modern approaches to management practices – e-commerce and e-business should reconfirm the existing modern methodologies of managing operations (organisational) systems, particularly the innovative methodology of the Tauzović's General Continuum (TGC).

Since there is still no suitable (appropriate) terminology for e-business and e-commerce, this paper will regard total e-business as an e-system (/e-organisation/ of business). By accepting that an e-system (of business) may be divided into e-business and e-commerce, its management may be done through strategic management of e-business and operational management of e-commerce. It may further be accepted that an e-system management levels are: (i) planning (or e-business), (ii) organising (e-operations), (iii) directing (e-commerce) and controlling (e-execution), which is adopted as such in this paper.

2. Tauzović's General Continuum (Tgc)

Modern systems approach and analysis of results obtained through comprehensive research done within the research project "Modern Management of Operations Systems" (Tauzović, J. T. 1998), may lead to systems synthesis so that components (or functions) of operations (organisational) systems may be globally – theoretically and practically – shown and studied in terms of certain areas of activity (processes), as follows: 1.P – Activities of (overall) preparations (1.1.Pe – External and 1.2.Pi – Internal), 2.A – Activities of analysis, 3.S – Activities of synthesis

and 4.C – Activities of control. Further analysis and detailed research of such relations lead to insights into what kind of relations may basically be used for theoretical and practical needs (of management) through:

{→ **1.P** – Activities of preparations (**1.1.Pe** – Activities of /total/ needs /or requirements/ for the system existence ← → **1.2.Pi** – Activities of system policies /opportunities or strategies/) →

→ **2.A** – Activities of system support (or inputs) →

→ **3.S** – Activities of system supply (or transformation of inputs into outputs) →

→ **4.C** – Activities of system assessment (/improvement/ or outputs) →} (Figures **1** and **2**).
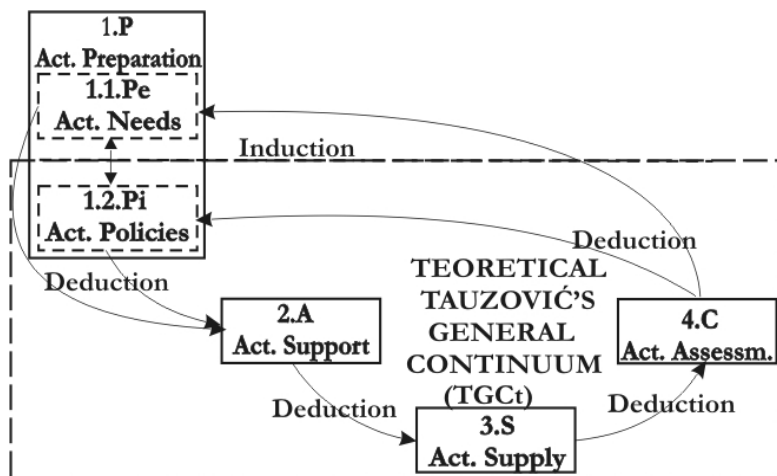

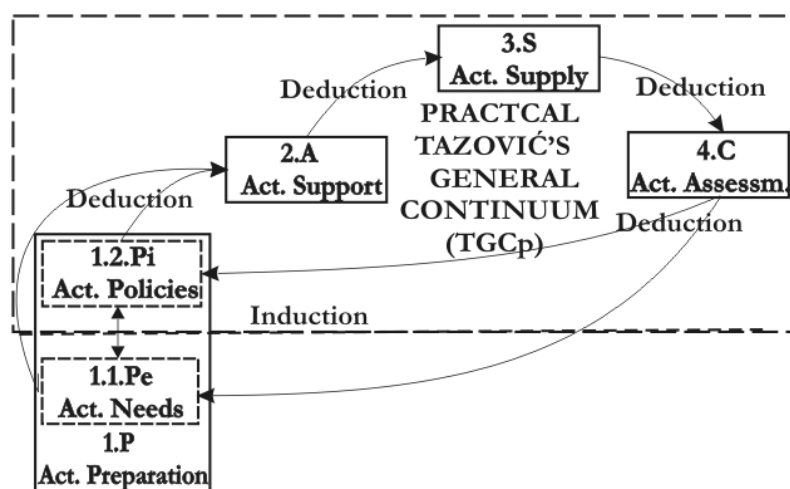Figure 1: Theoretical Tauzović's General Continuum (TGCt)

