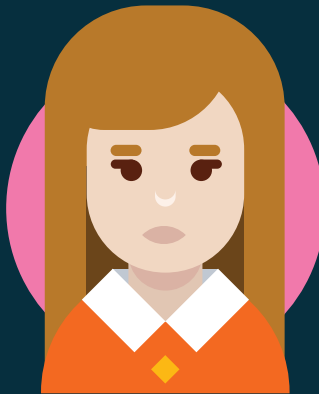


CONNEXXT

INDIVIDUALITY: A KINGDOM FOR EVERY CUSTOMER



PRINT

Are we soon going to print our spare parts?

USE

Trend to payment by use

RELAX

Five tips to relax mentally in minutes

ADJUST

Products for "Generation Me"



08

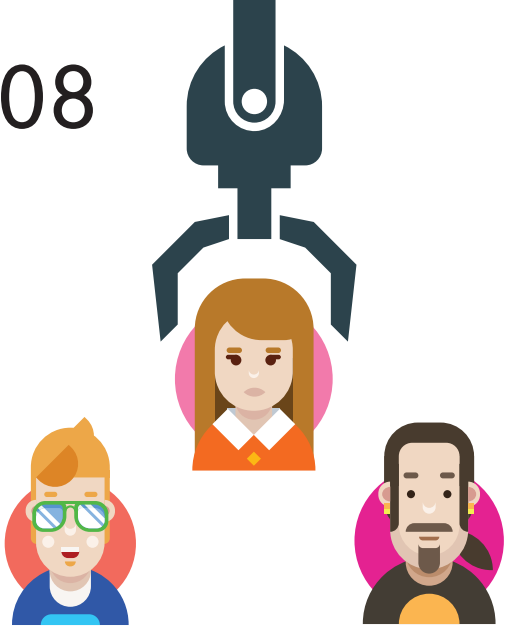


Photo: Siemens AG, Munich/Berlin

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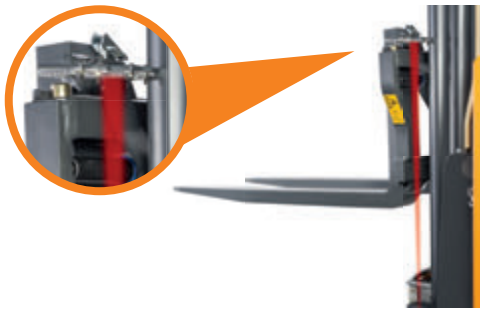
Mutant Vehicles

If you do not want to visit the “Burning Man” in Nevada, the worldwide shrillest art and music festival on foot only with your tent and backpack, but take a vehicle, you will have to submit your application to the DMV authorities about six months in advance. DMV does not refer to the “Department of Motor Vehicles”, the regular vehicle registration authority in the USA but to the “Department of Mutant Vehicles”, the respective registration authority of the festival. A quick glance at the crazy-fantastic vehicles makes instantly clear what the term “mutant” refers to. The photo of the probably most extravagant means of individual mobility was taken by the Hamburg-based photographer Alexandra Lier. For the complete series, go to: www.alexandralier.com/#/mutant-vehicles





NEWS



STILL REACH TRUCK: NEW LIFT HEIGHT SENSOR RAISES THE BAR

From now on, STILL fits all its FM-X reach trucks with a new lift height measuring system which is one of the best technologies available on the market. The system is the basis for a number of smart auxiliary functions. For example, a soft mast transition of the three masts available for the FM-X is made possible by this technology. The transition is soft enough to lift a PET bottle standing upside down on the forks to a maximum height of 13 m without falling over.

CARREFOUR DEPLOYS STILL LITHIUM-ION FLEET

The Italian subsidiary of the world's third-largest retail company, Carrefour, deploys lithium-ion technology (Li-Ion) from STILL. As of lately, a fleet of 66 EXU low lift pallet trucks has been in use in the outlets of the famous super- and hypermarket retail chain. Especially the possibility to easily opportunity charge the trucks anywhere without particular preparation, nor the need for a dedicated charging station makes the Li-Ion technology an ideal solution for smaller food retail stores that depend on optimum use of the available space.



