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Service Spotlights

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Software Evolution in Web-Service Ecosystems: A Game-Theoretic Model (p. 1)

Evolution of service-oriented systems is an especially complicated process because of the involvement and independence of multiple stakeholders. In addition to technical considerations, there are also economic considerations that may threaten the stability of the business ecosystem. How do service providers make decisions about the adaptation and evolution of their services to achieve their technical goals and optimize their financial positions, while retaining stability in their business environments? In this work, the authors propose an economic model to describe the financial position of all stakeholders in a service ecosystem, and a business model based on game theory to capture the interactions and conflicting relationships in an ecosystem. These models can guide service providers in developing evolution strategies that consider competitor strategies, pricing policies, and client capabilities. The authors found that although solving this service evolution game may not always lead to the best option for each stakeholder, it will lead to a more stable ecosystem and more guaranteed benefits. In addition, the authors found opportunities for collaboration among stakeholders to maximize collective welfare without reducing benefits. A systematic decision-making process, which considers both competition and client expectations, can lead to stable and long-term profit-maximizing decisions.

Loyalty and Profitability of VIP and Non-VIP Customers in the Banking Service Industry (p. 19)

In the presence of heightened competition in the banking service industry, an effective approach to improve profitability is to target high-value VIP consumers per Pareto's 80/20 rule. This study investigates what important factors of VIP customers affect the firm's profitability and the effect of customer satisfaction and loyalty on firm profitability. Results indicate that customer loyalty is the main direct driver of the bank's profitability, and customer loyalty is positively influenced by customer satisfaction and trust, where the customer's perception of banking service positively affects their satisfaction and a customer's privacy concerns impacts his or her trust towards the company.

Interestingly, customer expectation and disconfirmation have no significant direct influence on customer satisfaction. It is of interest to note that this result mirrors research findings from the gambling industry where significant differences are found between VIP and non-VIP casino players in terms of perceived service quality with service quality having minimal influence on the behavioral loyalty of the non-VIP group. The managerial implication of this result suggests that the bank needs to focus on managing the expectations of VIP customers but not of non-VIP customers.

A Systemic and Relational Approach to Pricing Services (p. 37)

This paper develops an approach for generating optimal models for service pricing that can be tailored to the business objectives of the customer and the prevailing service environment. It takes examples of IT production service support and cloud services to elucidate the approach, which can be extended to services pricing in general. In this approach, *pricing units* are identified and connected into a causal model, helping to create a structure on which pricing decisions can be made. This model explicitly displays how *pricing units* are interrelated and how changes in one impacts related pricing units and facilitates propagation of values. For instance, in the IT production support domain "effectiveness of a known error database (KeDB)" could be a pricing unit and the service provider could be paid on the basis of percentage increase in effectiveness of KeDB. The causal model will make clear how increases in KeDB effectiveness could reduce incident resolution time, which not only decreases the cost of providing service support, but also enhances service availability, thus meeting two of the primary objectives IT production support service.

Categorizing Users of Cloud Services (p. 59)

Cloud platforms have increased productivity and scalability of many traditional services. To accelerate this progression, a detailed understanding of user interactions with cloud-based services is essential. The authors conducted a case study on nanoHUB services, the world's largest cyber infrastructure for nanotechnology research and education. Common wisdom suggests categorizing users with unsupervised methods

on survey and volunteered (demographic) data. The authors find that, surprisingly, this wisdom is incorrect because it does not scale, and is insufficient for behavior analysis because survey data mainly reflects intentions. Because actions speak louder than words, the authors propose a deductive categorization method and apply it to retrospective use data. The extracted data-driven categories, labelled power users and casual users, are separated by their distinctly different behavior. Moreover, subcategories of previously unknown classroom users are identified. The method is computationally lean and free of assumptions on data structure, and hence well suited for cloud-based services. Given nanoHUB's size and its leading role in educational services, the method seems applicable to a wide range of cloud services. The insight for the management: pre-defined categories cannot disperse user behavior, whereas data-driven metrics allow for identifying groups and tailoring services to them.

Asymmetric Bertrand-Edgeworth-Chamberlin Competition with Linear Demand: A Pediatric Vaccine Pricing Model (p. 71)

Pricing strategies in the U.S. pediatric vaccines market are studied using a Bertrand-Edgeworth-Chamberlin price game, which analyzes competition between capacity-constrained manufacturers producing differentiated products in a market with linear demand. In the U.S. pediatric vaccine market, a small number of vaccine manufacturers produce vaccines, where competing vaccines are differentiated based upon the number of reported medical adverse events, the number of different antigens, and special advantages of those vaccines. The results indicate that the public sector

prices of vaccines are higher than the equilibrium prices, and that when shortages of certain pediatric vaccines occur, market demand and degree of product differentiation are two key factors in computing equilibrium prices.

Commentary—Lessons from Nature: Enhancing the Adaptable Potential of Service Ecosystems (p. 85)

Can we learn about adaptability by unlocking billions of years of evidence about evolution? Using an interdisciplinary approach, the authors are able to translate species evolution and adaptability into a coherent structure for improving adaptability of service ecosystems. One lesson is to not plan long term. Imagine if the founder of Facebook in 2003 had proclaimed “I have a 10-year plan to turn my computer program that rates the attractiveness of my college dormmates into a worldwide service system of nearly a billion people that fundamentally changes the way humans communicate”; virtually everyone would have ignored him. Another lesson is to expect emergence. If you looked at the four simple molecules that form the backbone of DNA, you would never guess they could be used to make fruit flies or eggplants or water buffalo. It is precisely because emergence is so unpredictable that you typically cannot look for immediate immense benefits. You have to take a long view, a wide view, and a deep view of whatever process you are engaged in to have a chance of capturing its emergent properties. The insight provided is that mimicking the behavior illustrated in the twelve lessons from biological evolution enhances the ability to develop adaptable organizations and enhance adaptability of service ecosystems.