Figure 2: Practical Tauzović's General Continuum (TGCp)

With this innovative (modern systems) methodology, called Tauzović's General Continuum (TGC), it is possible to resolve problems of the system and total management, through subsequent use of the continuum of four sets: (i) cyclical, (ii) iterative, (iii) continuous and (iv) spiral activities in TGC, based on modern model of managing operations systems consisting, apart from the level of the working /and general/ environment, also of four levels: /1/ institutional (planning), /2/ strategic (organising), /3/ operational (directing) and /4/ control (controlling) (Tauzović, J. T. 1998). Such a management methodology may be divided into two parts:

(i) inductive part – consisting of 1.P – Activities of preparations (1.1.Pe – Activities of /total/ needs /or requirements/ and 1.2.Pi – Activities of policies /opportunities or strategies/) ($\rightarrow$1.P/$\rightarrow$1.1.Pe$\leftarrow$ $\rightarrow$1.2.Pi/$\rightarrow$), and

(ii) deductive part – consisting of 2.A – Activities of support, 3.S – Activities of supply and 4.C – Activities of assessment (/improvement/ $\rightarrow$2.A$\rightarrow$3.S$\rightarrow$4.C$\rightarrow$) (Figures 1 and 2).

Through the application of TGC, as a modern (systems) management methodology, it is possible to conditionally present it as a modern: (i) theoretical, social-organisational or strategic application, mostly directed to "soft" systems (social and organisational) (Figure 1) and (ii) practical, modern-technical or operational application primarily referring to modern (supplied with organisational /operations/ functions) traditionally called "hard" systems (natural and technical) (Figure 2). Various presentation (forms – TGCt and TGCp) of TGC application are directed to a more acceptable understanding and monitoring of their use in total management (research and management /in narrow sense/) of various types of modern systems. TGCp may be used in research, and TGCt for management (in narrow sense) of systems or system parts, even their levels. Such presentations of management systems offer good basis for further founding and general development of future management methodologies.

When it comes to total management, then the application of TGC may be considered, in addition to the overall one, also in particular contexts. It is applicable, apart from the (general) strategic (as theoretical) and (particular) operational (as practical) application, especially for each part or management level, and is even applicable to certain parts (activities) of managerial levels. In all cases of TGC application, the prior procedure refers to why and what should be done (as induction), and the subsequent one to how it should be done (as deduction), which again becomes what should be done, etc.

The development of operations (operations systems) from (1.2.) local, (2) national, (3) international and (4) global required the definition of (1.1.) virtual operations (e-operations). Since virtual operations represent a special form of modern operations, thus modern (innovative) TGC methodology should satisfy their management needs. Although in e-business it is possible to consider its management via its levels: (i) intelligent e-business, (ii) e-business, (iii) e-commerce and (iv) web presence (Kalakota, R. & Robinson, M. 2002), the accepted e-system management levels in this paper are: (1) e-business (as planning) (2) e-operations (as organising), (3) e-commerce (as directing) and (4) e-execution (as controlling). More modern systems usually, instead of productivity (as a ratio between total revenues and total expenditures) use profitability (as a difference between total revenues and total expenditures) as an (easier to use) performance measure, and thus an e-system (e-organisation) may be considered as a path to profitability (P2P) (Kalakota, R. & Robinson, M. 2002).

Further development of modern management will probably demand the consideration of somewhat different development of operations (as extended processes). Starting from 1.2 technical, 2. Intellectual, 3. Digital and 4. Virtual operations, the 1.1 new types of operations required for future management will be sought. This would mean that on the path to transcendent operations there are certainly new types of operations which need to be determined and studied in detail in future management.

