Transforming construction operations to improve productivity

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Engineering and construction firms suffer from low margins and relatively low productivity. Here is how to do better.

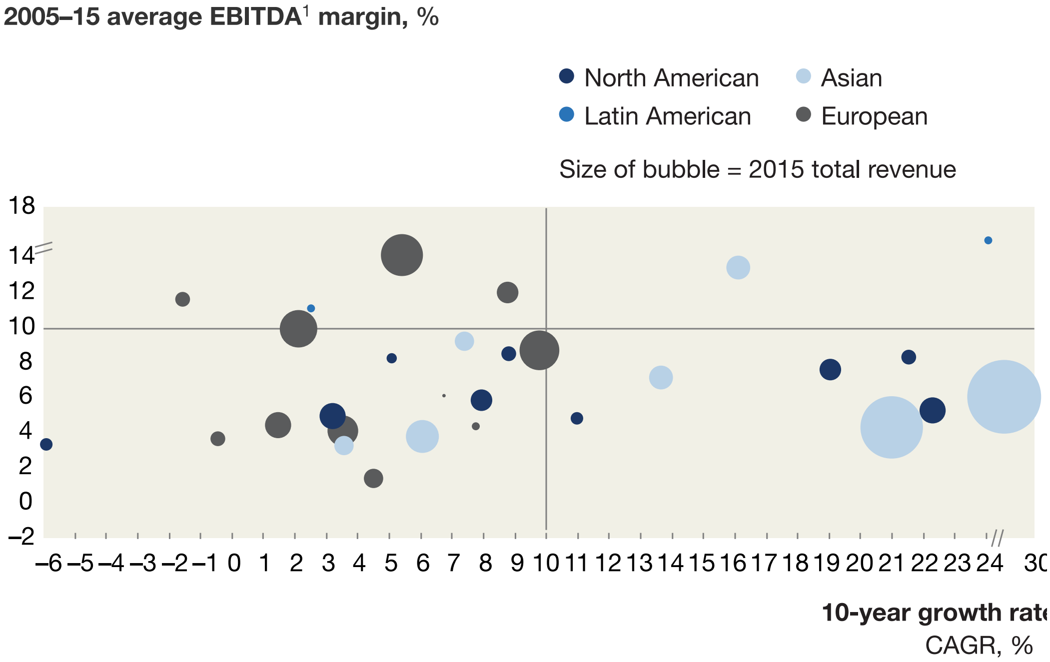
Infrastructure providers face a world of opportunity. The McKinsey Global Institute has estimated that $57 trillion in infrastructure investment will be required by 2030 just to keep up with the global economy. For engineering and construction (E&C) firms, that translates into a steady 4 percent annual growth rate. At the same time, projects and contracts are getting more complex, and clients are also ever more demanding.

No wonder, then, that the E&C sector in many markets is struggling with low profit margins and poor productivity. And when McKinsey analyzed the financial performance of 30 major public E&C firms from 2005 to 2015, it found that fewer than 15 percent had achieved consistent double-digit growth and EBITDA margins (exhibit).

These results are not as good as they should be. In this article, we describe the challenges the sector faces, both internal and external. Then we suggest specific actions E&C companies can take to do better—and in the process help to build the infrastructure a growing world needs.

Exhibit

Few companies have experienced both aggressive growth and sustained double-digit EBITDA margins.



Key averages:

	North America	Europe	Asia	Latin America
10-year growth rate (CAGR[2]):	10.4%	4.2%	13.9%	11.1%
10-year average EBITDA margin:	6.3%	7.4%	6.7%	11.1%

[1]Earnings before interest, taxes, depreciation, and amortization.
[2]Compound annual growth rate.

McKinsey&Company | Source: Organisation for Economic Co-operation and Development

