Recursive Management of A Dynamic Business in Global Capital-Investment Markets

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Abstract

The selected principles of Beer's viable system model (VSM) are herein applied to the design of two recursive business-management concepts for managing a dynamic business as a system and its interaction with the targeted global capital-investment markets. Dynamism is perceived to include both static and dynamic businesses that firms find themselves in or (co-)create. (i) Along the organizational dimension, a global business is managed recursively as the first trio of viable systems: a corporation, its global business division, and organizational units (inside this division). The three degrees of highly, semi, and non-recursive global business (system) are defined for self-diagnosis purposes among interested managers. (ii) Along the temporal and cognitive-actionable dimensions, the scope of recursive global business management consists of the second trio: boundaries, models, and operations. The focal 2nd-order system involves the redesign of global business models. Its lower 1st-order recursion involves the same models-in-use, i.e. actually managing global business operations. Its higher 3rd-order recursion deals with the foresight and the boundary-setting issues that precede the business models over time. On an on-going basis, a global business (division) is managed recursively to attain the actual goals, its underlying business logic is being revised, and its boundaries are being reconsidered to anticipate and match major changes. It is proposed that a high degree of recursions is one of the necessary attributes of any concept that turns out to be effective in actually managing a global business.

Keywords: Business management, global construction markets, recursive systems

1. Introduction

Previously, the author has adopted Beer's [1] recursive principles and applied them to **re-conceptualizing the management of a firm** in terms of managing a firm's competitiveness as a set of three recursive competence-based systems [2], managing a firm in capital-investment markets [3], and managing a firm and its project-oriented businesses [4]. In turn, this fourth paper addresses the selected principles of recursive management and calibrates these further to advance business management in the focal context, i.e. capital-investment markets.

Why should one choose Beer's[1] [1] viable system model (VSM) as a frame of reference for approaching global business management? Objectivity implies that independent points of reference and school-free ways should be relied upon when one aims at avoiding major biases inherent in any of eight schools of thought in business management [5]. In many converging ways, systemic nature is, however, required in the cross-disciplinary literature. Several approaches to define an organization (e.g. a multinational corporation) as a dynamic system were identified within the systems literature (e.g. Checkland [6]). However, none concerns primarily the design of a global business-management system. So far, Beer's VSM is considered to fulfill best the need of determining a generic, systemic scope of global business management.

The purpose of this paper is (a) to introduce the wickedness of global business management in the context of capital-investment markets, (b) to apply the selected principles of Beer's viable system model (VSM) to the design of two recursive business-management concepts along the organizational dimension (the first concept) and along the temporal and cognitive-actionable recursive dimensions (the second concept), (c) to enhance the advancement of global business management among key senior scholars, (d) to inform about the further development of the two initial recursive concepts, and (e) to encourage interested global business managers to make a self-diagnosis of the current viability of their global business (divisions as recursive systems), respectively, and to proceed with strategic actions to achieve more sustainable viability in the future.

Global capital-investment markets deal with design, implementation, services, and life-cycle aspects of investments in the utilization of natural resources, energy supply, telecommunications, transportation, other infrastructure, manufacturing, and general building concerns. Capital investments (incl. construction investments) are herein perceived as a primary means to advance economic and social welfare in various countries across the globe.

Dynamism is perceived to include both static and dynamic businesses that firms find themselves in or (co-)create. Dynamism includes the total spectrum of managing a firm's business in static, dynamic, cyclical, hypercompetitive, and even chaotic markets. A population of firms operating in capital investment markets belongs primarily to **seven business-scope groups**: (i) technology-intensive contracting, (ii) construction-related contracting, (iii) process engineering, design, and consulting services, (iv) construction-related design and consulting services, (v) the supply of building products, systems, and materials, (vi) the supply of construction machinery, equipment, and tools as well as (vii) real estate ownership, development, management, and services [7 p. 100-102].

