Software engineering

A revolution in automation software

Each new machine or plant is expected to be more flexible and more efficient than the one that came before it. When it comes to achieving these ambitious development goals on time and on budget, software engineering plays an increasingly decisive role. This is where mapp – modular application technology – from B&R comes in. Using mapp function blocks, this revolutionary technology reduces development times by an average of 67%.

Photo © B&R

mapp TECHNOLOGY

Christoph Trappl
International Applications Manager, B&R

"With mapp, it is possible to accelerate development of new machines and systems by an average of 67%."

"Over the last few decades, the proportion of software development involved in new machinery and systems has skyrocketed from 5 to over 50 percent," explains Christoph Trappl, manager of International Applications at B&R – and it shows no sign of slowing. Trappl sees several reasons for this trend: "First and foremost, the production processes themselves are becoming more and more complex – especially in light of the increasing mass customization of products," he says. Purely mechanical solutions make it hard for machine builders to keep up with these new demands. At the same time, they want to protect their valuable expertise. "The mechanics of a particular solution can more easily be analyzed and reverse engineered, but this is virtually impossible for the software component," says Trappl.

Qualified software developers few and far between

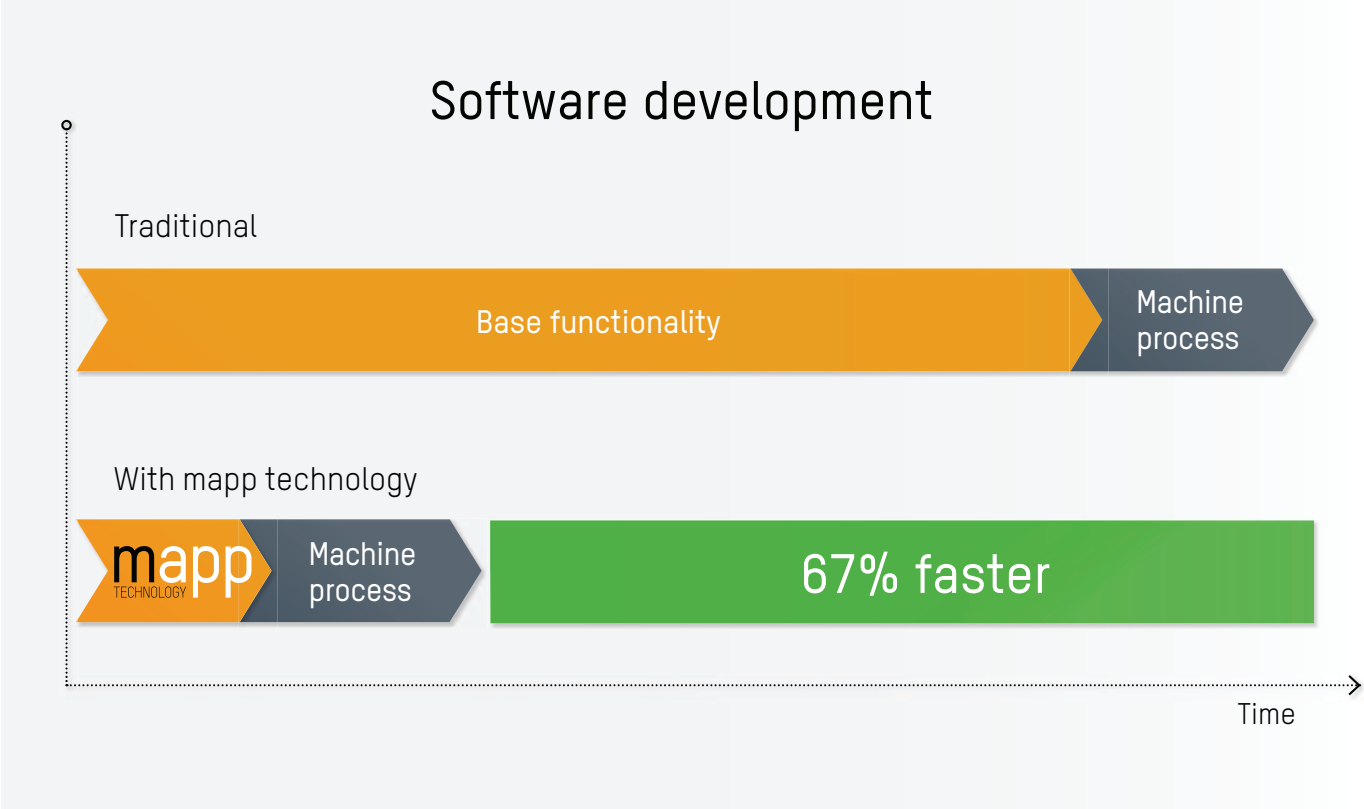
The increasing demands on software mean that more and more highly qualified software designers are needed. "This is a problem for many companies," explains Trappl, "since finding these kinds of developers is difficult and expensive." In his estimation, future demographic developments will further exacerbate this problem.