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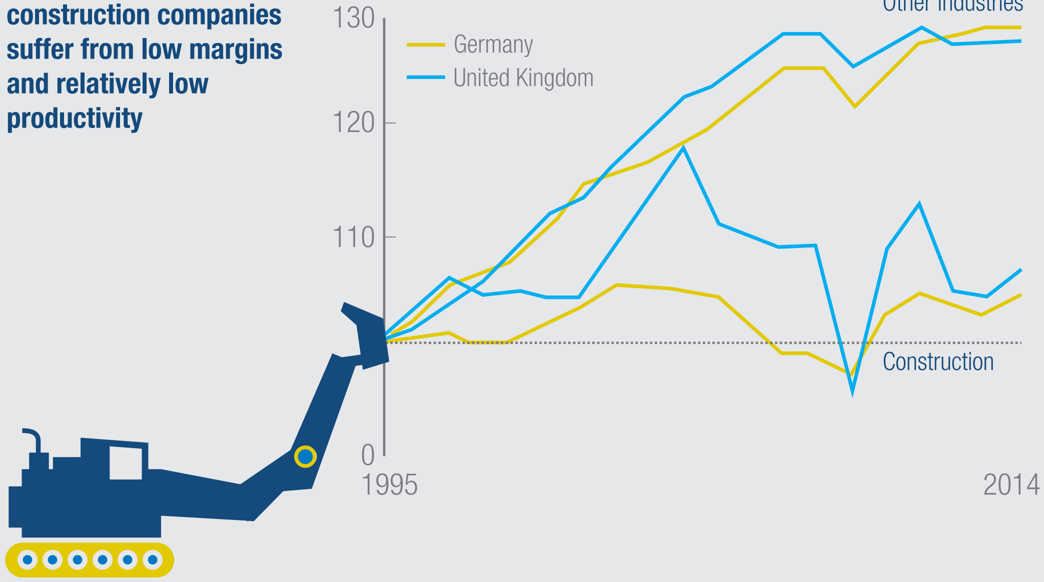
Beating the low-productivity trap: Transforming construction operations

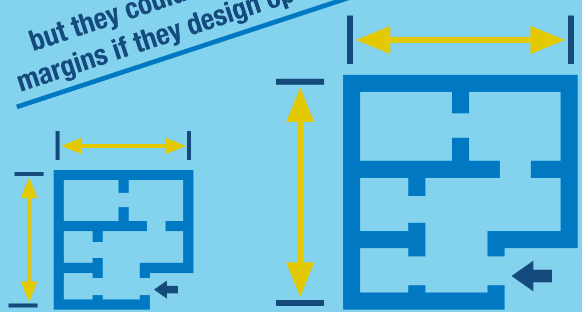
Engineering and construction companies suffer from low margins and relatively low productivity



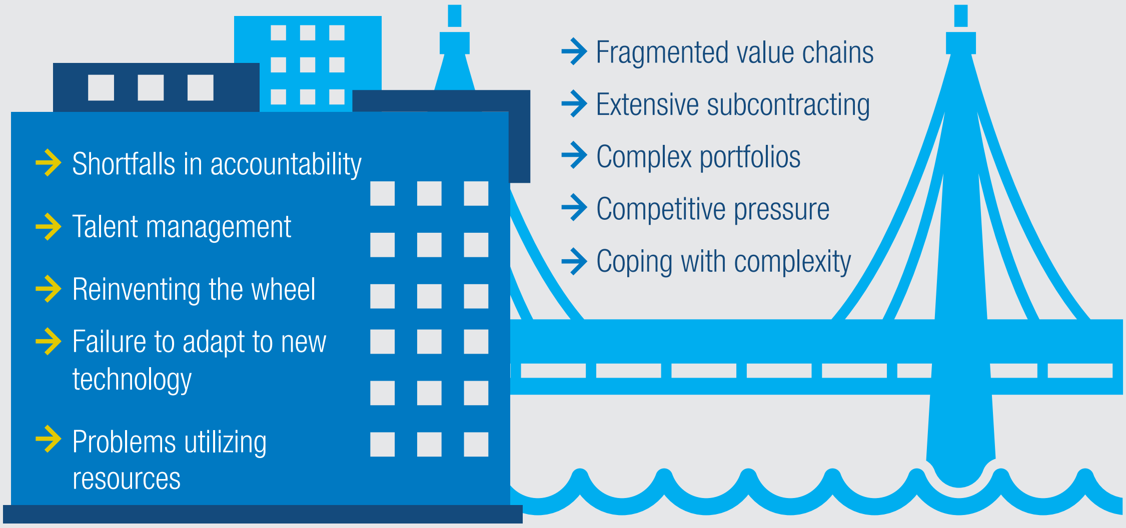
1 Gross value added per hour worked, constant prices based on 2010 prices
Source: Organization for Economic Co-operation and Development

Fewer than 15% of E&C firms had double-digit growth and margins from 2005-2015,

but they could achieve 20-30% operating margins if they design operations differently.



The industry faces internal and external challenges



But they can overcome the challenges and do better if they:

1. Articulate a clear set of values and targets
2. Build a development program for project managers
3. Create an integrated data system
4. Encourage speedy risk mitigation and decision making
5. Make project delivery teams more accountable
6. Standardize systems and practices
7. Create an integrated and transparent performance management system
8. Minimize the number of changes

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The internal challenges

A number of common flaws, outlined below, impair the performance of E&C firms; together, they create a culture in which innovation cannot flourish.

Shortfalls in accountability: Organizational structures are often unclear, so that no one takes responsibility for results. Moreover, financial incentives are often not aligned with the project goals. Staff will be more motivated to finish on time or early, for example, if there is a bonus associated with doing so.