[1] Stafford Beer died in August 2002

2. Wicked Global Business Problems vis-à-vis Management through Three Organizational Recursions

What is the sustainable, intriguing trigger of this paper (and the previous ones)? It lies inherent in the bold way that Rittel and Webber [8] deal with **wicked, planning problems** primarily in the societal context. They posit that governmental, political, or social problems are ill-defined and never solved. At best they are only re-solved – over and over again. They use the term wicked in a meaning akin to that of malignant (in contract to benign), or vicious (like a circle) or tricky or aggressive. In the same vein, it is argued herein that global business managers face frequently wicked problems, indeed. There are at least **ten distinguishing properties** of global business planning-types problems, i.e. wicked ones that managers had better be alert to such as a global business-management problem (i) cannot be formulated definitely, (ii) has no stopping rule, (iii) has only good-or-bad solutions (not true-or-false), (iv) is not testable with a potentially viable solution immediately or ultimately, (v) allows only one-shot-solutions (no opportunity to learn by trial-and-error because every attempt counts significantly), (vi) allows neither an enumerable (or exhaustingly describable) set of potential solutions, nor a well-described set of permissible operations that may be incorporated into a global business plan, (vii) is essentially unique, (viii) is a symptom of another problem, (ix) can be explained in numerous ways and, thus, the choice of explanation determines the nature of a problem's resolution, and (x) provides the global business manager with no right to be wrong (a manager is liable for the consequences of the decisions they make and those of the actions they generate).

In other words, a manager who is trying to manage her or his **open global business system** is caught in the ambiguity of its causal web, i.e. it defies efforts to delineate its boundaries and to identify the causes of most global business problems and thus to expose their more or less wicked nature. In turn, Beer [1 p. xiii] emphasizes that one of the main reasons why so many [global business] problems are intractable, is that they are formulated in such a way as to defeat any solution. Thus, many global business managers typically go on trying the solutions that have always failed to work in the past, instead of attempting to pose the business problems in a different and solvable way. In the case of China, there are multinational companies that fail to take advantage of local resources, preferring instead to stick to a global formula and running the risk of creating uneconomic cost structures. In some industries, the use of local equipment, design, and construction firms allows the Chinese to build factories and install machinery for just 30-50 % of what their foreign rivals would pay. Similarly, multinationals can benefit from China's unrivalled potential as a global sourcing center. General Electric, for example, has more than 300 purchasing agents in the country who certify suppliers for global sourcing. The company's stated goal was to have USD 5 billion in Chinese sales and to source USD 5 billion worth of products in China already in the year 2005 [9].

In turn, Beer [1 pp. 1-17] suggests that global business (and corporate) managers use his **Viable System Model (VSM)** to design and manage a viable business system, which can survive in its global environment. In particular, **recursiveness** is offered as one of the key principles of management for dealing successfully with wicked global business problems. In practice, the first plan is to consider a trio of viable systems at any one time along the organizational recursive

dimension: one focal global business division (the 2nd-order system), the corporation within which it is contained (one level of recursion up, the 3rd-order system), and the set of organizational units contained and linked by this division (one level of recursion down, the 1st-order system). Herein, **the first business-management concept** is designed for managing a business (division) in global capital-investment markets as a recursive system with its basic attributes as follows:

- A full variety of the external states of a global capital-investment market type or a business type (based on capital investments) is allowed and the necessary and the sufficient conditions of success are redefined.

- Global business division co-defines its purpose and co-sets its goals (as governed by the corporate management).

- A network of globally-linked organizational units co-defines its integrated purpose and co-sets its goals (as guided by the global business management).

- All major parts (e.g. global business processes, operations, geographical units, profit centres, or competitiveness platforms) are designed as (sub)systems and their elements. At each level, all the subsystems and elements are coordinated and constrained for generating resource usage and synergy. Resources involve also all the core technologies, offerings, competences, and knowledge.

- (Self-)control between the three kinds of systems, i.e. the corporate management, the global business division, and its organizational parts is designed to enable both the cohesive management (top-down) and the actions of autonomous (sub-)systems (bottom-up).

- Market-related feedback loops are defined to allow pre-emptive, proactive, and reactive decisions and actions at each level.