LARGEST CONTAINERSHIP WORLDWIDE

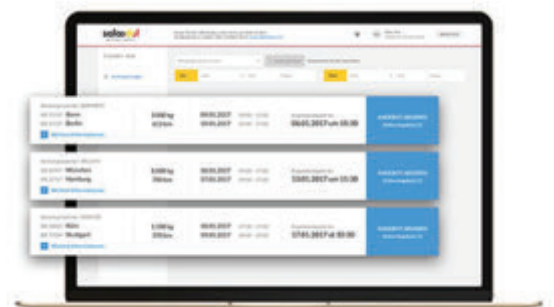
Recently, the world's largest container ship set sail to its maiden journey. The ultra-container vessel made by Samsung Heavy Industries for MOL is 400 metres long, 58.8 metres wide and holds 20,150 standard containers. It was christened "MS Triumph". Altogether, the ship owner MOL has ordered four ships of this dimension from Samsung Heavy Industries.

Photo: Samsung Heavy Industries

NEED FOR DIGITAL BUSINESS MODELS

A research conducted by BearingPoint and the IIHD institute indicates a growing importance for digital platform concepts in the logistics industry. Amongst others, customers expect ever quicker delivery of goods they have ordered online – putting new challenges to internal as well as external distribution logistics. The demand is high for innovative concepts that are fit for the future and that are courageous enough to walk down new paths. It is crucial to make best use of the potential inherent to cost reduction, fast delivery and automated processes.

Photo: DHL Germany



ALIBABA IS ON THE WAY TO EUROPE

The Amazon competitor from China, Alibaba, is pushing into the European market. The Alibaba Group plans to open a logistics centre in Bulgaria to supply customers all over Europe. Currently, talks with the Bulgarian government are underway with the Bulgarian Prime Minister strongly supporting a site in Bulgaria. Founded in 1999, the Alibaba Group currently employs a staff of over 46,000 and made a turnover of over \$15 billion in 2016 alone.

