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**MODELING OUTSOURCING AND STRATEGY ALIGNMENT INTO A
BUSINESS GAME**

Victor Perotti
Rochester Institute of Technology
vperotti@saunders.rit.edu

Thomas Pray
Rochester Institute of Technology
tpray@saunders.rit.edu

Don Wilson
Rochester Institute of Technology
dwilson@saunders.rit.edu

ABSTRACT

This paper introduces a conceptual framework for modeling outsourcing into business games. A review of the Simulation and Games and ABSEL literature reveals that virtually no work has been done in the area of modeling outsourcing concepts into business games. The paper, while being preliminary, (i) briefly reviews the trends in outsourcing, (ii) summarizes a theoretical back for outsourcing, (iii) presents some possible outsourcing options, (iv) develops a framework for linking outsourcing possibilities to a team's general business strategy. The paper concludes with a brief simulated illustration. The primary purpose of the paper is start a discussion on outsourcing and its role in business games.

INTRODUCTION

A 2004 Gartner Group research report estimates that more than 80 percent of U.S. executive boardrooms will have discussed offshore sourcing and more than 40 percent of U.S. enterprises will have completed some type of offshore sourcing projects. From the point of view of U.S. workers, offshore outsourcing appears to be a serious threat to the domestic job market. An estimated 3.3 million U.S. jobs will move overseas by 2015 (Forrester Research). Many people are outraged by competition from overseas labor markets. Politicians are pushing to restrict off-shoring. But the reality is that we can't stop off-shoring. Offshore outsourcing is inevitable and might even be beneficial to the U.S. economy. McKinsey Global Institute calculated that for every dollar spent on a business process outsourced overseas, the U.S. economy gains at least \$1.12.

In the February 2005 issue of *Harvard Business Review* entitled "Strategic Sourcing from Periphery to the Core," Gottfredson, Puryear and Phillips noted:

"Outsourcing is becoming so sophisticated that core functions like engineering, R&D, manufacturing and marketing can – often should – be moved outside. And that in turn is changing the way firms think about their organizations, their value chains, and their competitive positions...."

Outsourcing has become strategic – yet many executives remain unprepared. A new era capability sourcing will trigger organization redesign and require a new set of managerial skills."

Outsourcing is becoming a key strategic decision. As academics we need to prepare our business graduates with an appreciation for outsourcing issues. One method is to utilize a strategy-oriented business simulation that embodies some of the principle issues and tradeoffs that companies face when deciding on outsourcing. A review of the business simulation literature has shown that no current business games seriously address the issue of outsourcing.

OUTSOURCING BACKGROUND

Outsourcing is usually associated with "make" versus "buy" decisions, or what activities should be performed within the firm and what activities could best be performed outside the firm. Some firms may decide to make themselves many or all of the inputs required for a product, an approach known as vertical integration. Other firms may decide to purchase many or all of their inputs using market mechanisms such as contracts or long term purchase agreements, an approach known as outsourcing. Outsourcing occurs when a firm decides to purchase an input or other value chain activity from an external supplier. Outsourcing some activities can be an effective option for

firms since most organizations do not possess the resources and capabilities needed to excel in all value chain activities. However, too much outsourcing can result in a firm “hollowing-out” its internal skills and capabilities, eventually losing the skills and resources needed to perform that activity themselves. Thus, extensive outsourcing may result in a firm becoming increasingly dependent upon their suppliers.

The extent to which a firm pursues outsourcing opportunities may depend partly upon that firm’s business-level strategy. A firm would normally outsource one or more of its value chain activities in order to lower its cost, or to improve its differentiation so it could charge a premium price for its products or services. Cost reductions usually occur when a labor intensive process is performed in a country with low labor rates, or when a specialist company obtains significant economies of scale by aggregating the demand for a raw material or activity from many companies. Such a specialist company can often obtain significant economies of scale that any one company would not be able to achieve. However, if a specialist supplier begins to dominate the market for that input, firms purchasing inputs from that supplier may become overly dependent upon that supplier and any cost advantages previously realized may be negated by the increase in the bargaining power of that supplier over the firms purchasing its products.