As a single unit, the strategic and operational management of (organisational /operations/) e-systems – with its constituent parts, constitute mutually cyclical, iterative, continuous and spiral continuum. Each part of their management gives a unique contribution to total decision-making and implementation. E-system management thus structured enables in the management process of an open, complex, stochastic and dynamic system to reach the target e-system (needed to management) in which it is possible to make a unified decision in a more closed and simple manner, and as close as possible to the deterministic and static conditions (hence, the e-system). In the process of such adaptation of a (modern) e-system for decision-making and implementation:

(i) at the planning level (**PL**) or e-business – an open e-system, by using heuristic procedures, adapts to possible closeness,

(ii) at the organising level (**OR**) or e-operations – a more closed e-system, by using simulation procedures, is presented as simple as possible,

(iii) at the directing level (**US**) or e-commerce – a simpler e-system, by using statistical procedures is converted into the best possible deterministic system, and

(iv) at the controlling level (**KO**) or e-execution – such a deterministic-dynamic e-system, by using (optimisation) algorithms, is practically adapted or seen as much as possible statically (Table 1).

Table 1: Setting of an e-system and types, resources and areas of e-decision-making

TGC - Manage-ment levels	E-system (e-organiza-tional levels)	E-system setting from ⟶ to	Type of Decision	Resources		Areas of e-decision making
				Using	Decision-making	
1.P - PL	e-business	Open ⟶ Closed	Indefinite	Intelli-gent	Heuristics	Long-trem forecasts
2.A - OR	e-operations	Complex ⟶ Simple	Very stochastic	Intellec-tual	Simulation	Short-term forecasts
3.S - DI	e-commerce	Stochastic ⟶ Deterministic	Moderately stochastic	Techni-cal	Statistics	Short-term application
4.C - CO	e-execution	Dynamic ⟶ Static	Determi-nistic	Natural	Algorithm. (Optimisat.)	Immediate application

Types of decisions, resources used in decision-making and areas of decision-making:

(1) for the planning level (of e-business) – decisions are indefinite, using intelligent (including intuitive) resources, decision-making is heuristic, while the area of decision-making is long-term forecasts,

(2) for the organising level (e-operations) – decisions are very stochastic, intellectual resources are used, decision-making is simulation-based, while the area of decision-making is short-term forecasts,

(3) for directing level (e-commerce) – decisions are moderately stochastic, technical resources are used, decision-making is statistics-based, while the area of decision-making is short-term application, and

(4) for the controlling level (e-execution) – decisions are deterministic, natural resources are used, decision-making is algorithmic (optimisation), while the area of decision-making is immediate application (Table 1).

3. ELECTRONIC BUSINESS SYSTEM (E-SYSTEM) MANAGEMENT

Modern definition of management of all (modern) systems as a process of an effective and efficient merging of MA← →PL, RE← →OR, OP← →DI and FI← →CO is based on the four TGC activities:

{→ **1.P** – Activities of preparations (**1.1.Pe** – Activities of /total/ needs /or requirements/ for existence of systems ← → **1.2.Pi** – Activities of system policies /opportunities or strategies/) →
→ **2.A** – Activities of system support (or inputs) →

→ 3.S – Activities of system supply (or transformation of inputs into outputs) →

→ 4.C – Activities of system assessment (/improvement/ or outputs) →} (Figures 1 and 2).

The part that particularly stands out in this definition is what needs to be done (which e-product should be supplied at the goal e-market – effectively) and how the processes of (total) e-production need to be done (efficiently). The preparations as the initial activities of TGC are based on this, since the general (strategic) marketing (MA/s/ – based on general e-market) determines what needs to be done, while planning (PL) determines how it should be done for goals e-market determination and needs. Further TGC activities determine how to produce in the right way (efficiently) the e-products (goods, information, management and services – effectively).