Photo: charnsitr/Shutterstock.com



NEXT STOP: BATCH SIZE 1

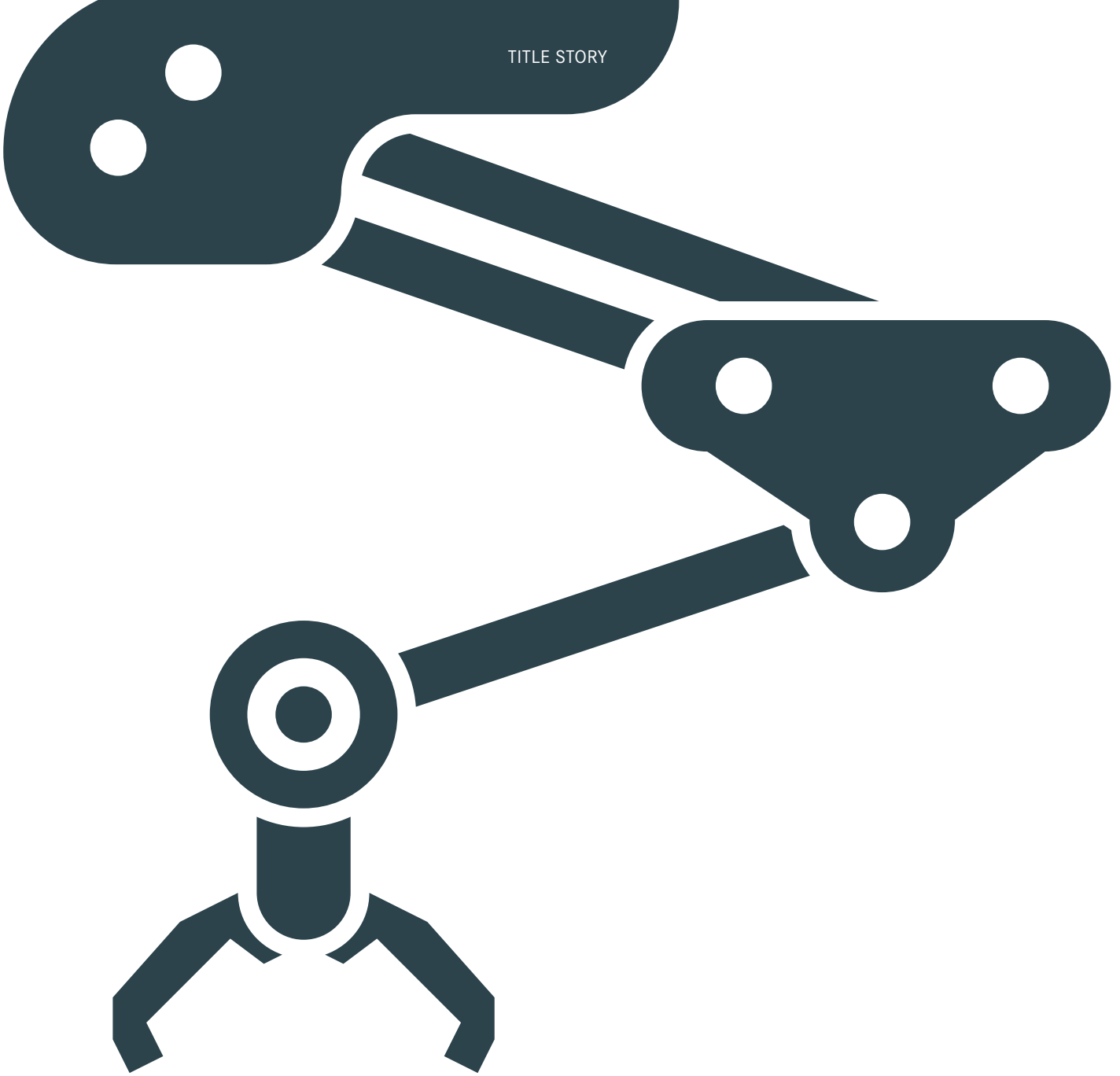
Industrial production of individual single products referred to as batch size 1 is one of the most ambitious goals of industry 4.0. According to the findings of the consultant company Staufen indicated by the "Deutsche Industrie 4.0 Index" [German industry 4.0 index], individual production is the main driver for the 277 German industrial companies that participated in the survey. 45 per cent of the companies answered that they are not yet sure whether they will be able to handle such a way of production. Pioneers in this sector are mechanical engineering companies that have a history in low unit numbers and a great extent of adaptation to individual customer requirements. Two thirds of the companies in this segment are already aiming for this new level of customization.

PRINTED GAS TURBINE BLADES

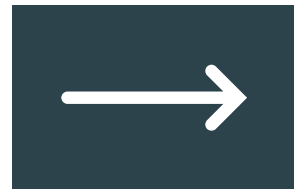
Siemens achieved a breakthrough in 3D printing: for the first time the technology group was able to operate blades completely made by Additive Manufacturing (AM) under full load in a gas turbine. In the turbine, the components are exposed to a temperature of 1,250 degree Celsius at speeds of 13,000 rounds per minute. This accelerates the blades to speeds exceeding 1,600 km/h at which they have to carry loads of up to 11 tons. This success was made possible mainly by the production of prototypes accelerated by AM. 3D print allows to develop and produce prototypes up to 90 per cent faster than with conventional methods.