Likewise, a company pursuing a differentiation strategy may be able to outsource an activity to a specialist company that can perform that activity with a higher degree of quality or reliability. For example, high reliability in performance of an activity may occur when a specialist company focuses solely on that activity and develops capabilities and competences that other firms can not match. Outsourcing an activity or input to such specialized suppliers may enable a firm to further differentiate its own products or services, allowing the firm to charge a premium price. However, if competing firms following a similar strategy also decide to outsource to that same specialized supplier, the uniqueness of the raw material or activity may be diminished and, as a

result, any differentiation advantages that the firm may have previously enjoyed may be lost.

MODELING OUTSOURCING ELEMENTS INTO A STRATEGY GAME

In this section we will present a conceptual approach to incorporating some outsourcing principles into strategy-oriented game. This will be done using a single product full enterprise game. The simulation uses the Gold Pray Demand Function [1984] with the following marketing related variables: price, promotion, and product R&D, service, and failure rates.

The approach consists of the following steps. First identify the different generic strategies that can be played in the game. Since it is desired to have different outsourcing strategies for different business strategies it will be necessary for the computer to identify and track the strategies of each team. The designer will need to establish a limited number of outsourcing option for each strategy. The options should be based on the desired learning outcomes – avoiding common mistakes and looking for best practices.

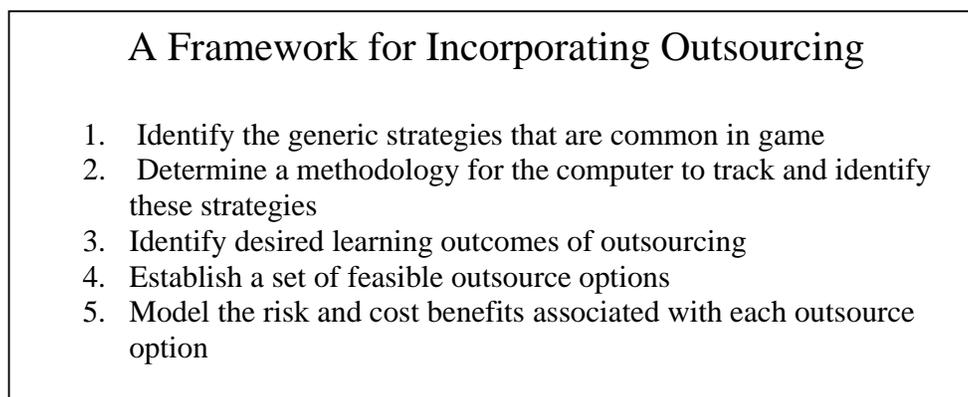
AN EXAMPLE

In the business game that we used there are four common generic strategies that students often attempt to play. These are (1) low cost and high volume, (2) differentiator with high price and promotion and low volume, (3) a differentiation strategy based on features and good quality and (4) a differentiation strategy based on high service and good quality.

IDENTIFYING AND TRACKING STRATEGIES

We decided to restrict outsourcing ventures to those who have implemented one of the generic business strategies. If they have not been consistent with implementing a strategy or if they have not met the desired strategic metrics they will not be allowed to participate in the outsource possibilities. Part of the rationale is that the

Figure 1
A Framework for Incorporating Outsourcing



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outsourcing literature Paul [2001] on effective outsourcing supports the need for a solid business plan, and this is a way to encourage teams to pick a strategy and stick with it!

To identify and track strategies we opted for using a statistical method base on z-score calculations. With this procedure the computer keeps easy tabs on the metrics and allows for sensitivity analysis by the designer or user.

Since the Gold-Pray [1984] demand function was employed many of the key strategy variables were already in exponentially smoothed z values. The exponentially smoothed values came from p_i, m_i, s_i, r_{di} and f_i below:

The market demand was expressed as:

$$Q = gP^{-(g2+g3P)} M^{+(g4-g5M)} RD^{-(g6+g7D)} S^{(g8-g9S)} F^{(g10-g11F)} \quad [1]$$

Where: Q = market demand.

P = harmonic average price over all firms

M = average marketing expenditure for all firms.

RD = average product R&D of all firms

S = average service of all firms

F = average failure rate of all firms

g = market demand parameters k.