Since modern management in general, and particularly in e-system (of business), may be divided into strategic (s) and operational (o), thus parts of management could further be divided into two levels each, as follows: (1) strategic – (i) planning (PL – which considers also the external preparation of planning /general – strategic marketing MA/s/ – 1.Pse/ – Figure 3) and (ii) organising (OR), and (2) operational – (iii) directing (DI – including its external preparation in strategic management and the use of individual (operational) marketing MA/o/ - 1.Poe – Figure 3) and (iv) controlling (CO). Strategic management achieves e-operations planning and design, while the operational management is used to perform contracting and performance of e-operations. In e-system planning (re-planning) out of all general (general e-environment or general e-markets) the goals e-market (working environment) is selected. In e-system improvement, the already de-signed system is (to the maximum extent possible) adapted to better achievement of its goals (working environment). Since through management processes the goals markets are determined among the general ones, then its activities are based on goals e-markets.

Since the total e-business, that is the e-system (of business) is performed by using (modern) information and communication technologies (ICT), then looking it:

1) In a narrower sense (operational, practical) e-system, i.e. e-commerce, may be divided into 1.1. electronic trade (e-trade), 1.2. electronic communication (e-communication), 2. electronic payment (e-payment), 3. electronic production (e-production) and 4. electronic distribution (e-distribution) (lower /operational/ part of Figure 3) (Bijelić, P. 2000; Tauzović, J. T. 2009), where:

   1.1. E-trade – trading activity of sale of goods information, management and services, acquir-ing revenues from advertisements and electronic exchange of documents (which follow /e-products/ money and advertisements in electronic exchange of docu-ments).

   1.2. E-communication – exchange of messages among business entities.

   2. E-payment – transfer of money and execution of payments.

   3. E-production – creation of goods and performance of all types of services.

   4. E-distribution – delivery of goods and services to the end user (Bijelić, P. 2000; Tauzović, J. T. 2009).

   Operational (starting) – e-trade consists of two levels of directing (→1.1.Poe ← → 1.2.Poi →) and the level of controlling (→ 2.Ao → 3.So → 4.Co →) and may be presented in practical (operational) TGCp of e-system (e-organisation) (lower /operational/ part of Figure 3).

2) In a wider sense (strategic, theoretical) e-system, i.e. e-business, may be divided into 1.1. elec-tronic market (e-market as a general e-market), 1.2. planning (re-planning) of business proc-esses (for determining goals e-market/s/), 2. business alliances (alliances, groups, associa-tions or e-organisation /e-system/), 3. strategic information system (SIS) and 4. continuous

improvement (upper /strategic/ part of Figure 3) (Turban, E., et al. 2002; Tauzović, J. T. 2009), where:

1.1. General e-market – establishing cooperation with different organisations (including competitors).

1.2. Planning (re-planning) of business processes – making plans of significant innovations in organisational structures and methods of performing e-business and thus setting the target-markets.

2. Business alliances – creation of alliances (groups, associations) with other organisations (including competitors), business alliances or e-organisation – e-system.

3. Strategic information system (SIS) – provide e-systems (e-organisations) with strategic advantages, enabling the increase in their e-market share, better negotiations with suppliers and/or preventing competitors to enter their e-system (e-market) share.

4. Continuous improvement – of quality, productivity, user services (particularly their efficiency and effectiveness) and competitiveness (Turban, E., et al. 2002; Tauzović, J. T. 2009).

Strategic (extended /or upgraded/) – e-business consists of two levels of planning ($\rightarrow$ 1.1.Pse $\leftarrow \rightarrow$ 1.2.Psi $\rightarrow$) and organising ($\rightarrow$ 2.As $\rightarrow$ 3.Ss $\rightarrow$ 4.Cs $\rightarrow$) and may be presented by theoretical (strategic) TGCt of an e-system (upper /strategic/ part of Figure 3).

