AN EVALUATION OF GAME THEORY WITH THE VALUE CLUSTER MODEL IN LOGISTICS SERVICE PROVIDERS

by

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ABSTRACT

This chapter presents a proposed the Value Cluster Model in Logistics Service Providers with Game Theory. It is an attempt to develop a new model to support a theory of partners' model and game theory model, in accompanied with various supporting concepts such as transportation, freight transportation, distribution, warehouse, custom procedure, and sourcing defined by this thesis. A process of developing, rationale behind, and explanation of the components on the model are described. The model has been developed throughout the period of this research study, and its components focus on the context of value cluster in logistics service providers as independent variables that reflect dependent variables used in an exemplary case study. The last section is a review and brief conclusion of the model.

KEYWORDS
Mutual Benefit, Logistics Service Providers, Cluster, Game Theory

INTRODUCTION

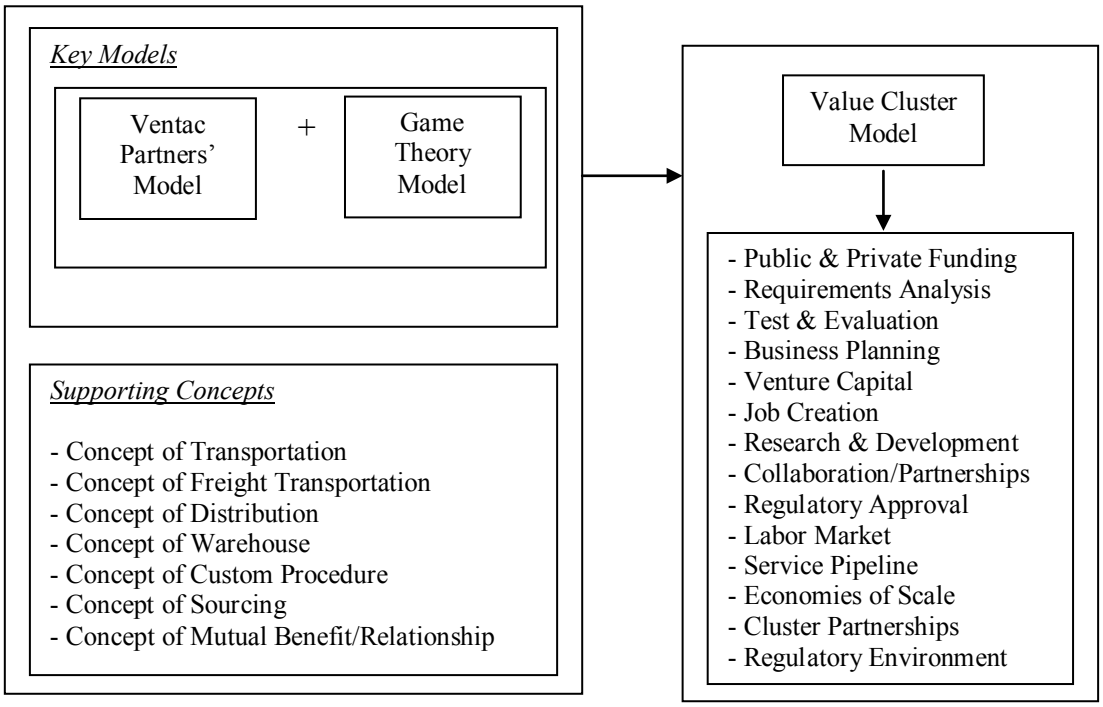
In an attempt to define a new theory of the value cluster model in logistics service providers in compatible with game theory, it is essential to develop some models that can support the validation of the theory presented. This chapter, therefore, proposes a model of the value cluster model of the relationship between logistics service providers. The aims of the model are: 1) to present an overview of previous suggestions regarding the relationship between logistics service providers in light of mutual benefit, relationship, and satisfaction; 2) to provide a basis for developing the value cluster model in logistics service providers measurements using game theory to be used in research methodology; and 3) to direct topics for empirical study within this study.

This model was derived by considering previous independent models of supply chain, transportation, freight, warehouse, mutual benefit, mutual relationship, mutual satisfaction, and game theory. When developing this model, a number of research sources were reviewed.

