ADDING SERVICES TO PRODUCTS – AN INNOVATION CHALLENGE
A "Thought-Piece" from
The Farrell Center for Corporate Innovation and Entrepreneurship
Smeal College of Business, Penn State University.

Dr. Min Ding, Assistant Professor of Marketing
Dr. Gerald Susman, Klein Professor of Management
Dr. Anthony Warren, Farrell Professor in Entrepreneurship

Introduction.

This document is primarily a summary of a longer research report by the authors[1] funded by the National Institute of Standards and Technology. Although this study focused on small and medium sized enterprises, the findings, for the most part, are applicable to all manufacturing companies wishing to add a service component to their product portfolio.

US manufacturers face unrelenting pressure from powerful global customers and competitors to lower prices and accept shrinking margins. They have responded to this pressure by adopting innovations in operational excellence such as lean manufacturing and six-sigma. As these efforts approach their limits, companies are seeking growth from new products and services. One way is to offer customers new services that allow more efficient and effective use of the products that they currently buy; however, offering new services is uncharted territory for most companies and the management and organizational challenges required to navigate these waters are substantial.

Why Add Services?

There are many reasons why the addition of services can provide significant growth opportunities, greater stability, and higher profit margins to companies[2]. For example:

- Improving predictability of sales and cash flow by reducing cyclical variations. In addition, many product categories are becoming "commoditized". Adding or substituting service revenue can mitigate against this.
- Differentiation from competitors and establishing closer relationships with customers.
- Innovation in services usually results in increased customer satisfaction and loyalty, which eventually impacts financial results from higher gross margins, lower cost of sales, and recommendations to other potential customers.

Definition of Services

There are several definitions of service found in the literature, among the most useful is[3]:

---

[1] Susman, G., A. Warren and M. Ding., (2006)"Product and Service Innovation in Small and Medium-Sized Enterprises", www.smeal.psu.edu/fcfe

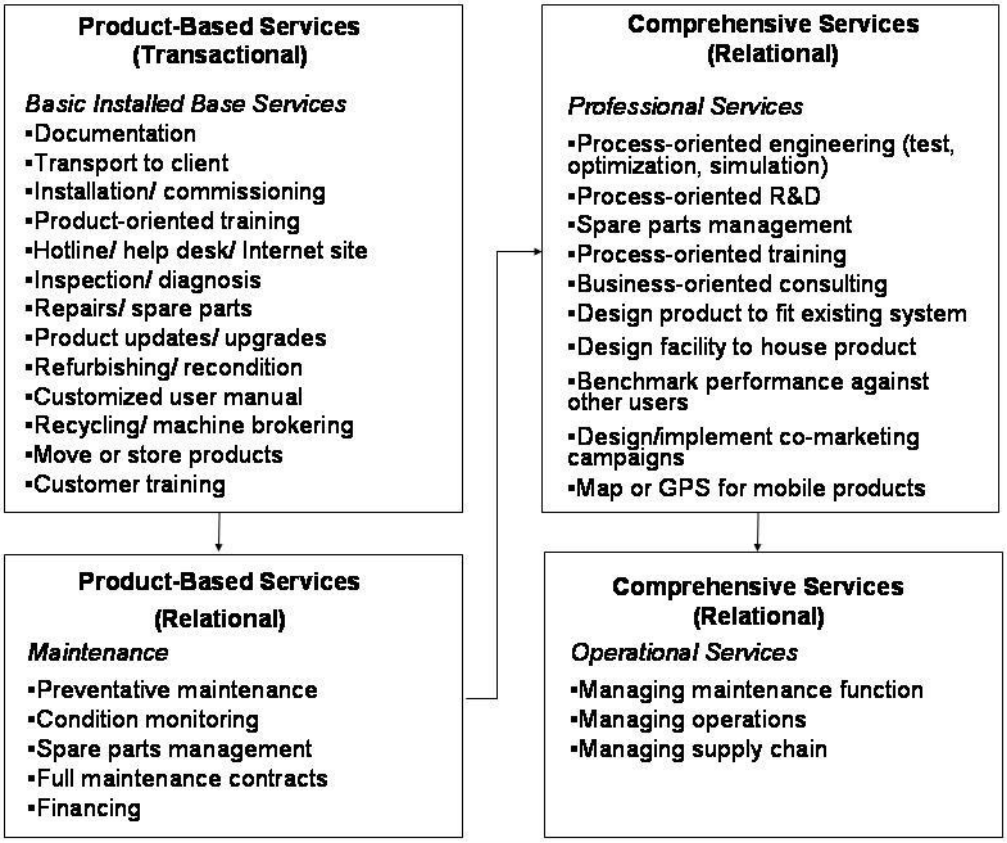
[2] Reinartz, W. and W. Ulaga (2006). "Growth beyond the core." Financial Times (31 March 2006): 10.