Figure 3: Theoretical (strategic) and practical (operational)
Tauzović's General Continuums (TGCt and TGCp) of an e-system (e-organisation)
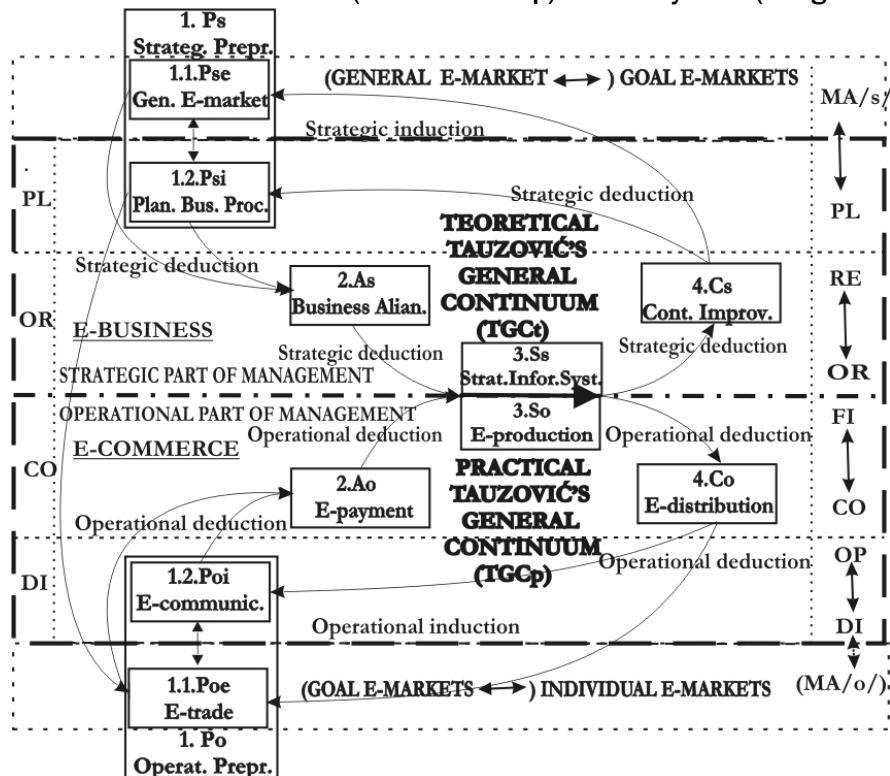
In designing an e-system (e-operations), apart from (i) the activities of (external and internal) preparations, also the (ii) support activities (as strategic inputs), (iii) supply activities (as strategic transformation of inputs into outputs) and (iv) evaluation activities (as strategic outputs) are defined. Special consideration is given to the definition of strategic (activity) of supply as a synthesis of strategic management – strategic information systems (3.Ss) (Figure 3), i.e. total supply the e-system has been designed for. Considering such a supply as strategic, it may be viewed as e-system (e-organisation) supply. By analogous consideration of e-operations performance, the

operational activities of supply, presented by its synthesis – e-production (3.So) (Figure 3), may be viewed also as the production e-system supply. Since the e-system may operationally supply, that is produce (perform) the maximum of what enables the strategic supply (defined by design), then the operational supply (e-production – 3.So) may be considered as a subsystem of strategic supply (which may supply the strategic information system – 3.Ss). Hence, by dividing the total management of an e-system (e-organisation) into its strategic (e-business) and operational (e-commerce) part, shown in Tauzović's General Continuums (TGCt and TGCp) of an e-system (comprehensive e-business /e-organisation/) (Figure 3), it is simpler to present the e-management levels:

1) Institutional (planning with strategic marketing – MA/s/) – planning (re-planning) of business processes.

2) Strategic (organising resources) – business alliances, strategic information systems and continuous improvement.

3) Operational (directing e-operations with operational marketing – MA/o/)) – e-communications.

4) Control (controlling finances) – e-payment, e-production and e-distribution (Figure 3).

The processes of (general) modern management of other types of systems are used for e-system management (total e-business). Figure 3 features mutual influences of synthesis of strategic and operational parts of management – strategic information system and e-production, as parts of supply chain (/added/ values).