- Each organizational unit is capable of responding to (un)known events that are likely to take the unit's states and outcomes out of the targeted path.

It is proposed herein that **a high degree of organizational recursions** is one of the necessary attributes of any concept to be applicable for actually managing a global business successfully. Thus, the three degrees of a highly, semi, and non-recursive business management (system) are defined next in order to enable interested global business managers to proceed with the self-diagnosis of their current degrees of organizational recursions, respectively (Table 1).

Table 1: Three degrees of a recursive global business division (as a system) in the context of global capital-investment markets.

Degree	Systemic, recursive attributes of global business management
HIGHLY RECURSIVE BUSINESS SYSTEM	• A full variety of the external states of a market (business) type is allowed and the necessary and the sufficient conditions of success are redefined. • Global business division co-defines its purpose and co-sets its goals. • Each organizational unit co-defines its purpose and co-sets its goals. • All major parts are designed as (sub)systems. At each level, all the subsystems and elements are coordinated and constrained for generating resource (e.g. technologies, competences, knowledge) usage and synergy. • (Self-)control between the three systems is designed to enable both the cohesive management (top-down) and the actions of autonomous (sub-) system (bottom-up). • Market-related feedback loops are defined to allow pre-emptive, proactive, and reactive decisions and actions at each level. • Each unit is capable of responding to (un)known events that are likely to take the unit's states and outcomes out of the targeted path.
SEMI-RECURSIVE BUSINESS SYSTEM	• Only the typical external state(s) and conditions of success inherent in a market type (business type) are considered. • Global business division and/or its organizational units are not allowed to participate in defining the purposes or setting the goals for them. • Mistakes in articulating one of the three levels of recursion. • A designed attribute prevents the unit from acting as a recursive system. • One subsystem (part) is designed to show a predominant concern with its own interests rather than with the success of the division/unit as a whole. • Only the primary states (elements) are designed as sub-systems (constructs). • Interdependent relations are designed only between the primary elements. • Only one-level feedback loops are defined to allow reactive behavior.
NON-RECURSIVE BUSINESS SYSTEM	• No consideration of external states and the conditions of success inherent in a market type (business type) • Premises, purposes, and goals of a global business division are given. • Structure contains no recursive features. • Given attributes prevent the division from acting as a recursive system. • Many subsystems are designed to show a predominant concern with their own interests rather than with the success of the division as a whole. • States (elements) are defined as single entities, factors (or variables). • Only some or no interdependent relations are designed. • Only some or no feedback loops are defined.

3. Global Business Management through Temporal and Cognitive-Actionable Recursions

As Beer [1 p. 6] reminds managers, a global business (division) may have more than one next higher and next lower recursion. A recursion may deal both with an existing global business or the new one to be developed as well as their various states and stages. Herein, **the second**

business-management concept for managing a business in global capital-investment markets is first designed along the temporal recursive dimension. Thereafter, the initial concept is specified further along the cognitive-actionable recursive dimension as a set of three systems: global business boundaries, models, and operations vis-à-vis foreseen, desired, and targeted capital-investment markets.

3.1 Managing through Three Temporal Recursions

A global business system, its environment, and their interaction are herein defined in the context of capital-investment markets along the temporal dimension. In other words, **the scope of global business management** is defined on the 1st-order real-time plane, the 2nd-order design plane, and the 3rd-order foresight plane as follows (Figure 1):

- System environment consists of (i) the well-known, globally targeted capital-investment markets with the conditions of success, (ii) desired future markets and the conditions of success, and (iii) the foreseen varieties of the same.

- System-environment interaction consists of (i) the (non-)attained, targeted outcomes of the actual firm-market interaction in the global capital-investment markets, (ii) the desired outcomes of the planned firm-market interaction, and (iii) the foreseen varieties of the same.

- First subsystem of a global business system consists of competitive elements: (i) re-executed ways of competing, competitive strategies, offerings, and client relationships, (ii) redesigned models of the same, and (iii) foreseen varieties of competition and competitive models.

- Second subsystem of a global business system consists of operational elements: (i) releveraged ways of performing, competitive advantages, and global business processes, (ii) redesigned process models of the same, and (iii) foreseen varieties of global business operations and process models.