Cars may have once enjoyed their role as the sole products individualized for each customer, but this time is long past. The oft-quoted "batch size one" is becoming increasingly important even outside the consumer market. The trend towards mass customization means that, when it comes to development, the role of software will only continue to grow. As this happens, Industry 4.0 will turn from vision to reality. Manufacturing individual products under mass production conditions will require intricate software solutions.

And even though the software required for these types of projects will continue to become more complex, more extensive and more individualized than ever before, there will nevertheless still be those functions that will always recur. This not only includes tasks like controlling single- or multi-axis systems and general administrative features such as recipe management, but also control functions, recipe algorithms and much more. Just ensuring the base functionality of the software requires a considerable investment in both time and money.

The advantages

- 67% faster development time
- Reduced investment risk
- Increased machine availability
- Lower maintenance costs



With mapp technology, machine and system manufacturers can concentrate on developing crucial machine functions. Basic functions do not have to be programmed because simple configuration is all that is necessary.

Development time reduced by 67%
Reducing this investment is exactly what Trappl and his team had in mind when developing the modular mapp concept. Thousands of field-proven B&R applications from around the world provided the necessary benchmarks. "Our goal was to put a toolkit into the hands of development engineers that would allow them to design their own high-end software solutions without any additional special knowledge," explains Trappl. "And that's exactly what we've done with mapp."

What sets mapp function blocks apart is that they are extremely easy to configure and relieve the developer of having to program every single detail. They make it possible to implement multi-axis systems coupled via cam profiles or electronic gears, various robot kinematics, closed loop control blocks or recipe management functions – and much more – in a matter of just a couple hours.

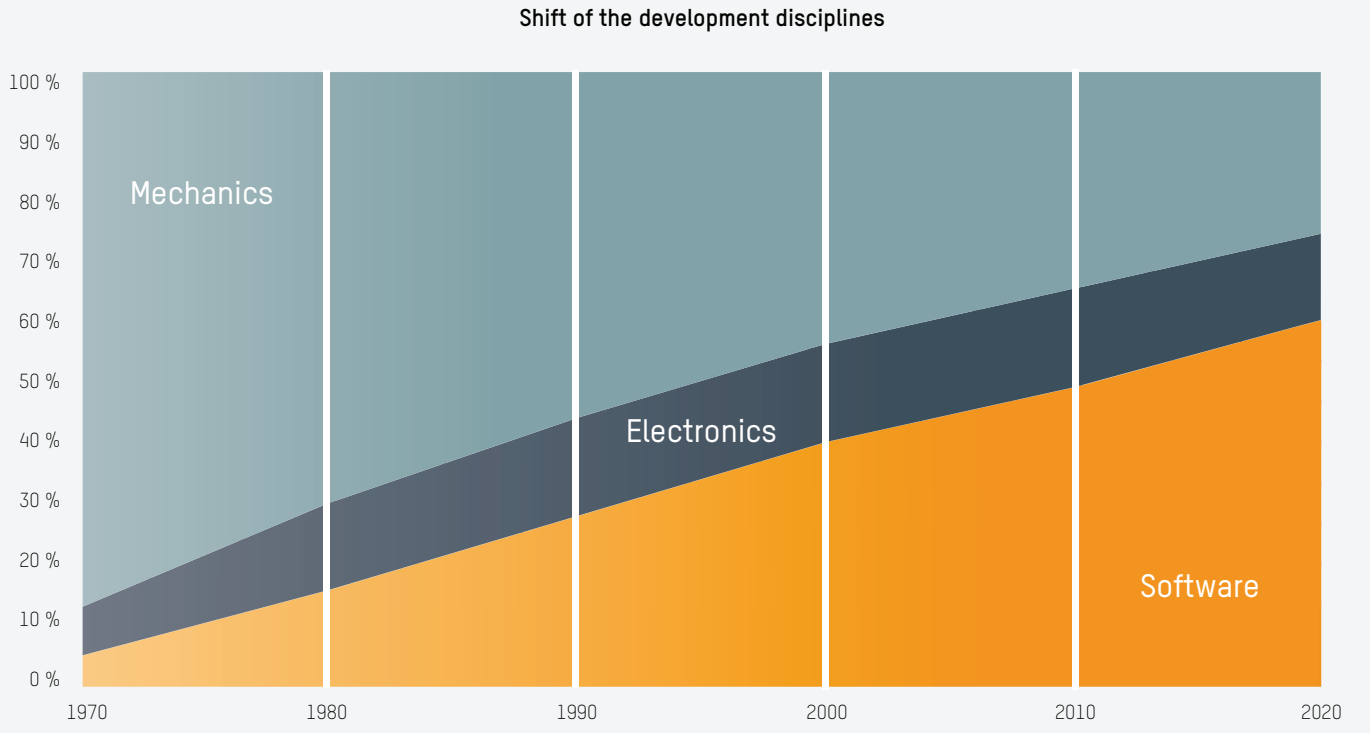
Also included is a web-based tool for monitoring and configuring mapp functions. With mapp, it has proven possible to reduce development times by an average of 67%.