Hence, modern management of e-systems may be carried out by using Tauzović's General Continuums (TGCt and TGCp) (Figure 3). By resorting to TGCt, the strategic management is used to design an e-system (e-organisation /e-operations/), while, by resorting to TGCp, operational management is used to determine the production e-system. Strategic management (as an external part of management) is performed by the following process:

$$\{\rightarrow Ps \rightarrow As \rightarrow Ss \rightarrow Cs \rightarrow\}$$

of an e-system design, while operational management (as an integral part of management) is performed by the following process:

$$\{\rightarrow Po \rightarrow Ao \rightarrow So \rightarrow Co \rightarrow\}$$

 of e-product production (Figure 3). Although these two parts of management may be seen separately, e-system (e-organisation) management is performed using the following process:

$$\{\rightarrow Ps \rightarrow As \rightarrow Ss (\rightarrow Cs \rightarrow Ps \rightarrow As \rightarrow Ss) \leftarrow$$

$$\rightarrow (So \rightarrow Co \rightarrow Po \rightarrow Ao) So \rightarrow Co \rightarrow Po \rightarrow\}$$

(Figure 3), where the need to control specific parts of management is indicated in round brackets.

3. OPTIMISATION OF E-SYSTEM (E-ORGANISATION) MANAGEMENT

The procedure of systems (and subsystems) optimisation, including e-system (and e-subsystems/production e-system/), may be formulated in its general form as the totality of the function of criteria F(X) and a set of limitations D, i.e.:

$$(optimum) \ Y = (optimum) \ F(X)$$
$$set \ of \ limitations \ X \epsilon D,$$

where: (i) D is the possible area not depending on variables $X = (x_1,..., x_n)$ and (ii) $Y = (y_1,..., y_m)$ depending on the variable (Tauzović. J. T. 2009). Hence, sets of allowed values of inputs x_i (i=1,...,n) determine the best possible outputs $\hat{y}_j$ (j=1,...,m) essentially based on the use of experi-

mental procedures, simulations procedures, statistical techniques and optimisation-algorithm processes (Tauzović. J. T. 2009). The most frequent methods used in optimisation of e-systems (e-organisation /overall e-business/) are the methods of analytical hierarchy and the multi-criteria comparative ranking, as heuristic approaches based on quality simulation, while in optimisation of e-subsystems (production e-system /e-commerce/) the methods of direct search, generalised gradient, statistical and mathematical programming based on quantity simulation are used. Hence, the optimisation of e-system (e-organisation) based on quality simulation and optimisation of e-subsystem (production e-system) based on quantity simulation yield results giving best possible practical solutions, i.e. compromise optimums (Tauzović, J. T. 2009).

The optimisation model, based on simulation, may be given in the form of modern management methodology as follows: {→1.P – Preparation (1.1.Pe – External: as goals ← → 1.2.Pi – Internal: as possible /management/ activities /of the system strategy/) → 2.A – Simulation: as possible development by inclusion and probability of occurrence of specific activity → 3.S – Optimisation: as values (results) of specific activities obtained through simulation → 4.C – Selection of one activity: as the decision fulfilling the goals →}. Thus, the decision-maker has the goal, assessed results of specific (management) activity in terms of goals and selects one activity to be applied to meet the goal. In this optimisation model: (i) **1.2.Pi** – Internal preparation, **2.A** – Simulation, and **3.S** – Optimisation (as internal processes) form the integral internal or information simulation-optimisation unit (as the totality of internal preparation, analysis and synthesis), and (ii) **1.1.Pe** – External preparation, and **4.C** – Selection of decision constitute the external or management-information unit (as the totality of external preparation and control of the decision made, with the possibility of seeking additional and/or external information). Optimiser may be either the full algorithm procedure or the automated computer programme, or else it may include the combination of the two.