To determine share the following model was used

$$w_i = k_o(p_i)^{-(k1+k2pi)} (m_i)^{+(k3+k4mi)} (rd_i)^{-(k5+k6rdi)} (s_i)^{-(k7+k8si)} (f_i)^{-(k9+k10fi)} \quad [2]$$

Where: w_i = weight for firm i.

p_i = exponentially smoothed price for firm i.

m_i = exponentially smoothed marketing \$ firm i.

rd_i = exponentially smoothed product R&D firm i.

s_i = exponentially smoothed service firm i.

f_i = exponentially smoothed failure rate firm i.

k_o = scaling factor

Figure 2 below summarizes the seven variables and the criteria chosen to help identify team's strategy. For example if a firm wanted to be a differentiator based on promotion they would need to have a zscore on their Promotion at least .7 above the mean and a zscore on Price at least .05 above the average. In a similar fashion a low cost producer must have a zscore on COGS and Full Cost below the mean by at least .05. In our approach we opted to have teams improve their quality to be considered for outsourcing. Specifically they must have a failure rate of less .01 to qualify.

We then setup a procedure to check each team after each round of the game to see if they were qualified to consider the different outsourcing strategies. If they failed to meet the required zscores they were not allowed to choose an outsourcing option. In Figure 3, firm 3 has qualified to do outsourcing for a differentiation strategy based of high level of service. Notice their zscore on strategy was greater than 1 and their quality was about .8%.

OUTSOURCING OPTIONS

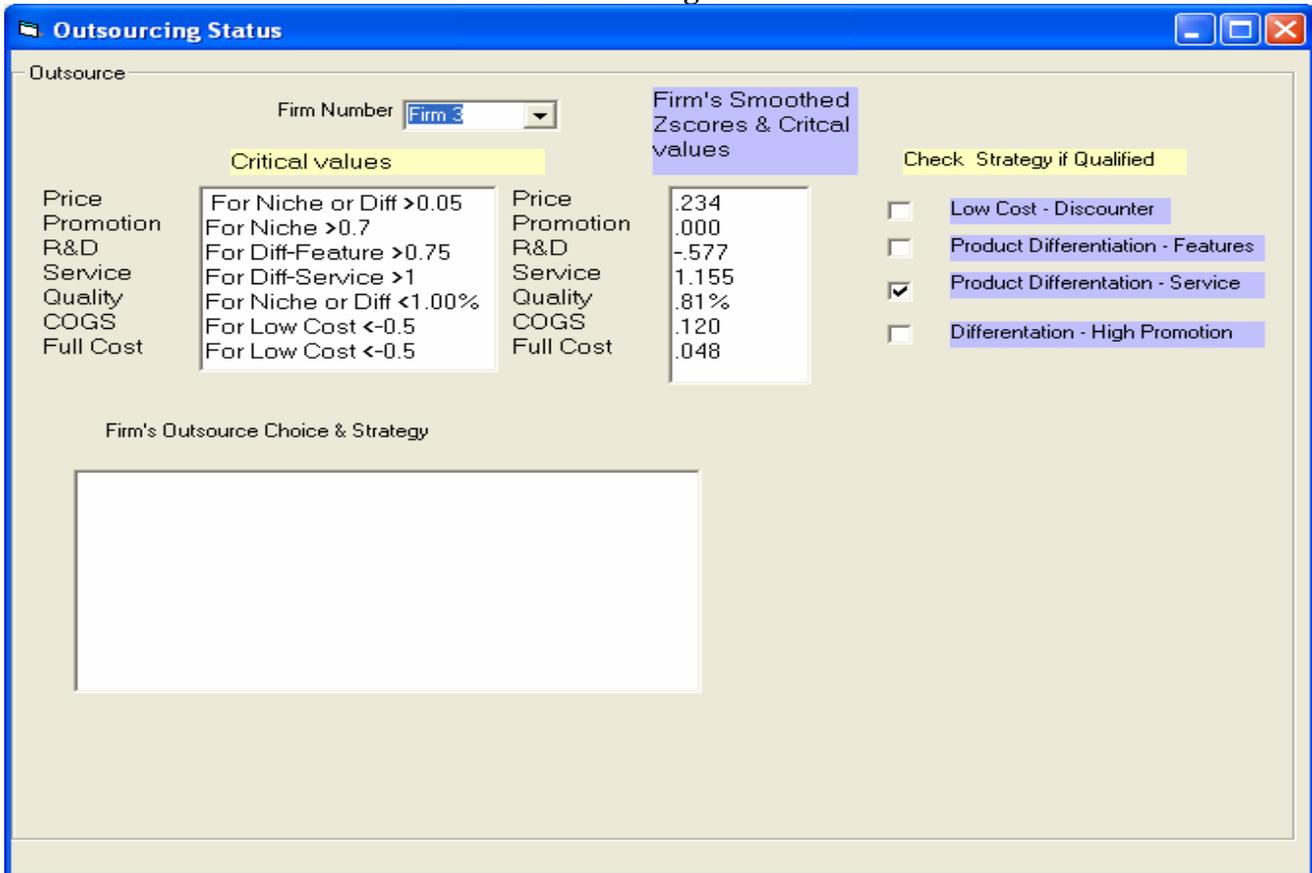
Four different outsourcing scenarios were developed for each strategy. To keep the process simple we only allowed the teams to outsource their raw material 1 (RM 1) which currently is done internally by a subsidiary of the company. Raw Material 1 cost \$1.50 per unit without outsourcing. Figure 4 summarizes each option, relates the market share

