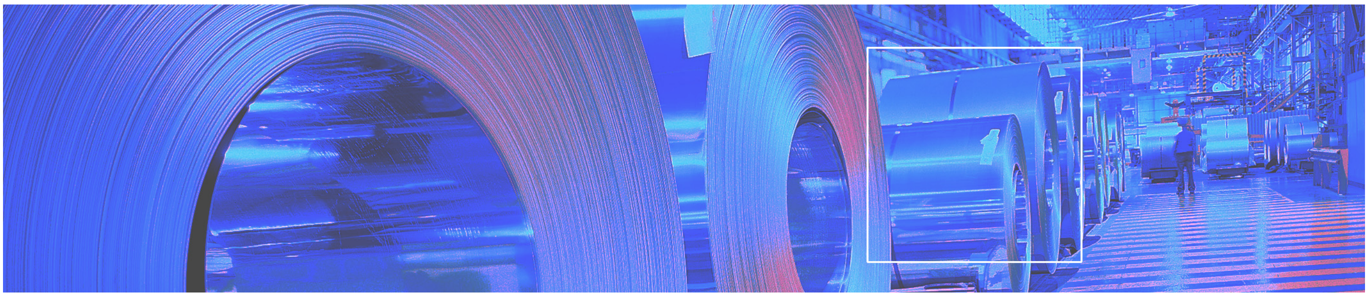
Regaining control

How to break free from the complexity trap



Complexity poses one of the biggest challenges that operations managers face today. Rapid advances in technology make it possible for businesses to increase product variants and service offerings to meet customer demands. In addition, value chains are far more complex than ever before. In fact, the diversification of products and markets has reached such a level that aligning the overall portfolio with the operations system is now a major concern for operations managers worldwide. To manage this ever-increasing complexity, Arthur D. Little has developed an Operations Management Framework to support structured decision-making on complexity issues. By bringing their business's inherent complexity in line with their capacity to manage complexity, companies can escape the complexity trap and secure long-term profitability.

The complexity challenge

Today's customers demand individuality – and businesses respond by offering a variety of products and services and by innovating constantly. However, this response increases the complexity of operations and makes managing them difficult. Increased complexity hinders the effective use of various levers throughout the supply chain. For example, it prevents Procurement from taking advantage of parts-bundling, Warehousing has to deal with high inventories due to the number of listed material styles and safety stocks, production planning gets ever more complicated and errors occur. The resulting downtimes, production losses, additional planning capacity required and increased costs stemming from the need for more working capital ultimately lead to diminished margins.

Arthur D. Little has been exploring the causes and drivers of complexity for several years. As a result, we have developed a comprehensive approach to complexity management that can be applied throughout the product lifecycle. We have already used our approach to help many clients achieve significant efficiency gains.

Five levers for value-oriented complexity management

Complexity management always involves five categories of measures (see figure 1):

- **Transparency**

  Understanding the real cost of complexity with regard to products, services, processes as well as the value for the customer is the initial starting point of complexity management.

- **Focus**

  If transparency is established, the company is able to realign the value chain, products and service portfolio based on the complexity analysis.

- **Structure**

  Well applied structures (e.g. modularisation, segmentation and standardisation) of products, services, processes and the organisation enable leveraging customer oriented complexity and at the same time reduce internal complexity to the maximum.

- **Coordination**

  The defined structure has to be supported by the right coordination mechanisms. This includes setting information flows and incentive systems right and focusing on complexity optimised value creation.

- **Qualification**

  Finally, any operations system needs the right level of qualification to cope with the defined level of complexity to be managed. This includes training and development as well as system enhancement initiatives (e.g. TQM, Kaizen).

However, measures need to be configured according to a company's specific situation and the product lifecycle stage.