- Third subsystem of a global business system consists of self-renewal, core elements: (i) ways of rebuilding the global competitiveness, e.g. core technologies, competences, and knowledge as well as their actual states, (ii) ways of redesigning the viable competitiveness and rebuilding models, and (iii) ways of foreseeing the varieties of competitiveness and related models.

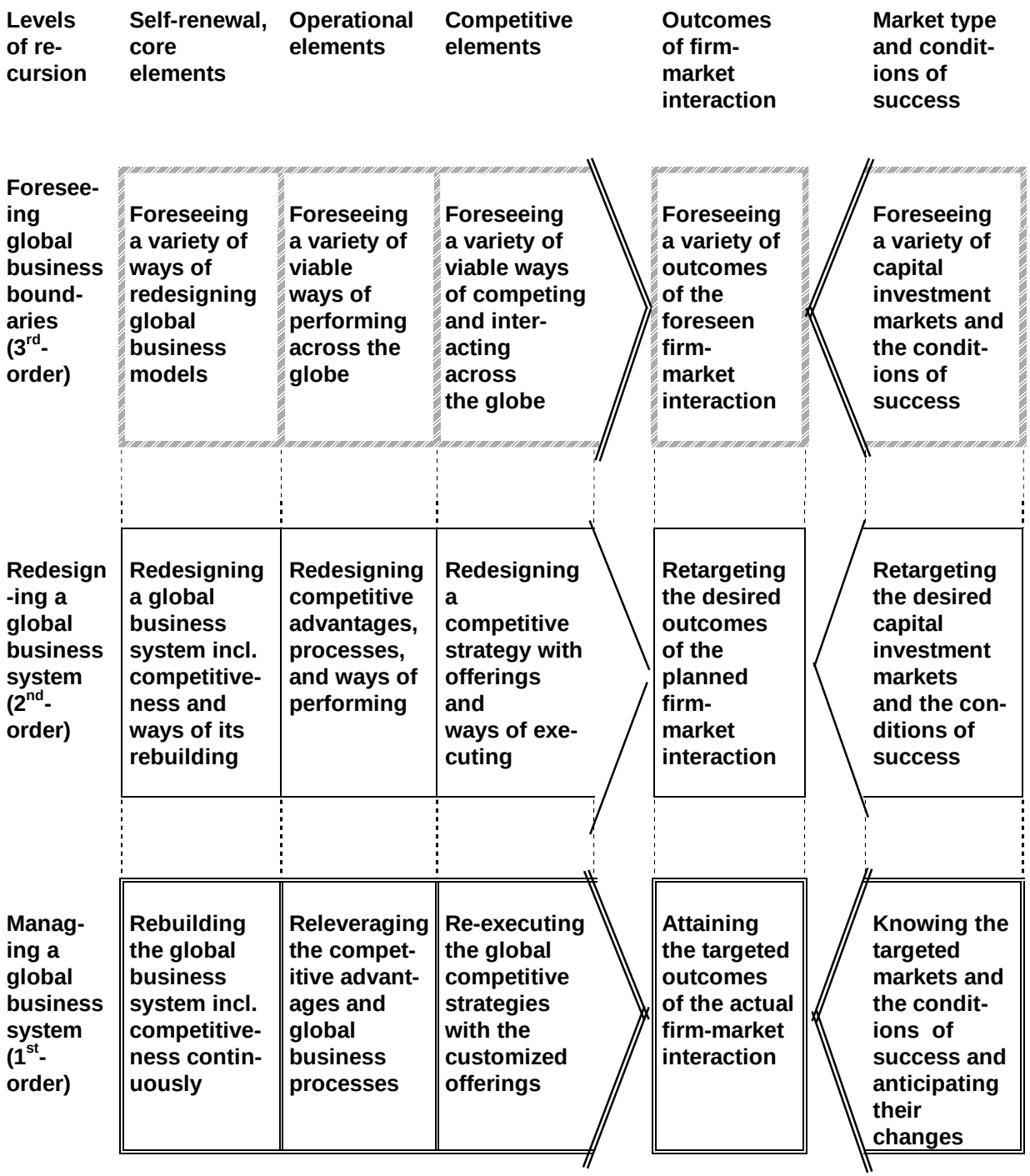

Figure 1: Scope of recursive global business management in terms of three systems (consisting of the systems themselves, the related global capital-investment markets as environments, and the outcomes of firm-market interaction).