Talent management: E&C firms everywhere complain of skills shortages; few are able to develop talent from within. In addition, many people do not want to work in difficult or risky regions. Finally, E&C firms have resisted hiring people from outside the industry, limiting the sector's ability to reinvent itself and to learn from others.

Reinventing the wheel: Too often, business units and megaprojects are run as if they were independent companies, without consistent performance management. By not standardizing operations and project reporting, companies do not manage their risks as well as they could and do not scale up best practices.

Failure to adapt to new technology: Some firms have tried to adopt innovative approaches to enhance productivity, such as advanced building-information modeling (BIM).[1]

Most E&C firms, however, have legacy systems and unique client requirements when it comes to budgets, planning, and operations. That makes change difficult.

Challenges to resource utilization: As E&C companies have grown and diversified, they have had to deal increasingly with internal silos linked to geography and business units and/or asset classes. The result is that they struggle to use their resources effectively.

The external challenges

Outside factors can also make it difficult for E&C firms to improve their efficiency and profitability.

Fragmented value chains: Along the project life cycle, there are many different players, including owners, designers, contractors, and quality control and safety experts. The problem is that they do not always work together well. For example, typically, each entity gets its own contract, with no overall management. In effect, one participant can (and often does) create problems for the next one.

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[1] 5-D building-information modeling (5-D BIM) refers to adding two more metrics (schedule constraints and cost) to traditional 3-D computer-aided-design models.

Extensive subcontracting: Many subcontractors are small and unsophisticated, lacking effective governance and talent management—and the firms that hire them have not seen it as their responsibility to improve matters. That affects productivity at every stage. Also, E&C firms typically want the subcontractor to accept most of the risks, an attitude that does not foster a spirit of collaboration.

Complex portfolios: International expansion means that companies are faced with different business conditions and partners. This can lead to an even more atomized way of working because they need to build up regional knowledge. The variety of local regulations makes it more difficult to standardize operations.

Outside pressure: Chinese, Korean, and European companies in particular are making great efforts to find work in high-growth markets. This heightened competition is forcing once-dominant local players to raise their game at a time when other kinds of pressures are also building, such as tougher environmental and safety standards.

How to do better

Successful E&C companies set appropriate goals, learn from their mistakes, and embed these lessons into the next project. To boost margins and productivity, then, here are the priorities:

Articulate values and targets: This may sound basic, but many E&C companies find it difficult to estimate baselines; that makes it all but impossible to make accurate plans. Creating a culture of measurement and precision on estimates is essential. Successful E&C firms promote this mind-set by tying performance bonuses to specific metrics in project execution. This ensures that the staff and the company have the same goals.

Build a development program for project managers: To promote excellence, encourage continuous improvement, and increase personal accountability, firms should design a career plan for project managers. Even smaller firms can do this through mentorships, well-designed performance evaluations, and feedback mechanisms.

Create an integrated data system: Firms need to have a single database that shows the most important metrics, such as construction progress and real unit costs. At the moment, the usual practice is that each stage—planning, design, procurement, construction—has a separate data base.

Encourage speedy risk mitigation and decision making: Working with the business-development and operations teams, E&C firms need to create effective programs that illuminate the riskiness of the portfolio as a whole. The current norm is to think of risk on a case-by-case basis; the better approach is to see how each project fits into the company's operations as a whole. For example, if a firm decides to bid on a project offering a 10 percent discount on its usual profit margins, then other projects will have to make up the difference.

Increase accountability of project-delivery teams: This effort has to begin at the beginning—establishing what the team is meant to do before it gets to work and choosing people who can accomplish those goals. It could be helpful to create a standard project charter that defines roles, responsibilities, and lines of reporting, and to establish a clear documentation system.

Standardize systems and practices: In the E&C sector, there is a tendency not to use standard solutions, even when they clearly work. E&C firms should seek to ensure that each project maximizes the use of the best features from other projects; doing so can significantly reduce procurement costs and execution times.

Implement a "stage gate" process to minimize project changes: This identifies the specific points where project objectives are approved and can help to keep changes to a minimum, through such mechanisms as change reviews and the allocation of responsibility for approving changes.

Conclusion

By setting a clear vision, strengthening talent management, and improving their processes, E&C companies can improve their performance and operating margins.

Getting started requires understanding a company's potential and areas of strength, and then setting priorities. The commitment must come from the top. Even executives who accept that they need to do things differently, however, have tended to focus their efforts on improving specific functions, when an end-to end approach is needed. For most firms, this will require a fundamental change in thinking, by emphasizing profitability rather than resource utilization and by being more selective on the work they target.

Those that make this shift, however, will put themselves in position to win.

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