Figure 4: Optimisation of an e-system (e-organisation /e-business/) and its e-subsystems (production e-systems /e-commerce/)
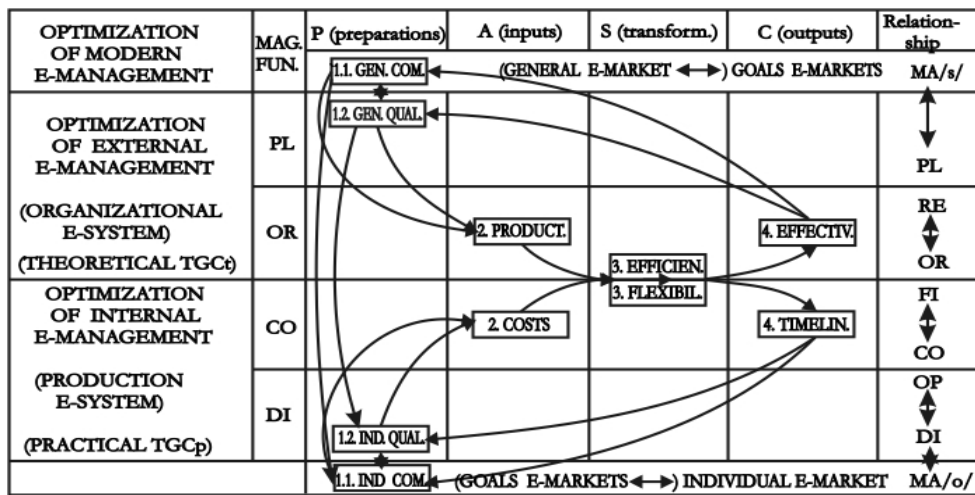
Based on detailed (systems) analyses of specific parts of e-system management it is possible to determine their (systems) synthesis as the basis for decision-making on the existence (and goal) of the e-system (total e-business) and e-subsystems (e-commerce /production e-system/). Determining synthesis, also the goals e-markets are determined where e-products (goods, information, management, services) produced in e-commerce (production e-system) will be distributed. Since the management synthesis determined the (total) e-system, then it should be done via the (compromise) optimisation, firstly, for the strategic part – as e-system (e-organisation) optimisation, then based on such optimisation, or in line with it, determine the (compromise) sub-optimisation of the operational part – as optimisation of e-subsystems (e-

production system) (Figure 4). In short, based on certain optimisation of an e-system (e-organisation /done in the strategic part – e-business/) the optimisation of e-commerce (e-production system /in the operational part/) is determined, usually as the mean value of production optimisations of individual e-products.

Although advance management could have accepted the possibility for both optimisations to use the same evaluation measures (or performances), in modern management it is possible to use different mutually harmonised (analogue) evaluation measures as follows: (i) for optimisation of e-organisation (e-system), i.e. its strategic part, the following measure may be used {→ (1.1. General competitiveness /as organisational/ → ← 1.2. General quality /as organisational/) → 2. Productivity → 3. Efficiency → 4. Effectiveness →} (Tauzović, J. T. 2009), and (ii) for optimisation of an individual e-product (produced in a production e-system, as the operational /e-subsystem/) the following evaluation measures may be used {→ (1.1. Individual competitiveness /of e-products – as particular/ → ← 1.2. Individual quality /of e-product – as particular/) → 2. Costs (of e-product production) → 3. Flexibility (of e-product production) → 4. Timeliness (e-product distribution /delivery/ at particular e-market) →} (Tauzović, J. T. 2000) (Figure 4). As the basis of the e-system (as e-organisation) optimisation, quality (intelligent) simulation may be used (with which /relatively/ much information may be obtained by using a few data), and for determining the optimisation of a production e-system (that is, the mean value of production of all e-products – as e-subsystems) usually the quantity (technical) simulation is used (which provides /relatively/ few information based on a large number of data).