3.2 Managing Global Business Operations (1st-Order System)

It is proposed herein that **a firm's near-term global business success** can be managed in the targeted capital-investment markets, i.e. the global business-specific objectives and other targeted outcomes of the actual firm-market interaction are attained only by performing global business operations more effectively than global and local competitors do. In turn, superior operational effectiveness can be achieved through managing the 1st-order subsystems in the integrated proactive ways: by knowing the attractive clients versus the strongest competitors with the global and local conditions of success and anticipating their changes as well as re-executing the competitive strategies and re-offering the best customized offerings to the targeted clients, releveraging the global and local business processes based on the competitive advantages, and rebuilding the elements of the global business (incl. competitiveness) system. All the 1st-order elements need to be leveraged concurrently, which is illustrated in Figure 2.

In particular, a firm's near-term success requires that global business operations management is competent enough to close **global and local performance gaps**, i.e. major differences between the desired states of the 1st-order subsystems leading towards the objective-attainment and the actual, predicted, or anticipated states under conduct. Performance-gap closing takes place through reactive and proactive actions in the contexts of on-going global and local operations and contracts. Herein, Beer's [1 p. 9] notion on managing **high stability** (homeostasis) inside a global business division (and its organizational units), despite the division having to cope with unpredictable global capital-investment markets, appears to be one of the prerequisites for the objective-attainment.

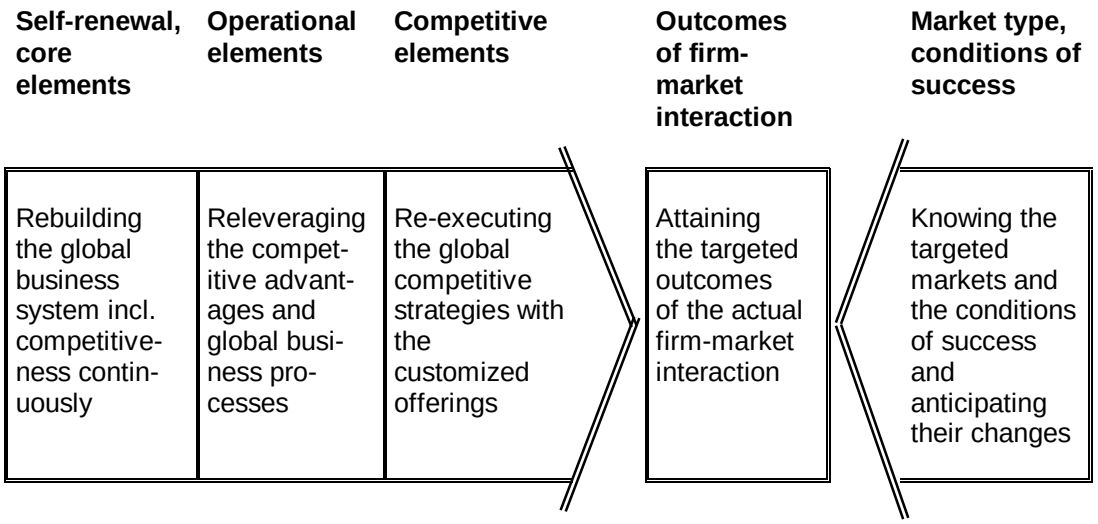

Figure 2: Managing global business operations (as the 1st-order system) in the targeted global capital-investment markets.