PROCESS OF DEVELOPING THE MODEL

The model developed in this research study is named as "the Value Cluster Model in Logistics Service Providers with Game Theory". Figure 1 shows the logic of the process of development. The process started from a concept based on previous models and identified the factors used for cluster value concepts such as mutual benefit, relationship, and satisfaction of logistics service providers.

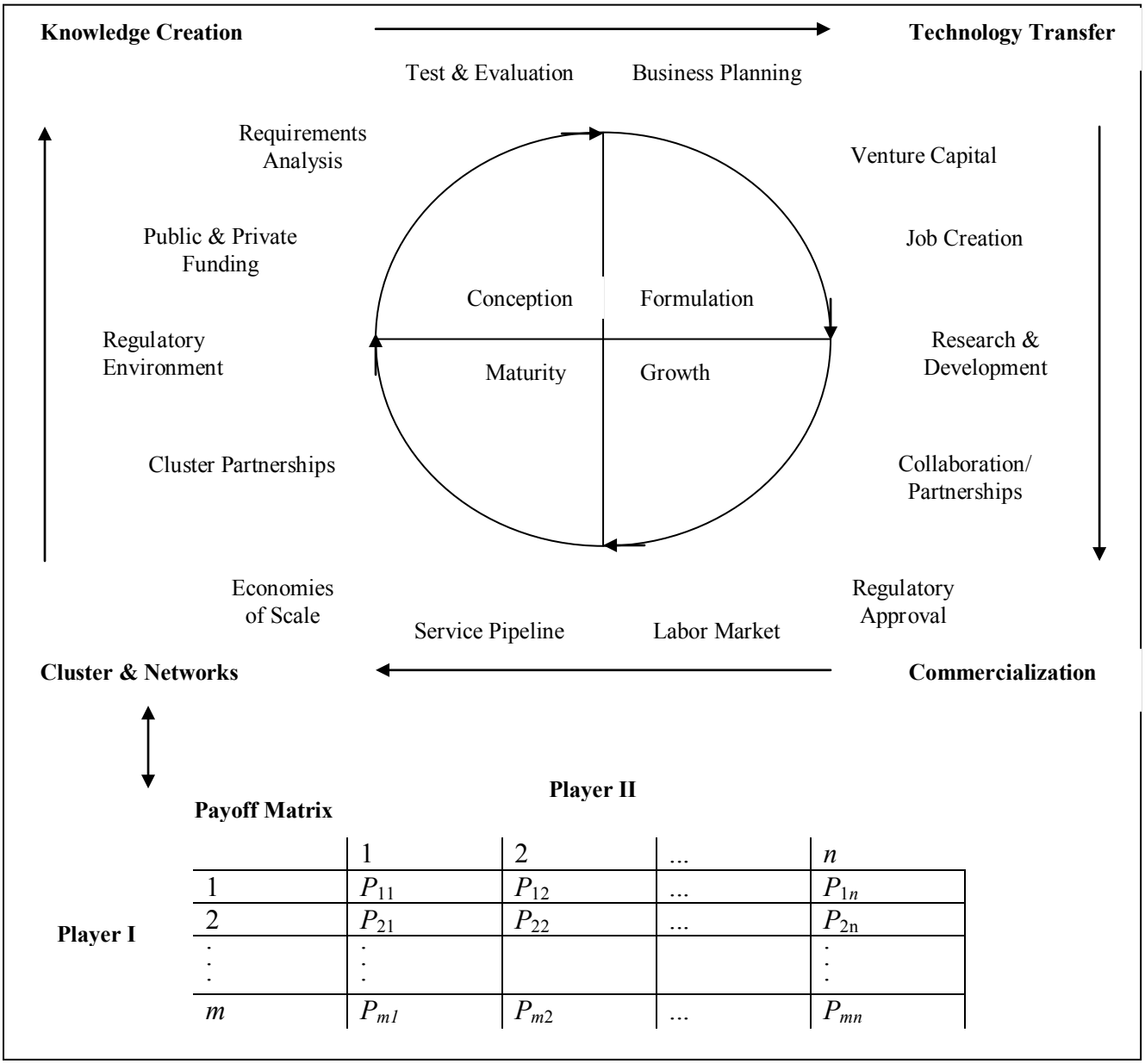
FIGURE 1
DEVELOPMENT OF THE MODEL



DEVELOPMENT OF THE MODEL

This model was mainly based on the Value cluster (Ventac Partners, 2011) is value proposition consisting of a cluster of composed of three parts: choice of target customer segments, particular focal combination of customer-driven benefits, and rational for why this firm and its partners can deliver the value cluster in a significantly better way than competitors. Therefore, the firm can serve multiple groups of customers with different value propositions. Another model is based on the Game Theory models proposed by several economists and philosophers such as Aumann, R.J. and Shapley, L.S. (1974); Cournot, A. Augustin (1838); Edgeworth, Francis Y. (1881); Farquharson, Robin (1969); Luce, R. Duncan; Raiffa, Howard (1957); R. Duncan Luce ; Howard Raiffa (1989); Maynard Smith, John (1982); Maynard Smith, John; Price, George R. (1973); Nash, John (1950); Shapley, L. S. (1953); Shapley, L. S. (1953); von Neumann, John (1928); and Zermelo, Ernst (1913). However, the independent models mentioned earlier were described and intended to provide general ideas of the relationship between each factor, and to support a conceptual framework of the Cluster Value Model in Logistics Service Providers. Therefore, this research proposes a model of value cluster that may help logistics service providers to effectively manage their operation and business illustrated in Figure 2.

FIGURE 2
VALUE CLUSTER MODEL IN LOGISTICS SERVICE PROVIDERS WITH GAME THEORY



Player II

Payoff Matrix

Player I	1	2	...	*n*
1	P_{11}	P_{12}	...	P_{1n}
2	P_{21}	P_{22}	...	P_{2n}
. . .	. . .			. . .
m	P_{m1}	P_{m2}	...	P_{mn}

DESCRIPTION OF THE COMPONENTS ON THE MODEL

Internal Factors

Public & Private Funding

The public Fund is used to account for education activities, district instructional and student support programs, general and administration expenditures, normal operations and maintenance, and state approved school district expenditures not specifically designated to be accounted for in any other fund. On the other hand, private funding is from a particular company who has decided to fund a project or an event. You see that with athletes and race car drivers a lot. Those private companies are supporting them. The person may have more than one company or person supporting them at a time and usually those companies advertise someway like with their names on the cars.