[3] Gustafsson, A. and M. D. Johnson (2003). "Competing in a Service Economy: How to Create a Competitive Advantage Through Service Development and Innovation". San Francisco: Jossey-Bass.

- An activity or series of activities of a more or less tangible nature that normally, but not necessarily, takes place in interaction between a customer and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems. Advances in information technology increasingly may remove the person-to-person interaction as a service is provided. Examples of this are the ubiquitous deployment of ATMs and more recently, check-in terminals at airports and hotels.

Types of Product-Related Services

A useful taxonomy[4] is to divide customer interfaces as either heavily transactional (or "product-like") to mainly relational ("pure service-like"). These authors, as well as others[5] suggest that firms must master product-based services first before graduating to comprehensive and relationship-based services. Firms that don't do this usually fail at transitioning to services.

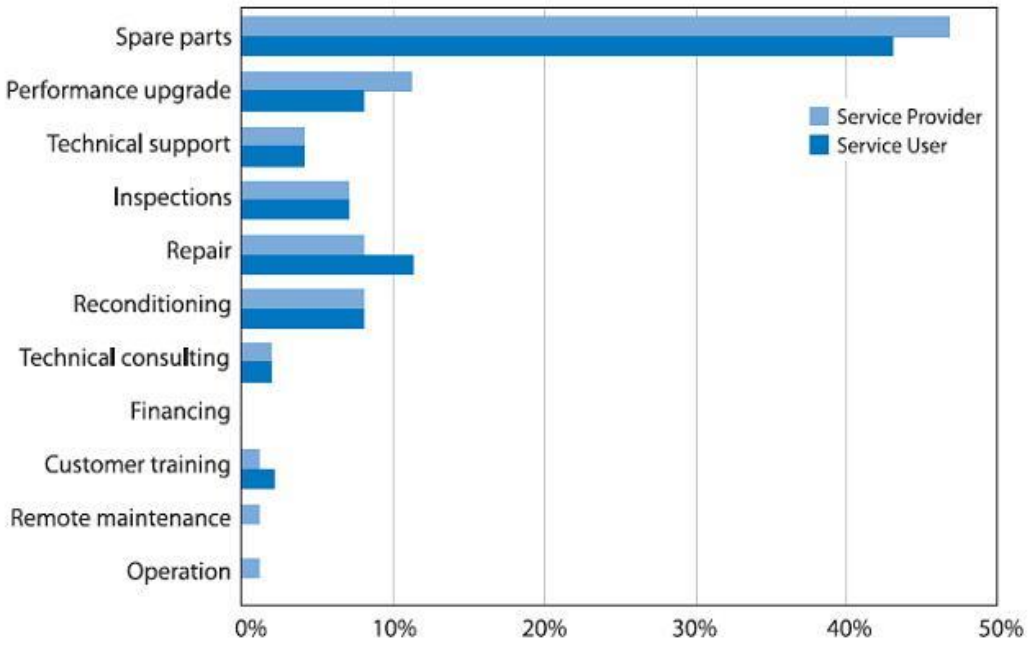


[4] Oliva, R. and R. Kallenberg (2003). "Managing the transition from products to services." International Journal of Service Industry Management **14**(2): 160-172.

[5] Davies,A, Brady,T and Hobday, M, (2006) "Charting a path toward integrated solutions", Sloan Management Review, **47,** no. 3, pp 39-48.

As firms seek to increase their service offerings and gain access deeper into their customer's value chain to offer more complete solutions, it is critical for them to understand both their individual customer needs as well as the overall market potential for their service offerings. This figure shows where the largest portions of customers' spending and providers' sales are taking place in the industrial service sector.

Share of Service Sales/Spending Volume by Type



Source: Monitor (2004) Industrial services strategies: The quest for faster growth and higher margins.