It is proposed herein that **a firm's global long-term competitiveness** can be ensured in the desired capital-investment markets ex ante, i.e. the global business goals and the other desired outcomes of future firm-market interaction will be attained only by redesigning better global business (incl. competitiveness) models than the anticipated global and local competitors will do. In turn, superior global business models will be redesigned through managing the 2nd-order subsystems in increasingly networked ways: by retargeting the most desired capital-investment markets according to changing conditions of creating value networks and capturing the best value both for the clients and other networked stakeholders as well as redesigning the anticipated set of competitive, offering, advantage, process, business system, and competitiveness models. All these 2nd-order elements need to be redesigned concurrently, which is illustrated in Figure 3.

In particular, a firm's long-term competitiveness requires that global business models management is competent enough to close **global and local competitiveness gaps**, i.e. differences between the desired states of the 2nd-order subsystems leading towards the goal-attainment and the designed, predicted, or anticipated states of the desired capital-investment markets with the conditions of success and those of a set of global business models. On a design plane, competitiveness-gap closing takes place through proactive redesigns of the existing and new global business models in the context of the focal global business as well as its desired markets and stakeholders. Herein, Beer's [1 p. 17] notion of incorporating **a minimum set of invariants** into global business models appears to be one of the prerequisites for high global competitiveness. Invariants such as core technologies, core competences, and tacit knowledge are unaffected by most of changes surrounding them.

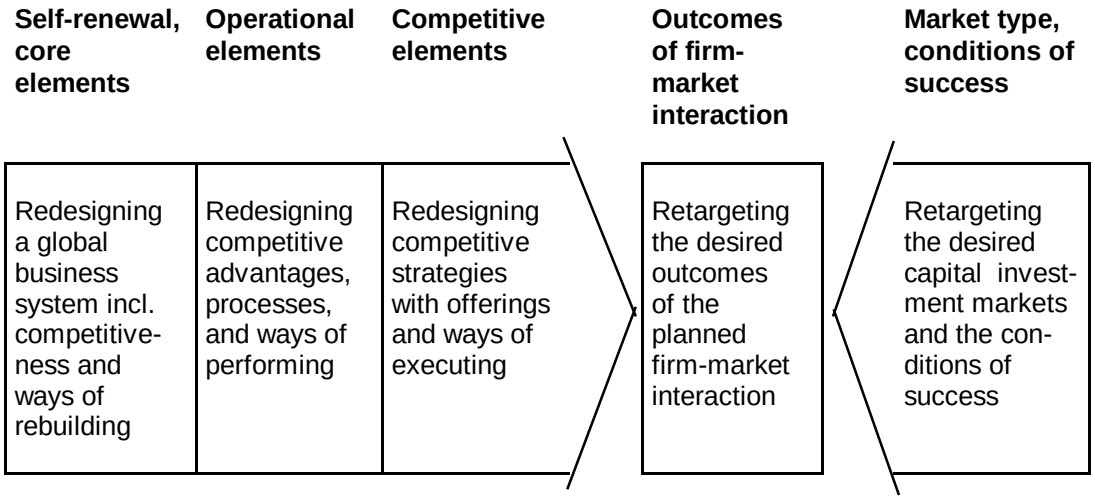

Figure 3: Redesigning global business and competitiveness models (as the 2nd-order focal system) for planned operations in the desired global investment markets.

3.3 Foreseeing Global Business Boundaries (3rd-Order System)

It is proposed herein that **the existence of a global business (division)** can be sustained within the plausible variety of future capital-investment markets ex ante, i.e. the existential business goals and many other positive outcomes of the firm-market interaction will be attained only by foreseeing each of these five interrelated varieties before and even in more new future business-creating ways than any of (non-)expected competitors will do. In turn, the sustainable existence of the global business division will be foreseen and re-created through managing the 3rd-order boundary-setting subsystems: by making tradeoffs in choosing (and not choosing) to invest in supporting or creating the desired variety and types of future capital-investment markets as well as in advancing the known ways and/or creating the new ways of competing with global and local competitors, caring global and local clients, performing the business processes across the globe as well as redesigning and rebuilding the various (non-)existing global business and competitiveness models. All these 3rd-order elements need to be foreseen and addressed concurrently, which is illustrated in Figure 4.