Drastically reduced project risk
mapp is fully integrated in Automation Studio. After completing a short basic training course, any developer will be able to employ mapp functions with ease. What this means for small companies is that they too will be able to implement complex software solutions without having to worry about garnering the necessary resources themselves or risking development gone wrong.

"The investment risks are drastically reduced with mapp," says Trappl. mapp function blocks have been developed from the experience gained by B&R in implementing hundreds of thousands of automation solutions all around the world, making them extremely reliable. With mapp, machine downtime due to programming errors is a thing of the past.

Increasing efficiency by focusing on core competencies
"The customer shouldn't have to worry about basic functions or software maintenance," says Trappl. "He should be concentrating instead on his core competencies as his process know-how is quickly turned into software. The most important thing for him is innovation; it's our job to supply the basic functionalities." The gateway hurdles usually involved in implementing complex software are reduced to a minimum with mapp technology.

A further contribution to increased efficiency comes from reduced maintenance costs, thanks to thorough field-testing and ongoing maintenance of the mapp function blocks by B&R. Full documentation and help functions complete the mapp toolkit. And when in doubt, you can always count on B&R's expert support team.



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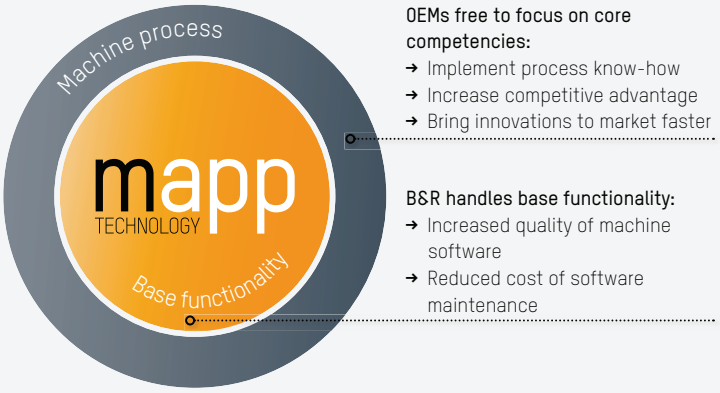
Safeguarding engineering know-how

"A dilemma that many companies face is that the bulk of the engineering know-how is held by only one or two developers," says Trappl. If one or even both leave the company, not only do current projects suffer, but it also becomes impossible to maintain and update applications that are already in action. "This can't happen with mapp," assures Trappl. "The functions themselves are very transparent and extensively documented."



Unlimited scalability

mapp is perfect for low-end and high-end machines alike. Either way, the complete modularity and scalability of the B&R product portfolio means that mapp function blocks do not even have to be reconfigured. Once a machine has been developed, it is simply a question of replacing the HMI devices, controllers and drives to adapt to the demands of a particular market.

With mapp, B&R has developed a revolutionary new package for the development of automation software that makes it possible to accelerate projects by an average of 67%, while at the same time substantially reducing investment risk. At the introduction of mapp in November 2014, more than 70 blocks will be available. "Beginning today, it is possible to design software solutions for many extremely complex functions with less effort than ever before," says Trappl. "We're not about to rest, though.

As we speak, our team of developers and maintenance specialists all around the world continue to expand our portfolio of mapp blocks to meet the demands of the future." The latest mapp function blocks can be downloaded conveniently from the B&R website as they become available.

Your local B&R representatives will be happy to organize a mapp presentation for your company. ←