With all of these potential financial and strategic benefits available, we might expect that companies would be readily adding services to their product portfolios. However relatively few manufacturing companies have introduced services to their product offerings. There are some noticeable exceptions, such as IBM and GE of course. But even these large companies have struggled with making the transition. The reasons for this are complex particularly when a company attempts a hybrid model of products *plus* services, where the organizational, cultural, and management tasks are challenging and require significant change management.

Differences between Products and Services[6]

Services are inherently different from products in a number of key attributes:

[6] See e.g. de Jong. J. P., Vermeulen. P.A.M. (2003). "Organizing successful new service development", Management Decision **41,** (9): 844-858

- **Intangibility:** Services often, but not necessarily manifest themselves together with the customer. On the other hand, products are a) more often shipped to the customer, b) are developed with limited customer input, and even then, at the formative stage of development, c) the supplier may have limited knowledge of how the customer actually uses the product and d) most importantly, not fully understand the commercial benefit or value accrued during its use.
- **Ownership:** a pure service also does not transfer to the customer.
- **Heterogeneity:** services tend to be customized to the specific needs of the recipient. On the other hand, products are usually created in an identical series and can be sold from a catalog. Customization implies an inherently different relationship between supplier and customer.
- **Perishability:** Services are perishable and are usually created as they are used, whereas products can be made ahead of time and held in inventory.
- **Imitatability:** close customer relationships combined with uniqueness are difficult to imitate.
- **Synchronicity:** Often there is a simultaneous production and consumption of a service. Customers may participate in both the creation of the service innovation and production.

Innovation in Product-Based Services

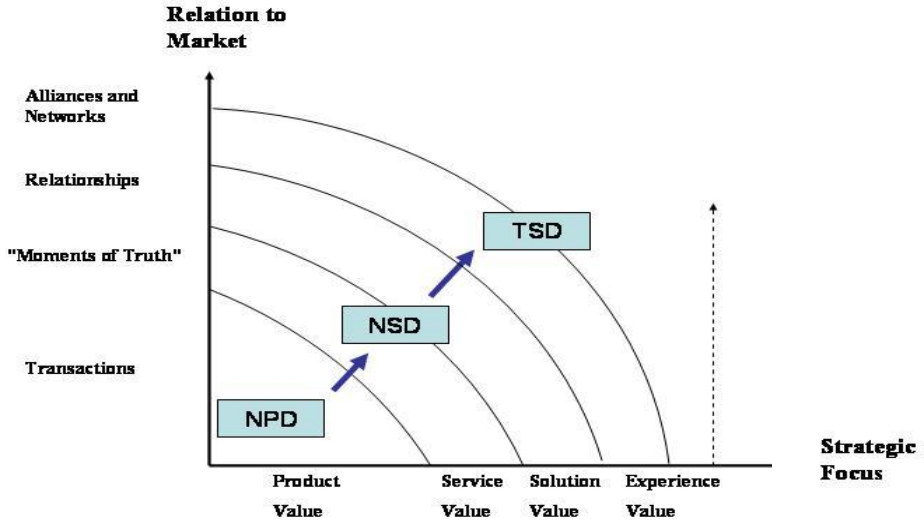
Innovation in purely service and manufacturing (products) industries differs because of the contrasting general characteristics of the two offerings. Due to the labor intensive nature of services, typically service innovations require much less capital investment. Service innovations usually require less R&D, require less in fixed assets, and need less investment on patents and licenses for the development of new services[7]. Technology is also less important for the development in new service as many times the face-to-face relationship building component becomes more important.

Because less of a financial and technological commitment is needed for service than manufacturing innovation, service innovation can be easier to imitate. As competing firms realize these features of service innovation, they may be tempted to copy the offering. However, it is not as easy as it may appear to imitate a competitor's service innovation. Though capital investment may be low, organizational aspects play a larger role in the success of service innovation. One common barrier to innovation in service firms is the lack of a robust human resource strategy. A fatal flaw for a service company can be the lack of well-educated co-workers capable and committed to the firm's mission, which can have a larger influence on the success of new services than on new manufactured products.

In order to examine the management and organizational challenges to move from purely product innovation to a "hybrid" or product + service business model, we define a new area of innovation or development, namely "Total Solution Development" (TSD) in which the corporation's

[7] Brouwer, E. and A. Kleinknecht (1997). "Measuring the unmeasurable: A country's non-R&D expenditure on product and service innovation." Research Policy **25**(8): 1235-1243.

attempts, as far as possible, to solve the total needs requirements of its customers. This construct was chosen, in order to relate to the existing management techniques in New Product and New Service Development (NPD and NSD respectively). The figure shows the transition from the (simple) world of NPD to TSD along two axes – the strategic objectives of the firm and the relationship with its customers.