Requirements Analysis

Requirements analysis in systems engineering and software engineering, encompasses those tasks that go into determining the needs or conditions to meet for a new or altered product, taking account of the possibly conflicting requirements of the various stakeholders, such as beneficiaries or users. It is an early stage in the more general activity of requirements engineering which encompasses all activities concerned with eliciting, analyzing, documenting, validating and managing software or system requirements. Requirements analysis is critical to the success of a systems or software project. The requirements should be documented, actionable, measurable, testable, traceable, related to identified business needs or opportunities, and defined to a level of detail sufficient for system design.

Test and Evaluation

Test and Evaluation is the process by which a system or components are compared against requirements and specifications through testing. The results are evaluated to assess progress of design, performance, supportability, etc. Developmental test and evaluation is an engineering tool used to reduce risk throughout the defense acquisition cycle. Operational test and evaluation is the actual or simulated employment, by typical users, of a system under realistic operational conditions.

Business Planning

A business plan is a formal statement of a set of business goals, the reasons they are believed attainable, and the plan for reaching those goals. It may also contain background information about the organization or team attempting to reach those goals. Business plans may also target changes in perception and branding by the customer, client, taxpayer, or larger community. When the existing business is to assume a major change or when planning a new venture, a 3 to 5 year business plan is required, since investors will look for their annual return in that timeframe.

Venture Capital

Venture capital (VC) is financial capital provided to early-stage, high-potential, high risk, growth startup companies. The venture capital fund makes money by owning equity in the companies it invests in, which usually have a novel technology or business model in high technology industries, such as biotechnology, IT, software, etc. The typical venture capital investment occurs after the seed funding round as growth funding round (also referred to as Series A round) in the interest of generating a return through an eventual realization event, such as an IPO or trade sale of the company. Venture capital is a subset of private equity. Therefore, all venture capital is private equity, but not all private equity is venture capital.

