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**MODULAR MATRIX MAKES  
INDIVIDUAL WISHES AFFORDABLE**

# UNIQUE VERSUS UNIFORM

Actually it doesn't pay off: customers are demanding ever more individualized products, higher quality, and unfailing delivery—and rock-bottom prices at the same time. This is generating harsh competition among companies, whose options are already limited given the enormous price pressures from globalization. The only way out is to make products and processes even more efficient. And to consistently eliminate all unnecessary complexity.

Felix Wolf, a maker of men's suits, learned this the hard way. That was not his intention, but it has in fact paid off. Today he sells made-to-measure suits using a modular matrix (in German often called a "Baukasten"). These comparatively low-priced but high-quality items are selling like hotcakes.

 KATHARINA BECKER  OLAF HERMANN

**G**rey is always good. Black usually works too. Blue as well. The well-lit loft with black walls contains rack upon rack of men's suits. Customers seeking comparatively affordable prices at "FELIX W." men's clothing stores in Stuttgart, Munich, or Zurich will find understated elegance—often in the form of complete packages including the right shirt, tie, and handkerchief for a two-piece suit. Fashion advice is provided free of charge, as is espresso. The main store sells around 10,000 suits a year. Instead of settling for products off the rack, customers put together their own suits with the help of expert advice: relaxed or snug fits, simple or flashy linings, narrow or pointed lapels. While costly tailor-made suits might fit like a glove, patrons of made-to-measure clothing à la FELIX W. try on different ready-made components of jackets and pants from a modular suit matrix until everything fits. True, a tailor-made suit would fit to a T, but one from this modular matrix comes very, very close to that ideal.

When the Felix Wolf fashion company launched its modular matrix strategy in 2008, the first thing it did was to flop. Business associates had been excited about the possibility of greater flexibility and lower costs that could yield attractive, individualized products for customers. It can't be that hard, Wolf thought. "So we took our somber suit factory and turned it into a workshop. The first thing we did was to paint all the rooms white: not just the walls but also the floors, and even the sewing machines—everything, in fact. That was considered terribly chic at the time. And we purchased top-of-the-line machines at outrageous prices." But white and spotless were not enough on their own. Wolf shakes his head on recalling that period. "We were enthralled by the technical

possibilities and we underestimated the complexity," he explains. The virtually unlimited permutations of shape, components, and alteration for customers sent costs soaring. Three or four seamstresses could not meet the quality offered by tailoring operations with specialists for everything from collars to button facings. All in all, a modular matrix is a good concept, but it only works if it can be put into practice with the right strategy and requisite efficiency.

Companies that don't manage to master the sheer variety of customer desires will run aground on their own degree of complexity. "Each new variant costs money—in purchasing, sales, logistics, production, and even invoicing," says Frank Seuster, principal product optimization at Porsche Consulting. "The trick lies in keeping internal variety under control in order to offer attractively priced products." There are different ways to manage complexity, including common parts strategy, module, and platform strategies, as well as the modular matrix familiar from the automobile industry (page 33). The Swedish furniture company Ikea, for example, uses a common parts strategy wherever possible in order to reduce product complexity. The same screws, plugs, and shelf mounts can be found in all of Ikea's bookshelves, kitchen cupboards, and bathroom cabinets worldwide.

Both the module and platform strategies seek to generate as many synergies as possible. Modules are independent functional units used as a common basis for as many products as possible. A modular matrix, however, can achieve a considerably greater range of variety—from the same low degree of internal variety. This principle can be applied to different industries, from shipbuilders to machinery makers, and from chemical companies to producers of everything from prefabricated homes to muesli. The "mymuesli" company, for example, lets customers create their breakfast cereals at the computer from over 80 ingredients including amaranth flakes, chocolate-covered espresso beans, shredded coconut, and walnuts. The 566 quadrillion possibilities will exceed the lifetime capacities of even the most determined breakfast lover.

"A modular matrix combines platforms, modules, and common parts within a shared architecture," says Seuster. It all starts with the question of what the customer wants. When lists of products with their special features and individual parts start covering entire walls, the excessive complexity simply cannot be ignored. "It often happens that 95 percent of a product's variants account for only five percent of total sales," notes Seuster. Following this "aha" experience, the Viega company streamlined its range of sanitary and heating systems with the help of Porsche Consulting, reducing some of its variety by more than 30 percent. Moreover, it no longer needed to expand its high-bay warehouse. The lower level of administrative costs freed up resources that are now being used to develop new and innovative products.