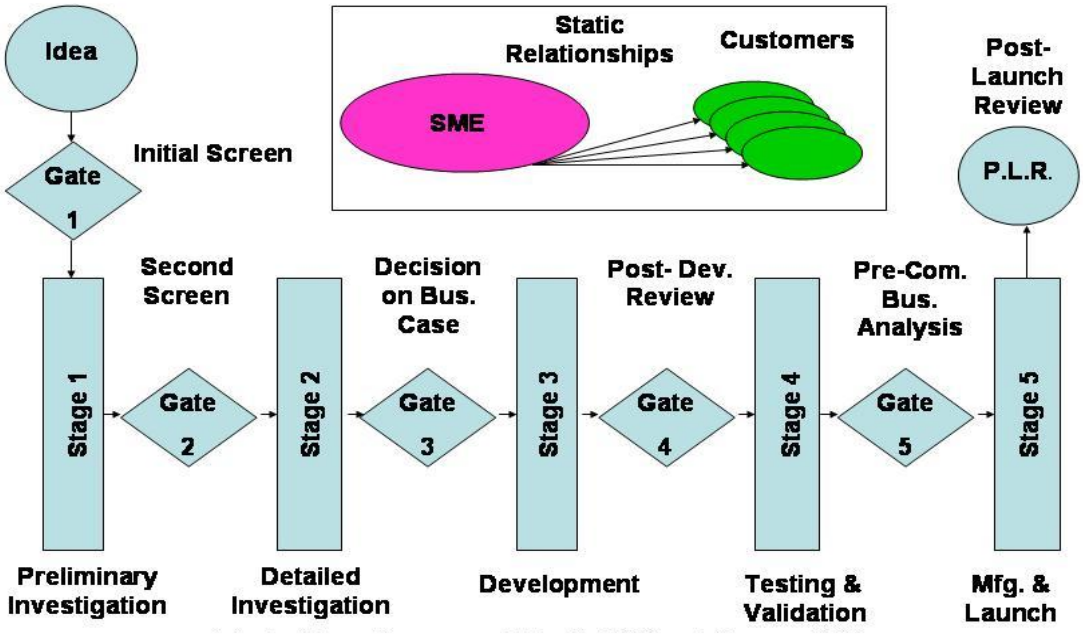


The upper right region of the figure is uncharted territory for most manufacturers. Comprehensive solutions for service delivery put the firm more in the role of system architect which provides more added-value than its components. This table compares the attributes of the three models.

	Closeness to Customer	Kinetics	Relationship	Information Flow	Organizational Issues
NPD	Low	Static	Remote One-Way	One-Way Out Low	Low
NSD	Medium	Flexible	One-on-One Close	One-Way In Medium	Medium
TSD	High	Dynamic	Networked Close	Bi-Directional High	High

Models for New Product Development and New Service Development

The "stage-gate" process for NPD[8] (figure below) shows five different gates. The process de-emphasizes continuous innovation and flexibility, which raises concern that rejected ideas are lost or not explored sufficiently as the focus is more on "getting the next product out of the door". It has worked well for larger organizations where resource management and controls are key issues. It is not clear whether it works well for service innovation, which requires greater flexibility and often "co-creation" of new ideas during close interaction with customers. New services may not have as clearly defined yardsticks for which a fixed gate could be associated. A