Figure 2
Zscores and Generic Strategies

Critical Value	
Zscore Price	0.05
ZscorePromo	0.70
ZscoreR&D	0.75
ZscoreService	1.00
Failure Rate	0.01000
ZscoreCOGS	-0.50
ZscoreFullCST	-0.50

Save to Data Dir
Transfer to Firm Disks
Exit

Figure 3
Outsourcing Status



of the supplier, explains the cost narrative and gives the new raw material 1(RM1) cost.

As can be seen on the “outsourcing setup” screen, four different scenarios are possible based on the business level strategy a team has decided to follow. These four strategies are:

- Low-cost producer.
- Differentiation based on product features.
- Differentiation based on customer service and product reparability.
- Differentiation based on enhance product image and design.

Low-cost Producer: A team following a low-cost strategy would be presented with four outsourcing options or possible suppliers to select from. Also shown on the outsourcing screen are the market share and the price that each supplier charges for its raw materials. Companies with higher market shares than other companies are likely to enjoy economies of scale and thus have lower costs than competitors. If multiple teams select the same company to supply them that raw material, that company is likely to gain market share and therefore the price charged for the raw materials produced by that supplier may go down. However, if all teams select the same supplier and that supplier begins to dominate the market, the bargaining

power of that supplier may increase and prices may not go down as rapidly as the supplier’s costs. Note also that a team has the option to outsource to Company D, a company that supplies a raw material with enhanced features. Any teams pursuing a low cost strategy that foolishly selects this option is likely to see their cost advantage eroded and decreased demand for their product.

Differentiation based on product features. A team following a differentiation strategy based on product features would also be presented with four outsourcing options or possible supplier to select from. Teams could select to outsource to Company E, but team’s selecting this option would pay a little more for a raw material that is characterized by average features. Teams could outsource to company F whose outputs are characterized as having above average features or they could outsource to Company G whose outputs are characterized as having best-in-class features. Obviously, the team would have to pay more for the outputs of Company G than they would for Company F. If multiple teams outsource to the same company, that company could realize some cost advantages due to economies of scale, but the uniqueness of the output would be diminished, which could negatively impact these team’s differentiation advantage. Any team pursuing a differentiation strategy that elects to outsource to Company

Figure 4
Outsourcing Setup

Category	Item	Market Share	Cost Narrative	Cost
Low Cost - Discounter	RM1 to Company A	0.10	Low Cost supplier	\$1.45
	RM1 to Company B	0.12	Low Cost supplier	\$1.45
	RM1 to Company C	0.10	Low Cost supplier	\$1.45
	RM1 to Company D	0.05	Enhanced features	\$1.65
Differentiation - Features	RM1 to Company E	0.15	RM1 - Enhanced Features_ Average	\$1.52
	RM1 to Company F	0.10	RM1 - Enhanced Features_ Above Aver	\$1.60
	RM1 to Company G	0.20	RM1 - Enhanced Features_Best in Class	\$1.65
	RM1 to Company A	0.10	Low Cost supplier	\$1.45
Differentiation - Service	RM1 to Company G	0.08	Enhanced Repairability_Average	\$1.55
	RM1 to Company H	0.10	Enhanced Repairability_ Above Avergae	\$1.57
	RM 1 to Company I	0.12	Enhanced Repairability-Best in Class	\$1.60
	RM1 to Company B	2.00	Low Cost supplier	\$1.45
Differentiation - High Promotion	RM1 to Company J	0.05	Enhanced Image	\$1.60
	RM1 to Company K	0.07	Enhanced Image & Design	\$1.65
	RM1 to Company L	0.12	Enhanced Image & Design-best in Class	\$1.70
	RM1 to Company C	0.10	Low Cost Supplier	\$1.45

Lock values

Next Screen Exit

A, a company that supplies a basic raw material without any substantial features, is likely to see their differentiation advantage erode and decreased demand for their product.

