



“The Construction Industry Needs to Rediscover its Process Quality”

Prof. Christoph Motzko of the Technical University of Darmstadt, is both an advocate and a guide for the German construction industry. The professor is currently researching such issues as the “real-time management of construction processes” at the Institute for Construction Management. For a year, the institute has been cooperating with Porsche Consulting in the field of process optimization. In the following interview, Prof. Motzko talks about the current situation in the construction sector, the new challenges, and the importance of lean processes to the entire industry.

📄 Reiner Schloz, 📷 Markus Leser, Porsche

Professor Motzko, let's do a popularity rating, on a scale from one to ten. Where does the construction industry stand?

Motzko: “If by that you mean image, I don't think the overall reputation of the construction industry is bad. But if problems arise in the construction of a public building, media coverage is often heavy. People remember such things. The industry's image also suffers from quality problems, which no doubt do exist. On the other hand, construction is a real and necessary thing, and so I think that makes it popular.”

Clients complain about quality defects, the construction industry complains about too much responsibility coupled with ever-smaller margins. Doesn't this all sound like a real crisis?

Motzko: “A ‘real crisis’ implies the threat of collapse. The existence of the construction industry is in no way under threat. It will always remain an important industrial sector in developing national economies. Incoming order placements rose in Germany during the first quarter of 2008. The markets for construction projects and construction services abroad are also functioning well.”

But if we're talking about profits, the construction industry isn't exactly a top performer.

Motzko: “That is indeed a problem. One aspect is the very tight planning and execution deadlines, the intense competition, and, last but not least, the rocketing prices of construction materials and services. In May 2008 alone, the price of concrete steel rose by 35 percent as a result of the colossal construction activity going on in newly industrializing countries like China and India. The German construction industry has to accept these challenges, because this is an industrial sector that is urgently needed.”

So you still see a great future for the industry?

Motzko: “Of course. Let's take the example of Porsche. The company should have an intrinsic interest in good roads, so that the spirit of its products can be experienced to the full. As a basic principle, a society relies for its development on an intact infrastructure and a sustainable construction culture. This is particularly true of an exporting country such as Germany.”

What is the role of the construction industry in this?

Motzko: “It has an important role, and one that is in constant metamorphosis. The post-war years and the period of German reunification were characterized by reconstruction, in other words mostly new building. Comfortable traffic routes, clean drinking water, warm rooms in winter—we take all these for granted. And they are all associated with construction work. Developments on our planet are changing the profile of specifications, and some companies have reacted to this. The construction industry has to provide answers to questions connected with such things as climate protection, the conservation of our natural resources, demographic changes, and the joint financing of public works.”

How can that be done?

Motzko: “The ambitious targets for reducing greenhouse-gas emissions can only be achieved by exploiting the enormous potential for energy-saving in buildings. That means aggressive refurbishment, and the development and construction of buildings that are self-sufficient in energy. Linked to this is the optimization of the traffic infrastructure, including the deployment of private capital, and another aspect is the recognition of the recycling-based economy. Building adaptation can make a vital contribution in all these problem areas.” ▶



The art of construction: At the new Porsche Museum, steel and concrete must meet specific demands for structural stability

What does this mean for the construction industry, and for the planning and realization of future construction projects?

Motzko: “Today’s builders see themselves as service providers within the life cycle of a structure. When a building is erected today, consideration should already be given to the need to adapt or dismantle it in twenty years’ time. By implication, this means that building adaptation must be integrated into the planning process at a very early stage. Strictly speaking, a wise planning process should integrate the demands of the production and operating processes, and hence building adaptation.”

To what extent can the methods of lean management support the construction industry here?

Motzko: “The culture of sub-sub-contracting has un-

doubtedly led to a certain loss of identification with one’s own building work in recent years. Orders have also been placed with the cheapest bidders, rather than the best. A certain loss of structural quality is evident as a result. Lean management makes the customer and quality the focus of work. It promotes keeping to schedules and enables much better process management. These are important characteristics that are relevant for the construction industry.”

What changes are needed in practice?

Motzko: “With suitable work preparation, these methods already take effect in the early planning stages. Processes are completely planned out and optimized with the involvement of the necessary experts. An important part of the work must therefore be done in advance, and with considerable investment, so that plan-



ning and execution can proceed at high quality, in other words, as per the contract.”

But does a good plan in itself guarantee an exemplary building?

Motzko: “No. So process management is another important ingredient in lean management. Our research in the field of real-time management of construction processes also substantiates this. The joint work with Porsche Consulting in the field of process optimization was an important element of this research. The processes were defined and the entire flow assessed and directed in short cycles. The automotive industry has cycle times of a few minutes per station in production. In construction, we can at least implement one-day cycles. Consistently applied, this ensures high process transparency. Dead-

lines, costs, and quality become clearer when the right tools are used. Glitches are detected early, and ideally, malfunctions no longer occur. I think the developments in this field are very exciting.”

But it’s also true in construction that people don’t like changing and giving up their habits...

Motzko: “In our industry, there are many good companies that are doing everything or almost everything right by intuition. But not all companies know what to do. A few have discovered lean management for themselves, and use services like those of Porsche Consulting. But more extensive changes are needed. Standardized procedures can provide essential support here, determining the work process from the initiation of planning through to building approval, and providing a solid foundation for subsequent operations. There is great potential there.” ▶



Prof. Motzko: “The construction industry must stabilize its processes”



TU Darmstadt: First Free University

A noble tradition in the spirit of scholarship: The Technical University of Darmstadt has been a university with an international focus since its founding in 1877. Since January 1, 2005, it has been Germany's first uni independent of public sponsorship. This means that a powerful Board has the responsibility for budget, staffing, and construction, in consultation with the higher education board, the university assembly and the state government. The research and teaching profile encompasses engineering sciences (50 percent), natural sciences (35 percent), and humanities (15 percent).

The Institute for Construction Management at the Technical University of Darmstadt was founded in 1979, and is an interdisciplinary research field within the Faculty of Civil Engineering and Geodesy. Professor Christoph Motzko has much practical experience, and understands

the problems of the construction industry. Therefore the focus areas for research are process engineering, management and organization, simulation, controlling, and public real estate management—with the goal of achieving better process quality in the life cycle of structures. Eighteen research projects are currently ongoing.

The Cooperation with Jörg Kaiser, principal at Porsche Consulting, is intended to enable the use of intersectoral experience. Kaiser is currently working on his doctorate in lean construction at the Technical University of Darmstadt.

The photographs accompanying the interview show the new Porsche Museum construction site in Stuttgart-Zuffenhausen. It is a prime example of how high the demands on the construction industry have become.

So what is your advice to the construction industry for the implementation of future projects?

Motzko: “The construction industry must first define strict processes, and stabilize them. With that, process optimization—or, as in the automotive industry, the process of continual improvement—can take place. This philosophy must include planners, subcontractors, sup-

pliers, and other project participants. Its application determines how particular characteristics are fulfilled and how disciplined the implementation of clear just-in-time principles is. Because one thing is certain: the construction industry has to rediscover its process quality.” ◀



The Porsche fascination: The 356 and the 550 Spyder cut a fine figure at the Museum construction site in Zuffenhausen