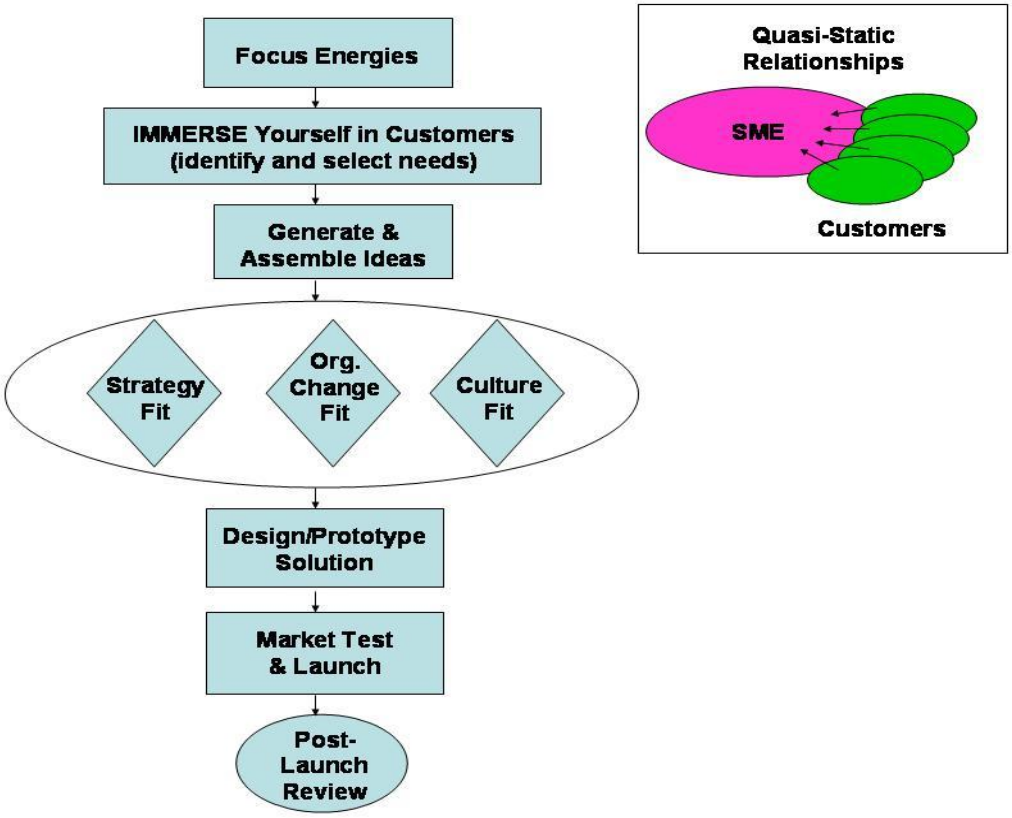


defining feature of an innovation paradigm is how it posits the relationship between the firm (internal) and external parties. The stage-gate process implies relatively static relationships between a firm and its customers (see insert). Some customer inputs are incorporated in this type of paradigm, but most activities in this innovation process are done *within* the firm.

In contrast to new product development, most new services are developed in an *ad hoc* fashion. Reference 6 discusses many reasons why this might be the case; for example, (1) new services can be imitated by competitors, and thus require a quick response and less formal process, (2) no natural milestones for review, unlike for new products. A new product concept, for example, must be shown that it can be engineered and, if it can, then must later be scaled up under certain cost constraints. A new service concept, on the other hand, normally does not have such relatively objective obstacles.

[8] Cooper R. G. (1984). "How New Product Strategies Impact on Performance." Jnl. of Prod. Innov, Mgmt **1**(1): 5-19

The figure below indicates that the stage-gate process can be adapted to new service development, by reducing the total number of stage-gates, but adding two new parallel gates for cultural and organizational change fit. A key gate is included between idea generation and design/prototype solution. Within this gate cultural and organizational change fit, in addition to strategy fit, are the key criteria that determine whether an idea will move to the next phase of NSD. These two additional dimensions are necessary as new service, unlike new products, require change in culture and organization. Unlike the stage-gate process, the model explicitly incorporates needs-identification referred to as "Immerse Yourself in Customers".



In addition, the model shows a closer relationship between the service provider and customers. It posits that service is driven by unmet customer needs, customers are "listened to" and information flows primarily from the customer.

Model for Total Solution Development.

We propose that these methods can be taken further by adopting a "Total Solution Development" or TSD model. The difference between TSD and the previously discussed new product and new service development models is that the TSD model generally starts with an established base of products and customers, but it does not limit its future innovation to either products or services; instead it posits that a firm *should let customer needs dictate the type of innovation the firm should develop*, either service, or product, or a product/service combination.

Such an approach requires the firm to engage more completely with external parties (e.g., supply chain members, potential partners, and competitors), and have a *dynamic* rather than *static* interaction with customers. Some companies go as far as having a full-time relationship person on-site to ensure this continual interaction with the customer. See the figure for more details.