In particular, the existence of a global business (division) requires that global business boundaries management is competent enough to close **global and local boundary gaps**, i.e. differences between the desired states of the 3rd-order subsystems leading towards the sustained existence and the foreseen varieties of both the future capital-investment markets with the conditions of success and a set of future models. Boundary-gap closing takes place through managing the foreseen varieties of future global markets, business models, and competitiveness. Herein, **the application of Ashby's law** [1 p. 35] seems to be one of the prerequisites for the sustained existence, i.e. future operation, model, and market varieties should be foreseen, coupled, and designed to equate to maximal extents and with minimal damages to future competitiveness and success.

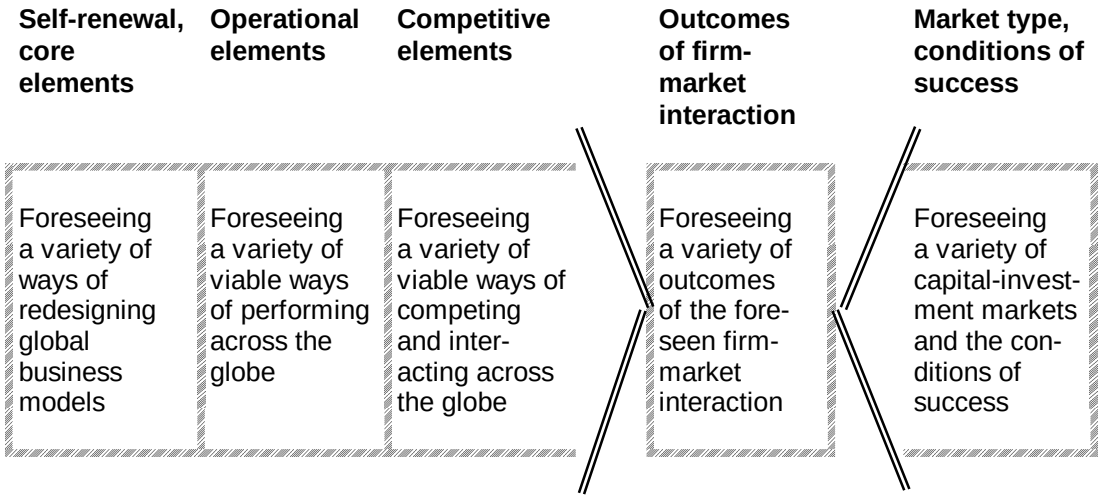

Figure 4: Foreseeing the varieties of business boundaries (as the 3rd-order system) for the three viable business systems in the context of conditioned global capital-investment markets.

4. Conclusions

Previously, the author has also exposed that no established tradition exists in construction-related business-management research [5, 10]. The identified population consists of 38 business-management concepts published between the years 1990-2002. Moreover, many of these concepts are not directly applicable to actually managing a dynamic business in global capital (including construction) investment markets. Thus, it is repeated herein that the key senior scholars within the four related fields of engineering sciences, i.e. construction economics and management, real estate management, project management, and industrial management would develop new effective global business-management concepts in the future.

In turn, this paper is part of the on-going study on new recursive and competence-based ways of managing firms and their businesses successfully in global capital-investment markets. Next, the author will define and incorporate a firm's competences in global business management into the two recursive business-management concepts. The two generic concepts will be calibrated to match particularities inherent in global capital-investment markets. Thereafter, the applicability of the calibrated concepts to managing a dynamic business in global capital-investment markets will be tested among the selected Finland-based firms. Finally, the guidelines and the prerequisites for the adoption of any recursive, competence-based concept among practicing global business managers will be specified in detail.

In the meantime, each interested global business manager is encouraged to start with the initial self-diagnosis of the viability of her or his global business as a trio of (a) recursive organizational systems, (b) recursive temporal systems, and/or (c) recursive cognitive-actionable systems. The purpose of this diagnosis is to assess the current degrees of the enabling recursions inside the existing global business (division, i.e. three systems) and to proceed with foreseeing its future boundaries and redesigning the division accordingly in order to survive in desired global capital-investment markets.

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