

Combining the capabilities of lean and agile manufacturing

The positive impact on organizational performance

Lean manufacturing and agile manufacturing

Ongoing improvement is essential if today's business organizations are to meet customer needs as they constantly evolve. Those that fail in this respect will struggle to gain any competitive edge let alone sustain one.

As challenges grow tougher, wise operators have reacted by developing strategies that aim to enhance systems and capabilities. Having appropriate programs in place better positions them to boost overall performance.

Considerable focus has therefore been placed on lean manufacturing (LM) and agile manufacturing (AM). These initiatives are widely acknowledged as helping firms to lift production quality and efficiency to new heights.

Both types of mechanisms are widely lauded in the business literature. Lowering and eventual eradication of waste and activities that fail to add operational value is seen as the aim of LM. Goals can be achieved through deployment of core lean aspects Just in Time (JIT) production and Total Quality Management (TQM). Researchers term the components 'bundles' and point out the critical role human resource management (HRM) plays as an enabling force.

Where agile manufacturing is concerned, the emphasis is on the company's ability to react quickly and efficiently in the face of change. Such capacity is even more vital when unanticipated developments occur. Swifter system changeover times, tailored product offerings and adjustment to levels of operation in line with demand are among measures associated with AM.

Conflicting or complementary systems?

Much debate persists across the research community as to whether these mechanisms clash or complement each other. That LM and AM encompass unique practices alongside others that are typical within both of the manufacturing programs serves to exacerbate the overall lack of consensus.

Those situated in the conflict camp argue that the two programs differ markedly in such as their effect on specific organizational strategies and performance objectives. Market conditions likewise often determine their respective impact. More specifically, it is argued that lean manufacturing is most relevant within a stable operating environment. Inherent process consistency is highly important in such conditions. But this becomes much less effective when markets are more unpredictable. That scenario instead calls for the greater flexibility and swifter responsiveness that AM offers.

Such disparities add fuel to claims that LM and AM are diverse animals which will struggle to coexist productively. However, plenty evidence suggests that similarities outweigh these differences. The argument that manufacturing programs function in a complementary manner might therefore be a more compelling one.

Recent work noted that LM and AM share various common internal and external infrastructures. This is undoubtedly significant. Strategic vision and planning, information systems and autonomy within teams are chief among internal examples. And where external infrastructures are concerned, key practices include relationships with customers and suppliers and other stakeholders.

In essence, lean manufacturing and agile manufacturing appear to be intrinsically linked. This is evidenced in studies revealing how TQM and JIT serve as “precursors” to AM. Indeed, some scholars believe that high levels of agility can be attained when these programs are used in tandem with advanced technologies. Others note the “holistic” nature of LM and the different facets of production that are incorporated within this paradigm. That characteristics more typically associated with AM such as adaptability are included too is especially significant. Likewise, agile operators are not averse to the deployment of lean manufacturing practices.

Implementing the manufacturing programs for maximum effect

Potential clearly exists to boost performance through implementation of lean and agile manufacturing. An exploration of firms in Pakistan's apparel production sector implies as much. Textile and clothing businesses are critical to the manufacturing industry, exports and the nation's GDP. However, lack of investment in new technologies has led to operators falling behind counterparts in China and Singapore.

Research conducted in Pakistan reveals that lean and agile manufacturing is capable of boosting operational, market and financial performance. Even more significant is the fact that the aggregate effect is greater than on each individual performance dimension.

Equally striking is evidence that the combined impact of LM and AM can be far stronger than when they are wielded separately. Such indications obviously add weight to claims that the respective systems complement rather than conflict.

Synergy is clearly king here and organizations should quickly become cognizant of that fact. Simply being aware is not nearly enough though. In order to fully exploit the capabilities of these manufacturing programs, firms need to:

- simultaneously invest in the complementary resources;
- implement LM and LM together to attain optimal results. On the contrary, a “piecemeal” approach will dilute the impact significantly;
- ensure that the firm's leadership are fully on board, properly informed and adequately prepared in the use of quality tools, techniques and processes;
- invest in employees and put other key internal resources in place such as training, reward systems and a supportive culture;

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- suitably align external resources, especially the valuable capabilities offered by customers and suppliers;
- upgrade technologies in order to enhance the sophistication of supporting infrastructures; and
- improve the skills and competences of HR and permit sufficient levels of empowerment.

The whole is often greater than the sum of its parts and that is patently the case here too. Firms that take this on board and adopt the right approach can substantially boost overall capabilities. Greater operational efficiency and less waste are just two of the performance improvements that will then be well within reach.

For garment manufacturers in Pakistan, any commitment to making the necessary investments will depend on the outcome of thorough cost-benefit analyses that must be carried out. But those that do ultimately take the plunge should rightly feel more confident about handling the unique demands of their operating environment. This might then reinvigorate the sector and help increase competitiveness within international markets.

Comment

The review is based on: “Lean and agile manufacturing: complementary or competing capabilities?,” by [Iqbal et al. \(2020\)](#), published in *Journal of Manufacturing Technology Management*. Companies can significantly boost performance by utilizing the capabilities respectively offered by lean and agile manufacturing. An approach that considers the programs as complementary and focuses on developing appropriate supporting mechanisms offers most scope to maximize performance improvements.

Keywords:

Lean manufacturing,
Agile manufacturing,
Total quality management,
Just-in-time

Reference

Iqbal, T., Jajja, M.S.S., Bhutta, M.K. and Qureshi, S.N. (2020), “Lean and agile manufacturing: complementary or competing capabilities?”, *Journal of Manufacturing Technology Management*, ISSN 1741-038X, doi: [10.1108/JMTM-04-2019-0165](https://doi.org/10.1108/JMTM-04-2019-0165).

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