Once the product range has been streamlined, the next step is to design the structure of the modular matrix. The first question that must be answered is what product features must be varied in order to meet different customer needs. Another question is what can be standardized without turning customers off. A modular matrix is therefore designed to allow product variants to be configured in a simple →

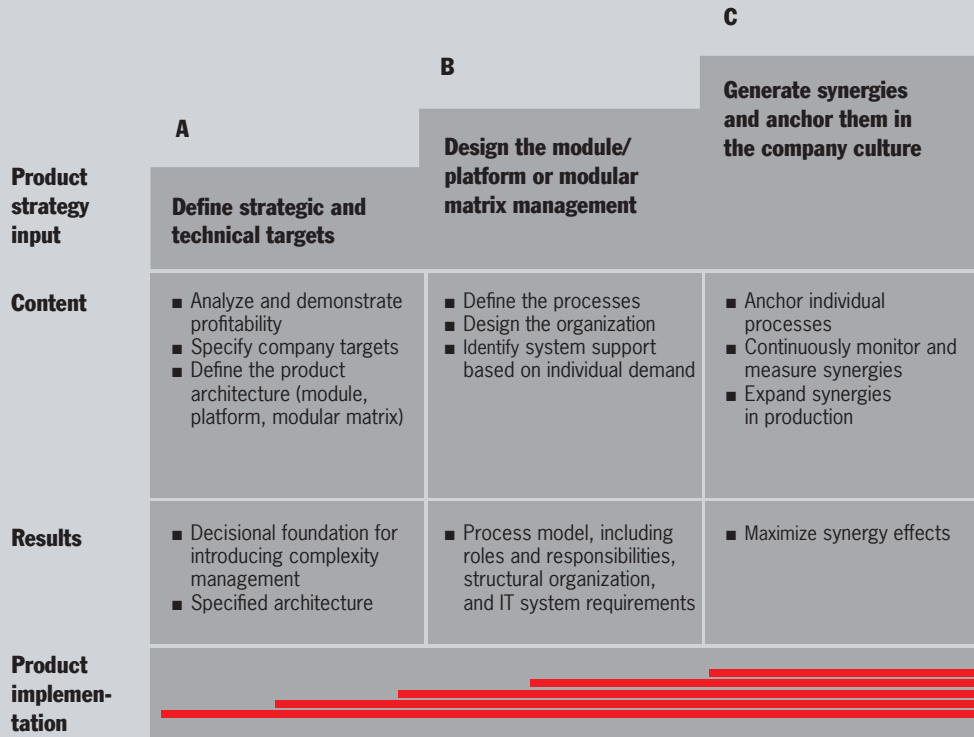


**Stuttgart-based clothing entrepreneur Felix Wolf uses a modular matrix principle to offer customers made-to-measure suits and shirts. Despite the rocky start, the business is now profitable.**

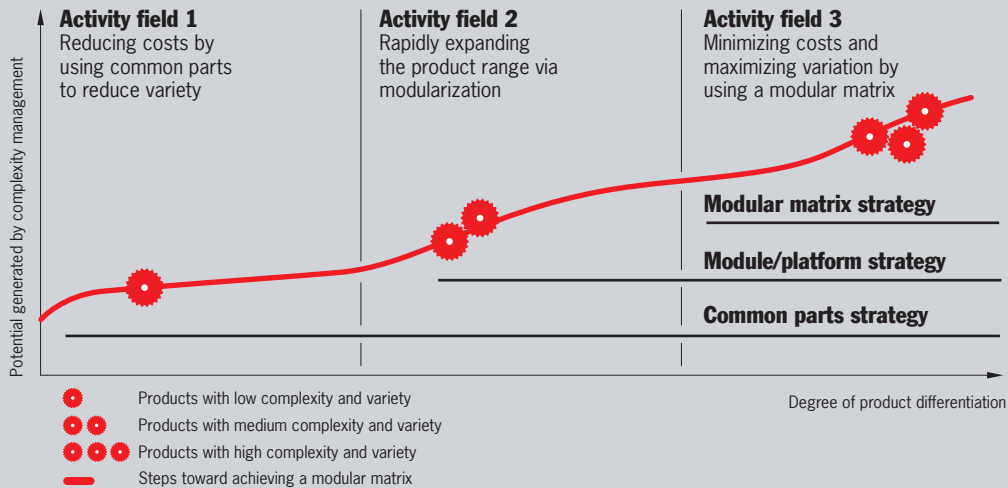


A modular matrix follows clear rules to keep internal complexity under control. A tightly fitting jacket, for example, uses precisely specified figures for minimum and maximum chest circumference. The interfaces are also defined, such as where the sleeves and collars are placed, and where stitches or adhesives are used.