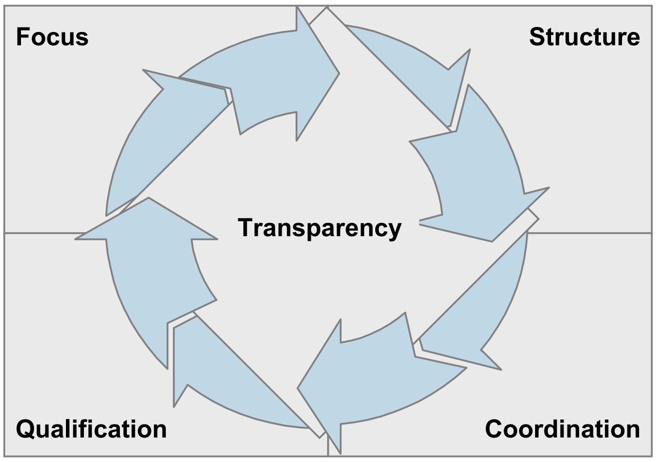


Figure 1: Categories of Complexity Measures

Product development

The early product lifecycle needs particular focus and structure. The allocation of resources to the development of products that cause high complexity needs to be carefully reviewed. These products need strict tollgate/stage-gate processes and their development should be approved by the relevant top management team, who need to take into consideration not just market potential but also the implications for complexity.

Research, Development, Marketing and Operations have joint responsibility for getting the configuration of new products right. Design for production, design for logistics and design for procurement are a major challenge for Programme Management and R&D departments – but careful management at this stage will pay off. By contrast, wrong decisions at this stage will result in increased complexity for years to come.

Product launch

At launch and during the early sales period, Sales and Marketing have a strong incentive to push products out to clients. They tend to modify products in an uncontrolled fashion according to requirements expressed by the customer (but which, on closer analysis, add value neither for the customer nor the customer's customer) in order to induce market pull for the new product. We call this the "unguided missile" approach.

Allowing the sales force to follow this logic will damage the company's profit line and also threatens its longer-term viability. Selling more in order to compensate for the lost margin will only lead to a further destruction of value. To avoid this vicious circle, complexity oriented management must be established. New variants should be introduced only in accordance with a defined structure and the degree of flexibility that Operations can deliver.

Product maturity

In the mature stage of the product lifecycle more emphasis needs to be placed on coordination and qualification of the organisation. During this stage new product variants are necessary to provide the market with fresh and exciting features. However, a continuous assessment of the existing portfolio, based on the cost of complexity and the value added by complexity, should take place to ensure value destroyers are either eliminated or their prices adjusted in cases where value for the customer is still higher than the internal cost of complexity.

Late product lifecycle

The late stage of the lifecycle cause specific problems for operations managers. System theory tells us that structures within a system tend to remain even when the original reason for their introduction disappears. This is what happens in mature industries, where complexity often causes severe difficulties and results in the need for significant restructuring.

Understanding complexity: Complexity Audit

To avoid severe operations failures, complexity has to be analysed before the operations system becomes stuck in the "complexity trap". Our experience shows that over-simplistic analysis of complexity often fails to identify the underlying facts and often results in bad decisions. To address this, Arthur D. Little has developed an integrated Complexity Audit (see figure 2). The core of the audit is an understanding of what drives a company's specific complexity and how this affects profitability.

Understanding company-specific dimensions and drivers produces a distinct set of complexity indicators (e.g. growth of organisational entities, growth of SKUs per sales). However, the audit also looks at the company's capability for managing complexity, asking questions such as "Does the company have the right management skills for globalisation?" and "Is the production network flexible enough to support product proliferation?"

For structured decision-making to take place this willingness to look openly and honestly at the company's capabilities is essential. The company's ability to create this type of transparency is, in itself, a measure of the company's capacity to manage complexity.