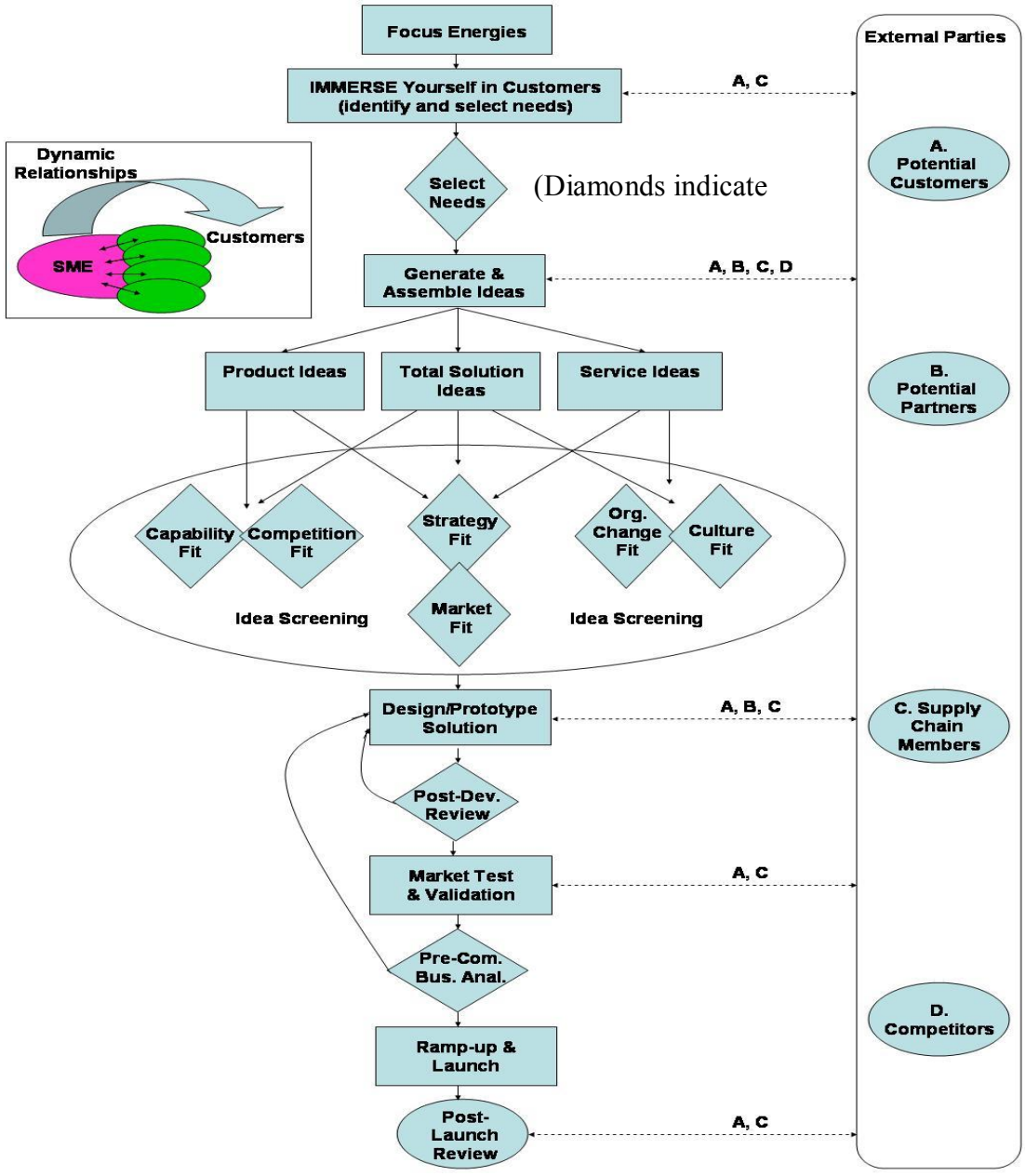
TSD goes even further – it incorporates the key roles of strategic, organizational change and culture fit. However, TSD makes explicit differentiation among new service, new product, and service/product combination, and recognizes the criteria used to select these three different types of ideas differ. Capability and competition are added as part of this gate, but mostly for new product or new product/service combination ideas.

Unlike either of the previous models, TSD explicitly differentiates among new service, new product, and a product/service combination. TSD espouses a strong and dynamic relationship between the firm and customers (see insert) suggesting an intimate collaboration with customers with continuous bi-directional exchange of information. External parties, other than customers, are explicitly incorporated into the entire process of innovation.

