What is the relationship between performance improvements and the three classical manufacturing strategy paradigms of fit, best practices, and capabilities?

Improving performance in areas such as quality, flexibility, and delivery can be achieved through building capabilities and/or adopting best practices, but not apparently by maintaining internal fit between operations structure and processes.

There is a long-standing debate in manufacturing strategy over the approaches for product and process choice. Since the late 1970s, researchers have discussed the merits of designing and improving operations based on alternative perspectives such as developing capabilities, adopting best practices (BPs), and maintaining fit.

Despite the continuous research on these paradigms, the debate goes on. In particular, it is not clear what paradigm or combination of paradigms can best explain performance improvements. For a start, most empirical studies investigated effects of individual paradigms as independent from others.

Our recent study explored manufacturing performance relationships with the three paradigms. Specifically, we tested whether scales of internal fit, capabilities, and BPs relate to performance improvements in manufacturing.

Collectively, the results suggested that building capabilities and adopting BPs both have positive relationships with operations performance, whereas internal fit may have even negative relationships with performance. Therefore, developing manufacturing capabilities and adopting BPs seem to be at the core of producing manufacturing performance.

Concerning capabilities, the results stress the importance of external learning, which related to all performance dimensions. Concerning BPs, the results support the notion that different practices may relate to different performance dimensions. In particular, new product development (NPD) explained mostly delivery performance, while total quality management (TQM) related to all dimensions.

Results on internal fit

The absence of significant quality and delivery relationships with internal fit is surprising, given the strong emphasis given to fit in the literature. Several explanations may account for this. First, although past studies found evidence of the impact of external fit or aggregated fit (internal and external) on performance, few addressed the impact of internal fit alone. One possible explanation might be that internal fit per se cannot explain quality or delivery performance, or that it would only in companies functioning within harsh competitive environments. Having a production system with high internal consistency (e.g. where the manufacturing function has a high focus on process automation and the adoption of a high volume process and infrastructure) may not contribute to performance if the system is not aligned with markets and the external environment (e.g. the high-volume process could be called upon to respond to demands from low-volume markets).
This explanation is consistent with studies in the strategy field, which emphasise external fit, and would suggest that the same emphasis be applied in manufacturing strategy frameworks. This would also imply considering fit at the broader business unit/firm level, rather than at the narrower plant level.

A second explanation is that there could be a non-linear effect of internal fit on those performance dimensions. It could be that very low levels of internal fit influence performance, but once a minimum threshold is achieved, no further gains are obtained. Hence, internal fit could be seen as a hygiene factor rather than as a key driver of performance. As a third explanation, our results could be seen to support views that fit (either internal or external) does not support improved performance.

In the strategy field, a few studies have raised doubts as to the impact of fit on performance. In manufacturing strategy, authors have been critical of relying on "strategic fit" in times of competitive turbulence, while supporters of the BPs paradigm argued that a plant exhibiting high coherence between manufacturing choices but employing obsolete practices would most likely not be a good performer.

The negative relationship between internal fit and flexibility suggested by the results when analysed are of particular interest. Again, this would appear to contradict previous operations strategy studies; however, it does align with the view that poor practices cannot be justified under the pretext of maintaining fit. For example, manufacturers having high levels of fit as measured by our index would have either high work-in-process or high finished goods inventories in their plants (trade-off view). These practices might appear consistent with other choices in process structure and infrastructure, but either type of inventories still amounts to waste. With flexibility in particular, the organization's cost or effort to maintain internal fit might even limit the options regarding the mix and volume of outputs, especially in changing markets. In such circumstances, internal fit ceases to be an asset and becomes a competitive liability.

**Interaction effects and co-variants**

We found some evidence for moderating effects between paradigms. Previous research raised the possibility of such interaction effects existing, including synergies between capabilities and BPs. For example, the development of organizational capabilities would allow a firm to know why, how, and when to execute a certain practice, while using BPs might contribute to further learning and developing capabilities. Similarly, there could be interactions between fit and both BPs and capabilities. For example, it has been suggested that operations competitiveness relies on both capability development and positioning, while, for others, "strategic integration" could moderate relationships between BPs and performance.

Regarding associations between performance and co-variants, the lack of significant relationships with company size was somewhat surprising given the abundant research specifying specific correlations between size and operations performance metrics. Previous studies suggested performance in areas such as quality and flexibility might either increase or decrease with company size, so perhaps building performance variables that included multiple performance items under each scale might have "balanced out" positive and negative correlations with size under the same construct, yielding non-significant relationships. Relationships involving country and market dynamics appeared consistent with expectations and the literature. Countries with lower GDP (gross domestic product) per capita had greater quality and delivery improvements, which is consistent with views about countries such as China and India. Finally, companies operating in markets with faster growth registered greater performance improvements, which might be due to shielding against competition in increasingly more attractive markets.

**Managerial implications**

For practitioners, the study suggests that firms should build performance advantage by learning new capabilities and adopting BPs. Concerning capabilities, the impact of external learning on all performance dimensions stresses the need for plants to
collaborate and share information with customers and suppliers in such areas as product design and production planning/forecasting. Thus, plants should recognize their network of relationships as not only immediate sources of business, but also as effective sources of learning. Internal learning achieved through a collaborative and empowered workforce should also have a positive impact particularly on quality and delivery. Concerning BPs, the broad performance impact of (TQM) reinforces the generally established role of this practice as a driver of overall manufacturing performance.

We found no evidence of a positive impact of internal fit on performance. This has important implications for practice because today’s pace of technology change and shorter life cycles leads to a larger number of manufacturing units in transitional states where poor internal fit may occur. In these fast changing environments, situations of misfit may take time to correct because the associated variables may have high inertia, i.e. be difficult to change in the short-term. Our results suggested that substantial efforts to maintain high levels of internal consistency among manufacturing strategy choices may not always payoff, and might even have detrimental consequences to manufacturing flexibility.

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