## Three-stage reduction in product complexity



## To set up an efficient complexity management system, three main fields of action are delineated



## SUCCESSFUL COMPLEXITY MANAGEMENT STRATEGIES

### COMMON PARTS STRATEGY

In common parts strategies, components are planned from the start for use in a number of different products. This saves development and production costs. Components are not altered, and even retain their ID numbers.

### MODULE STRATEGY

A module strategy breaks down the overall product into independent functional units: modules. They can be used in different products by means of defined interfaces. The individual modules are generally largely self-contained, yet function as a unit in the end product. Modules are predominately used within modular matrices, because their high degree of combinability enables a wide range of product variety to be generated from a low degree of internal complexity.

### PLATFORM STRATEGY

The platform idea comes from the automobile industry. A platform combines components and modules into a shared structure. For example, Volkswagen has used the Golf platform to make models such as the New Beetle, Bora, SEAT Leon, ŠKODA Octavia, Audi A3, and Audi TT. This shared basis also enables new car variants to be developed and even produced on the same assembly line.

### MODULAR MATRIX STRATEGY

The modular matrix is an overarching organizational structure for platforms, modules, and common parts. Its basic principle consists of high external variety with sound internal manageability. The trailblazer here is the automobile industry, which uses different engine assemblies, axles, brake systems, air-conditioning, or navigation systems to configure new car models in rapid, flexible, and profitable ways. Making a new car does not mean redeveloping every single part. Instead, a modular matrix can employ both modules and common parts and thus achieve high synergy effects.

manner. An example from the automotive industry would be car seats. Whereas one customer might be satisfied with the basic seat, another wants a comfort model, and yet another selects a sports seat with enhanced side support. The seats need to be manually or electrically adjustable and are available in different colors and fabrics as well as leather. The solution is to offer seat covers in all materials and colors, both manual and electric drives, and the foam in basic, comfort, and sport versions. The seat structure itself, however, with its high development and tooling costs, remains the same.

A modular matrix enables modules to be used across a large number of different products. For developers and designers, this might sound like a straitjacket that leaves them no room to breathe. “On the contrary,” says Sven Schärffe, principal lean development at Porsche Consulting. “It’s a matter of channeling creative potential and developing new modules that can do things we can’t even imagine today. In other words, the aim is also to anticipate the future right now, so that when the day comes we’ll be able to bring our products onto the market faster than anyone else.” In addition to the product architecture, the processes themselves as well as their organization and strategy usually have to be adapted—which means that a modular matrix also requires an overall business approach. “All the departments—from development and production to sales—have to work closely together here,” says Schärffe. “Processes, hierarchies, departments, targets, and incentives have to be adapted to the modular matrix principle. We make optimum use of existing structures and improve them on a continuous basis.” To achieve the best possible solution, the consultants scrutinize the company and product strategies, and examine interfaces, decisional processes, and organizational structures—in every region and market. “The employees have to be on board every step of the way,” says Schärffe. “Modular matrix management only works when everyone in the company makes the principle come alive, and also knows why they’re doing so.” To keep costs as low as possible, it’s a good idea to gradually introduce the modular matrix principle.

Back to the nearly tailor-made suits. After one and a half years of experimentation, clothing entrepreneur Felix Wolf pulled the plug on the project and started anew. As he notes, “We learned the hard way that this type of system takes a lot of preliminary work.” Today his modular matrix is tautly organized. “We have internal rules about what is and isn’t possible, and clear rules for customers as well.” For example, customers can choose from among five different types of shirt collars: from cutaway to button-down. But the height of the collar can only be adapted to a limited degree, and the tip of the collar has a fixed angle. The customer specifies whether the suit should be relaxed, snug, or tightly fitting. The pieces for the torso, however, are based on conventional clothing sizes. This can mean a surcharge for customers with an imposing mid-section, for example. The shirts are currently made in Portugal and the suits in Turkey, while the workshop in Stuttgart is used for prototypes and small-scale series. “It took a while,” says Wolf, “but we are now making good money with our modular matrix.” ←

**One of a kind versus off the rack: the modular matrix enables customers to design their own customized shirts.**