Differentiation based on customer service and product reparability. This scenario is similar to that described above for a firm that is following a differentiation strategy, but in this case the outsourcing options would be focused on companies producing a material or output with varying degrees of reliability. A supplier that produces an output with best-in-class reparability will demand a higher price for its products than will a supplier that produces an output or material with average or above average reparability. If multiple teams outsource to the same company, that company could realize some cost advantages due to economies of scale, but the uniqueness of the output would be diminished, which could negatively impact these team’s differentiation advantage and thus demand for their products.

Differentiation based on enhanced image and design. This scenario is similar to that described above for a firm that is following a differentiation strategy, but in this case the outsourcing options would be focused on companies producing a material or output that may enhance the image or design of the products made by that team. A supplier that produces an output with characteristics that are best-in-class in terms of image or design will demand a

higher price for its products than will a supplier that produces an output or material with characteristics that are just above average. If multiple teams outsource to the same company, that company could realize some cost advantages due to economies of scale, but the uniqueness of the output would be diminished, which could negatively impact these team’s differentiation advantage and thus demand for their products.

OUTSOURCING IN ACTION

A team would opt to do some outsourcing would click on the outsourcing screen and then see if they qualify. If they failed to qualify based on the zscores they would receive the following message.

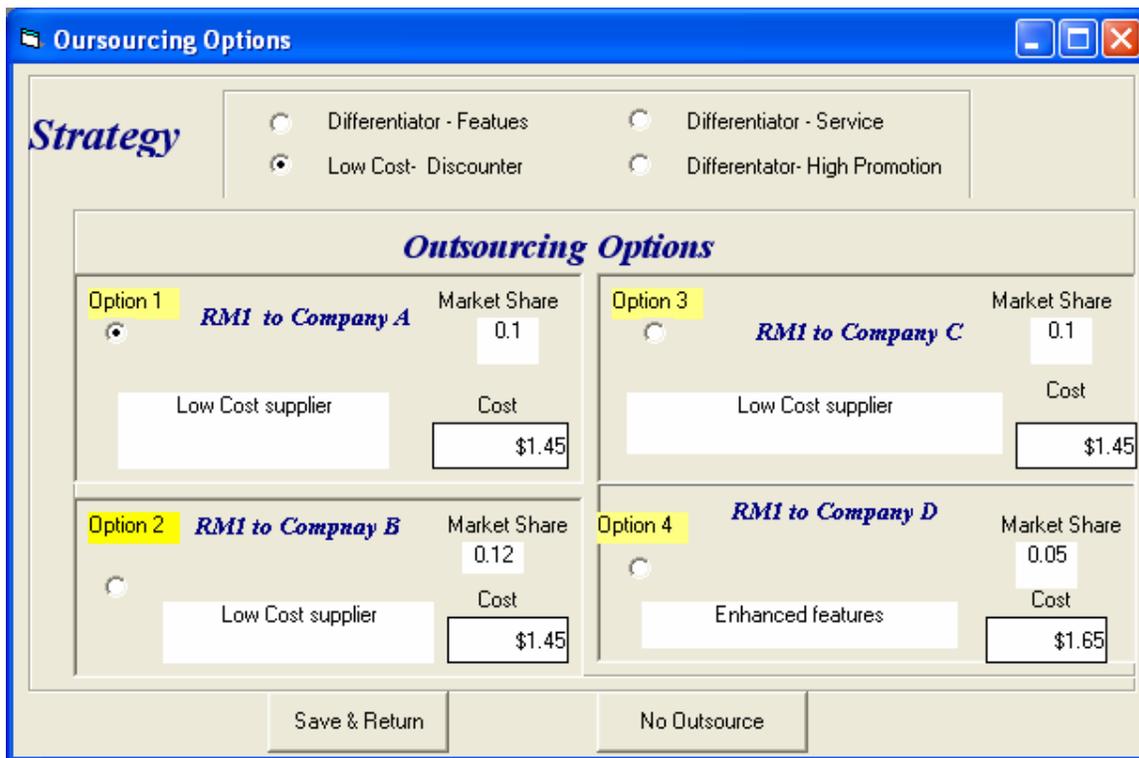
Figure 5
Not Qualifying Response

DECIDE

Strategy is not consistent with this classification

OK

Figure 6
Options for a Qualifying Team



If they qualified then they would see a screen like Figure 6 where a low cost producer would have the following options: (See Figure 6 above)