Job Creation

Job creation programs are programs or projects undertaken by a government of a nation to assist unemployed members of the population in securing employment. A cornerstone of Keynesian economics, they are especially common during time of high unemployment. They may either concentrate on macroeconomic policy in order to increase the supply of jobs, or create more efficient means to pair employment seekers with their prospective employers.

Research and Development

The term R&D or research and development refers to a specific group of activities within a business. The activities that are classified as R&D differ from company to company, but there are two primary models. In one model, the primary function of an R&D group is to develop new products; in the other model, the primary function of an R&D group is to discover and create new knowledge about scientific and technological topics for the purpose of uncovering and enabling development of valuable new products, processes, and services. Under both models, R&D differs from the vast majority of a company's activities which are intended to yield nearly immediate profit or immediate improvements in operations and involve little uncertainty as to the return on investment (ROI). The first model of R&D is generally staffed by engineers while the second model may be staffed with industrial scientists. R&D activities are carried out by corporate or governmental entities.

Collaboration/Partnerships

Collaboration is working together to achieve a goal. It is a recursive process where two or more people or organizations work together to realize shared goals, (this is more than the intersection of common goals seen in co-operative ventures, but a deep, collective, determination to reach an identical objective - for example, an

intriguing[improper synthesis?] endeavor that is creative in nature - by sharing knowledge, learning and building consensus. Most collaboration requires leadership, although the form of leadership can be social within a decentralized and egalitarian group. In particular, teams that work collaboratively can obtain greater resources, recognition and reward when facing competition for finite resources. Collaboration is also present in opposing goals exhibiting the notion of adversarial collaboration, though this is not a common case for using the word.

Partnerships exist within, and across, sectors. Non-profit, religious, and political organizations may partner together to increase the likelihood of each achieving their mission and to amplify their reach. In what is usually called an alliance, governments may partner to achieve their national interests, sometimes against allied governments who hold contrary interests. In education, accrediting agencies increasingly evaluate schools by the level and quality of their partnerships with other schools and a variety of other entities across societal sectors. Partnerships also occur at personal levels, such as when two or more individuals agree to domicile together, while other partnerships are not only personal but private, known only to the involved parties.

Regulatory Approval

Written consent by a regulatory body to proceed with a requested activity, without in any way diminishing the applicant's obligation to meet the standard or specified requirements. Approval may take the form of certification, licensing, or registration, and is sometimes used as an alternative term for authorization.

Labor Market

Labor markets may be local or national (even international) in their scope and are made up of smaller, interacting labor markets for different qualifications, skills, and geographical locations. They depend on exchange of information between employers and job seekers about wage rates, conditions of employment, level of competition, and job location.

Service Pipeline

The nominal market in which workers find paying work, employers find willing workers, and wage rates are determined. Service Pipeline is the concept that defines the variety of services that are currently under development in the service portfolio. The service pipeline is a futures based concept that defines the strategic future direction for the service provider. As part of the entire Service Portfolio, services are taken from the pipeline and put into the service catalog. The Service Transition phases these pipeline services into operation. The pipeline is a good indicator on the overall health of the service provider, as it shows the services that are under development for customers or markets.

Economies of Scale

In microeconomics, economies of scale are the cost advantages that an enterprise obtains due to expansion. There are factors that cause a producer’s average cost per unit to fall as the scale of output is increased. "Economies of scale" is a long run concept and refers to reductions in unit cost as the size of a facility and the usage levels of other inputs increase. More simply put, when more goods can be produced on a larger scale with lower costs, economies of scale is said to be achieved. The economic concept dates back to Adam Smith and the idea of obtaining larger production returns through the use of division of labor. Diseconomies of scale is the opposite.