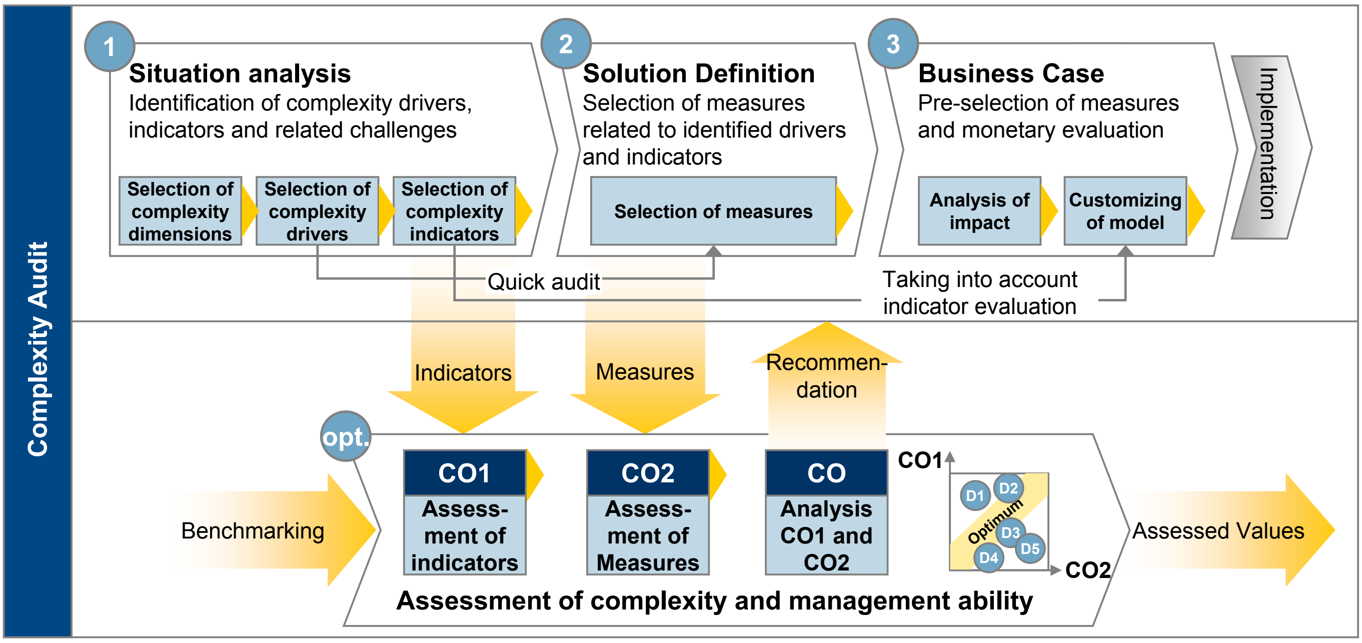


Figure 2: The Arthur D. Little Complexity Audit Approach (© Arthur D. Little 2005-2008)

Establishing a balance

The Complexity Audit delivers a set of complexity dimensions, drivers and indicators, which is then developed to create a holistic perspective on internal and external complexity drivers. For any company, the only way to remain viable in the long term is to maintain the balance between the magnitude of complexity its business requires (CO1) and its ability to manage this complexity (CO2) (see figure 3).

Companies can operate profitably at either end of the spectrum. Consider the low-cost airlines with their simple service offering and low-end service personnel. Compare this with the high-end service providers, such as Air-France-KLM or Lufthansa, who spend considerable resources on far more complex yield and operations management. Either route can deliver success, but every company needs to ensure that its ability to manage complexity matches the degree of complexity required by its business.

Without this balance, difficulties occur. If, for example, a company's customers demand a broad set of product variants while the company offers only a narrow configuration, its portfolio will not be competitive and competitors will take sales. A possible outcome of this analysis might be to increase the number of product variants while simultaneously augmenting process engineering capability for postponement/late-variant creation.

Another frequently occurring example is of customers demanding leading-edge supply chain processes, while the company is not even able to give reliable delivery dates ("Available to Promise"). This inability to