LEARNING OUTCOMES AND SUMMARY

The successful implementation of an outsourcing agreement depends on a number of important factors. The most important of these factors, perhaps, is the reason that the company is pursuing outsourcing at all. A survey by InformationWeek, McDougall, P. [2004] indicates that whereas in 2002 a majority of companies cited cost savings as their key reason to pursue outsourcing, the 2004 respondents pointed to operational excellence as more important. Paul (2001) identifies one downside of a fixation on price when selecting an outsourcing partner:

“It’s tempting to choose an outsourcer with an alluringly low price. But remember: Many of the new outsourcers have unproven track records and aren’t as stable as the companies that have been around for years rather than months.”

Given the results, it might be tempting to select an outsourcing provider not by their low price, but by their reputation and size. However, this is not always an effective solution either. The InformationWeek [2004] survey demonstrates: “something of an inverse relationship between a service provider’s market share and customer satisfaction.” In other words, as suppliers or service

providers become larger and more powerful, their motivation and ability to deliver on each account may be diminished.

As companies gain more and more experience, their learning builds the knowledge base of best practices for others to follow. A transition away from a cost or brand focus seems to reflect a broad refinement of the business perception of outsourcing’s purpose and benefits. Today’s successful outsourcing arrangements have the key criterion that they are well aligned with the company strategy.

The simulation model described above allows simulated companies to tailor their outsourcing arrangements (if any) with their selected strategy. While experimenting with the outsourcing experience, participants can achieve several learning outcomes:

Without a clearly defined and articulated strategy, outsourcing is not wise, and may not even be possible. In the provided model, teams must qualify in order to be eligible to make outsourcing decisions. That means that the outcomes of their early decisions must be consistent with some strategic direction. Teams that are unable to perform in accordance with a strategy are not eligible to outsource their raw materials, but could still be competitive in the game. Simplifying the decision making for teams that are not doing particularly well might be a way to help them recover while other teams struggle with the outsourcing arrangement.

Outsourcing based on cost may be appropriate, but is not right for everyone. In Figure 5 “Outsourcing Setup” screen, any team has the choice to try to lower their costs by selecting a less expensive provider. However, this choice will only offer an economic benefit when it is well aligned with the strategy of the organization. The Discounting strategy teams may well enjoy some strategic advantage from selecting a low cost outsourcing partner, but the other strategies likely will not.

Understanding the market power of a supplier is important. The impact of many teams choosing a single supplier is a subtle but important learning for the simulation participants. For one, a larger supplier may enjoy more market power over the simulated firms, and extract additional price for its materials. Furthermore, teams trying to differentiate themselves may undermine their strategic goals if other firms are selecting the same “differentiated” supplier.

SUMMARY

The present paper explores the modeling of outsourcing decisions in an Enterprise Business Simulation. A review of the business simulation literature revealed a lack of prior research on this important topic. The broader business literature (including academic journals and other publications) includes much information about the importance of outsourcing and some of the best practices that have developed. Since outsourcing is such a key element in modern business it needs to be integrated into strategy-oriented games

The alignment of outsourcing to the firm’s strategy is one key issue and drove most of the modeling decisions. The example simulation included several elements to allow participants to learn about outsourcing. First, firms had to “qualify” in order to participate in outsourcing, meaning that they must behave in accordance with some identifiable strategy. The simulation itself used statistical criteria to judge a firm’s qualification to participate. Once qualified, firms have a set of choices that are particular to their strategy. For example, a firm that is differentiating on features would be shown a set of alternative outsourcing partners that could impact their perceived level of features. Successful selections made by firms need to reflect an understanding of their own strategy and the potential role of outsourcing as a component of their strategy.

Current business games designers have not seriously modeled outsourcing decisions into them. This paper’s purpose is (i) to provide a framework for modeling of outsourcing and (ii) to start a discussion about outsourcing issues both from a users and a designer’s reference point.

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