Cluster Partnerships

A small group of partnerships presents the involved parties with special challenges that must be navigated unto agreement. Overarching goals, levels of give-and-take, areas of responsibility, lines of authority and succession, how success is evaluated and distributed, and often a variety of other factors must all be negotiated. Once agreement is reached, the partnership is typically enforceable by civil law, especially if well documented. Partners who wish to make their agreement affirmatively explicit and enforceable typically draw up Articles of Partnership. It is common for information about formally partnered entities to be made public, such as through a press release, a newspaper ad, or public records laws.

Regulatory Environment

A regulatory environment consists of laws and regulations that have been developed by federal, state, and local governments in order to exert control over business practices.

External Factors

Knowledge Creation

Formation of new ideas through interactions between explicit and tacit knowledge in individual human minds. As defined by Ikujiro Nonaka, it consists of socialization (tacit to tacit), externalization (tacit to explicit), combination (explicit to explicit), and internalization (explicit to tacit).

Technology Transfer

Technology Transfer also called Transfer of Technology (TOT) and Technology Commercialisation, is the process of transferring skills, knowledge, technologies, methods of manufacturing, samples of manufacturing and facilities among governments or universities and other institutions to ensure that scientific and technological developments are accessible to a wider range of users who can then further develop and exploit the technology into new products, processes, applications, materials or services. It is closely related to (and may arguably be considered a subset of) knowledge transfer. Some also consider technology transfer as a process of moving promising research topics into a level of maturity ready for bulk manufacturing or production. Technology brokers are people who discovered how to bridge the disparate worlds and apply scientific concepts or processes to new situations or circumstances.[1] A related term, used almost synonymously, is "technology valorisation". While conceptually the practice has been utilized for many years (in ancient times, Archimedes was notable for applying science to practical problems), the present-day volume of research, combined with high-profile failures at Xerox PARC and elsewhere, has led to a focus on the process itself.

Commercialization

The process or cycle of introducing a new product or production method into the market. The actual launch of a new product is the final stage of new product development, and the one where the most money will have to be spent for advertising, sales promotion, and other marketing efforts. Commercialization is often confused with sales, marketing or business development. The Commercialization process has three key aspects: 1) the funnel. It is essential to look at many ideas to get one or two products or businesses that can be sustained long-term, 2) it is a stage-wise process and each stage has its own key goals and milestones, and 3) it is vital to involve key stakeholders early, including customers

Cluster & Networks

Clusters are geographically close groups of interconnected companies and associated institutions in a particular field, linked by common technologies and skills. They normally exist within a geographic area where ease of communication, logistics and personal interaction is possible. Clusters are normally concentrated in regions and sometimes in a single town. However, personal network is a set of human contacts known to an individual, with whom that individual would expect to interact at intervals to support a given set of activities. Personal networks are intended to be mutually beneficial–extending the concept of teamwork beyond the immediate peer group. The term is usually encountered in the workplace, though it could apply equally to other pursuits outside work. Personal networking is the practice of developing and maintaining a personal network, which is usually undertaken over an extended period.

Payoff Matrix

A payoff matrix is a decision analysis tool that summarizes pros and cons of a decision in a tabular form. It lists payoffs (negative or positive returns) associated with all possible combinations of alternative actions (under the decision maker's control) and external conditions (not under decision maker's control). The Payoff Matrix is an expression of the First Law of Decision Science. Each row represents one action that the decision maker might or might not freely choose to perform; Each column represents a possible state of nature. At the time the decision must be made the decision maker assumes that one of the columns represents the actual decision situation, but her or she does not know which column is the correct one. The cells of the matrix represent payoffs that the decision maker would receive if he or she chose the action represented by a particular row and the actual state of nature were the one represented by a particular column.

DISCUSSION

The proposed model presented here provides an overview of the value cluster model of logistics service providers by considering mutual benefit, mutual relationship, and mutual satisfaction with game theory. These relations between variables will be examined in the exemplary case study, and any results will be further discussed to re-develop this integrated model. It should, however, be noted that this model should not be considered as a definitive method of the

value cluster developed for all parties of logistics service providers. It seems that previous research has not yet defined such a method. This theoretical method is an initial attempt, which will be revised in the discussion of this thesis. The aim of the method development is to ensure that it may be used as a measurement of mutual benefit, mutual relationship, and mutual satisfaction.

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