TSD dictates innovation should be an iterative and adaptive process; two specific arrows exemplify this process. One arrow goes from the post development review gate back to the design/prototype solutions stage, and the other arrow goes from the pre-commercial business analysis gate back to the design/prototype solution. A stage is not meant to be visited only once during the TSD process. Even idea generation may be revisited if previous new ideas do not appear to be attractive during the following gates. It should also be highly adaptive, conditional on the type of innovation (product, service, and product/service combination).

There are several additional unique features of the TSD. One is parallel processing. The cycle time must be short to react quickly to changing market conditions and prevent easy copying by competitors. To reduce cycle time, it is essential to engage in some TSD stages in parallel.

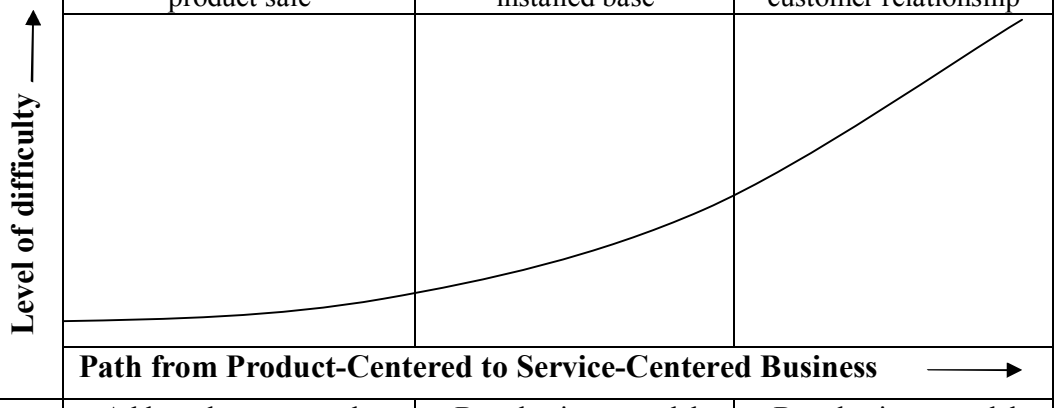
Cross functional teams are a critical component in TSD. They increase the probability of success in new solution development and may avoid costly mistakes. The composition of such teams should reflect the type of innovation (product, service, or combination), and represent all functional departments that will be involved in actually developing, producing, and delivering the innovation. An innovation, if adopted by a firm, will have a different impact on individuals within the firm – some people's careers will be enhanced and compensation increased, while others will have the opposite fate. As a result, it is important for a firm to put the right incentives in place for the people involved, and make sure that it is in the best interest of everybody (at least those involved in the development) to come up with new solutions that serve the firm best. Another aspect of incentives is to encourage risk taking. An individual (or team) should not be punished if the innovation fails, if all due diligence was exercised. A culture of risk-taking is essential for a successful innovation process. Unlike products, many services are delivered by individual employees and the quality of service can vary greatly depending on the training and experience of employees. It is critical that personnel training is conducted properly regardless of whether the solution is a product, service or product/service combination.



Transition Management

Manufacturing companies find it difficult to enter service-centered businesses, and thus fail to exploit the financial potential that such businesses offer. Nearly all product manufacturing companies that invest heavily in extending their service businesses increase their service

offerings and incur higher costs, but do not always get expected corresponding higher returns. This is referred to as the "service paradox"[9]. Effective transition into a service-centered business requires a transition strategy as well as management of employee motivation and supporting organizational structure and culture. The table shows one transition plan that is broken down into three well-defined phases. Each phase has its own organizational change challenges that must be overcome as the move from a transactional to a relational business model is effected.



Transition Issues	• Add product-centered services • Consolidate services into a single unit • Staff and train service sales force • Develop incentives, measures, rewards for selling services • Build a serviced-centered culture	• Base business model on quick response and customization • Shift downtime risk from customer to service supplier • Transition from transactional to relational selling	• Base business model on low cost and convenience over product life • Extend customer relationship deep into value chain • Develop TSD skills

Summary and Challenges

Adding services around new products offers major strategic benefits to manufacturers. However, the inherent differences between product and service innovation and delivery pose major management and organizational challenges which fundamentally impact the core culture and values of an enterprise. The transition should be executed in well-defined phases with financial incentives and budgetary reporting clearly underpinning the changes.

We offer specific recommendations for each of the phases in the longer paper (reference 1)

[9] Gebauer, H., E. Fleisch, T. Friedli (2005). "Overcoming the service paradox in manufacturing companies." European Management Journal **23**(1): 14-26.