The aim of modern optimisation of an e-system (e-organisation) is usually taken to be (i) maximum productivity (as modern evaluation measures, which may be presented as a ratio of effectiveness and efficiency) based on organisational (general) quality and (ii) determination of conditions for "maximum" possible (required) level of systems (organisational) (general) competitiveness (as the external evaluation measure) of e-system. Since the "dimensions" of (sufficient) general (systems, organisational) competitiveness are usually taken to be: (i) general (organisational – needed) quality (ii) productivity (iii) efficiency and (iv) effectiveness, then optimisation at the same time achieves their optimal values (when for quality only needed is required – the "minimal" value). In order for an e-system (e-organisation) to respond to the optimisation needs in modern management, it needs to be planned and designed based on the general (organisational /strategic/) quality (shown through productivity that considers the strategic benefits of products directed to maximum revenues) in order to measure the related process in a comprehensive manner:

{→ 1.(1.1. "Maximum" (sufficient) general competitiveness →
← 1.2. "Minimal" (needed) general quality) →
→ 2. Maximum productivity → 3. Maximum efficiency →
→ 4. Maximum effectiveness →} (Figure 4).

When it comes to the optimisation of the production e-system or production of individual e-products (production and distribution of e-products) then the optimisation procedure is somewhat different. Based on e-system (e-organisation) optimisation, the optimisation of e-product production achieves the optimal individual (required) (e-product) competitiveness at a individual part of the goals e-market, and its basis is found in the individual (needed) quality shown through (profitability aimed at reduction of) e-costs (e-products). The least costs of e-product production should be defined through the best flexibility and timeliness of e-product delivery at the relevant (individual) part of the goals e-market. Therefore, the optimisation procedure for individual e-products (as the basis for optimisation of the production e-system) may be performed by using the following process:

{→ 1.(1.1. "Maximum" (sufficient) individual competitiveness ←
→ 1.2. "Minimum" (needed) individual quality) → 2. Minimum e-product costs →
→ 3. Maximum e-product flexibility →
→ 4. Maximum timeliness of arrival (distribution) of e-products to the e-market →} (Figure 4).

The processes of optimal e-system management are based on the following: (i) optimal strategic management process – 1.2. planning of general (needed) quality, 2. organising productivity, 3. directing efficiency, and 4. controlling effectiveness in order to attain 1.1. general (sufficient) competitiveness of the e-system at the general e-market and thus determine the goals e-markets, then based on optimal strategic management /optimal e-system design/) determine (ii) the optimal operational management process (optimal e-product production) – 1.2. planning of individual (needed) (e-product) quality, 2. organising (e-product) costs, 3. directing (e-product) flexibility, and 4. controlling (e-product) timeliness, at the individusl e-market, as a part of the goals e-markets, in order to reach 1.1. individual (sufficient) e-product competitiveness.

Hence, determining the optimal modern evaluation measures (performances) for organisational (and their operational) e-systems – quality, productivity, efficiency and effectiveness – their maximally achievable competitiveness is attained (for certain quality aimed at highest revenues), while in optimisation of production e-systems it is possible to effectuate such optimisations (directed at least /e-product/ production costs). Only the e-systems (e-organisations) which base their management on optimisations may be able to base, maintain, add, extend and upgrade their goals e-markets (of business activities), as parts of the (business – general) e-market. By opting for the optimal management of (modern) organisational (operations) e-systems, based on harmonised strategic and operational optimisations, it is ultimately possible to make decisions on the existence (goals) of an e-system (e-organisation) and (finally) implement its decision in management control (at the control level).

5. Conclusion

The development of modern information and communication technologies (ICT), management methodologies and concepts enabled (practical) foundation of electronic commerce (e-commerce) and its (theoretical) modernised development – electronic business (e-business). Given that total partner e-business (two or more organisations, as an e-system /of business/), done via Internet, confirms the validity and extends the applications of modern (innovative) management methodology – Tauzović's General Continuum (TGC), then, using the theoretical TGC (TGCt), an optimal e-system design is possible based on which, using the practical TGC (TGCp), the optimisation of production of individual e-products is determined. It is to be expected that further development of business of modern organisations, particularly the electronic one, will modernise the application of TGC not only in modern systems of total business, but also in other types of future systems.

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