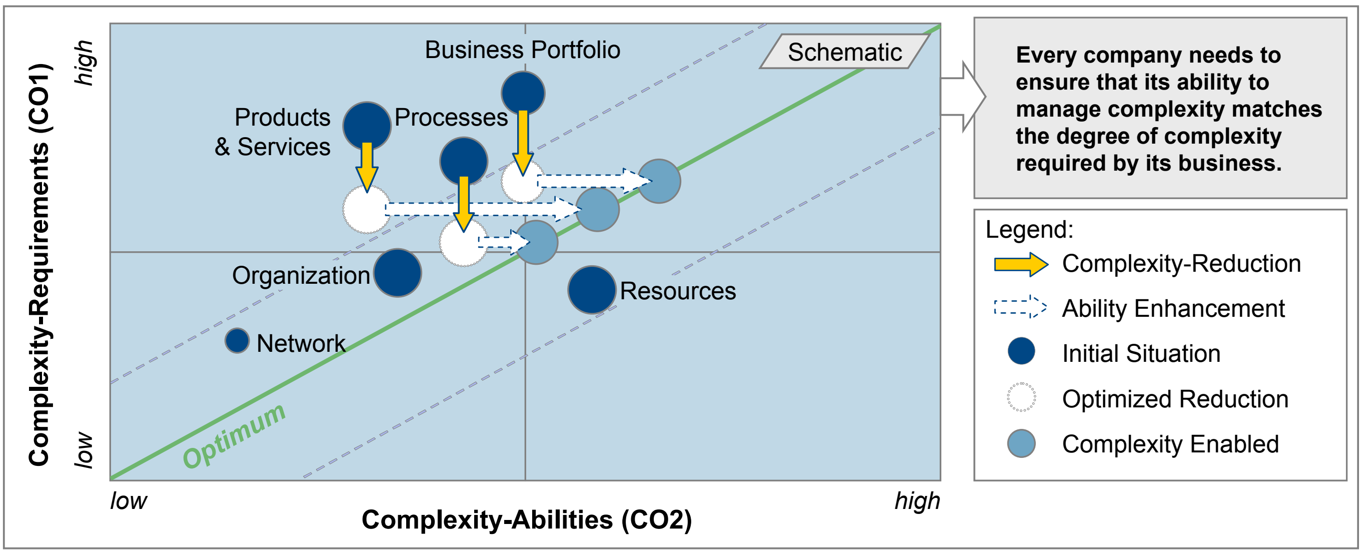


Figure 3: Complexity Portfolio (© Arthur D. Little 2005-2008)

manage complexity will eventually cause sales to decrease. A solution might be to improve planning capability while simultaneously outsourcing parts of the value chain and enhancing the company's ability to manage supplier relationships.

These simple examples indicate the importance of balancing complexity requirements and complexity-management abilities. Facing the challenge with a truly integrated set of measures is the key.

Long-term impact

Whatever the specific complexity challenges a company faces, complexity management is a major strategic lever for Operations Management. A little change in the system has long-term implications, much greater than can be computed in a typical five-to-ten-year business scenario. Introducing product platforms and product modularisation concepts today might pay off in five to ten years from an engineering point of view but, beyond this, the reduced complexity that results will allow Procurement to negotiate bigger quantities, Logistics to manage a reduced number of modules and Parts and Production Planning to be far more flexible due to a lower number of input factors.

Effective complexity management can deliver far more dramatic results than many more frequently applied interventions. It is a cross-functional approach and the yield multiplies the greater the number of disciplines, divisions and functions involved. By managing complexity effectively and drawing all the relevant disciplines into its strategy, Operations Management can turn the threat of complexity into a great opportunity.

Conclusion

Complexity Management is the major challenge facing Operations Management today. However, at Arthur D. Little we regularly find that companies do not understand their specific complexity challenges and are taking intuitive measures without understanding the whole picture and the impact on enterprise value. The various aspects of complexity – from external to internal, from value-adding to value-destroying – have to be understood thoroughly in order to build the optimal Target Operating Model.

Our comprehensive complexity management service includes the analysis of internal and external complexity and an evaluation of the complexity ability required by a company's operations. Based on this, and using Arthur D. Little's unique side-by-side© approach, we tailor the right set of measures for each client organisation. Our purpose is not to avoid or diminish complexity, but to find the right balance between the magnitude of complexity to be managed and the company's ability to manage it.

If you want to know more about how to master complexity in your value chain, please do not hesitate to contact us.

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About Arthur D. Little

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