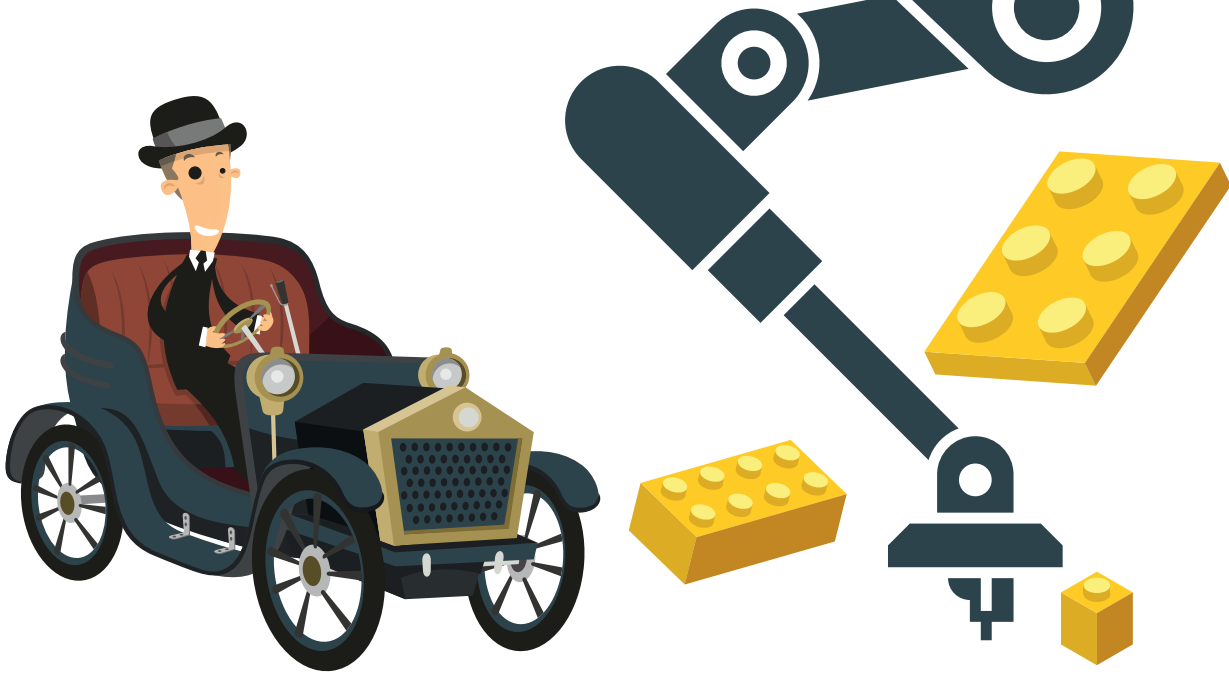
Photo: Siemens AG, Munich/Berlin





**Your
need,
your product**





Mass customization is to follow mass production:
Thanks to assembly line work, the price for the Ford T model dropped by more than half – making it affordable for new groups of customers.

Mass customization follows the principles of modularised production:
A smartly designed kit allows to create individual solutions.



CUSTOMISATION AS AN ECONOMIC FACTOR.

The range of customised products is growing. This includes consumer products as well as commercial products. Whether you want to have your personal muesli mix or a lift truck specialised to handle whisky barrels: Nearly anything is possible.

“I make the world as it pleases me”, is what Pippi Longstockings sings in the title song to the film of Astrid Lindgren’s famous novel. That was in the late nineteen sixties. But related to our consumer society, nothing would apply more. After all, personalisation has long since evolved to become one of the economic mega trends. Customised products are not only becoming more sought after, but they are also becoming available at affordable prices. How did this happen? Searching an answer to this question first leads to mass production.

EQUALITY FOR EVERYONE

At the end of the 19th century, the upcoming industrialisation promised “prosperity for the masses”. More and more products, in the past made by manual work, could now be produced by machines – in large numbers and at substantially lower prices. This meant that also the poor people could afford things that seemed unachievable before. One of the most prominent examples is the automobile. After having been an object of outspoken luxury for a long time, Henry Ford adapted it for the masses by perfecting assembly line production in the early 20th century. In 1909, Ford launched the famous T model, and in 1914 the production was completely adapted to assembly line production. The consequence: The sales price dropped by more than half: from \$850 to \$370. This way, Ford was able to access completely new groups of customers. With great success: By 1918 already, every second car in America was a Model T.

Customisation of costly objects produced in large numbers was unthinkable at the time. As the reported statement of Henry Ford says: Every customer can have the colour of their choice – as long as it is black.



In Mass customisation, customers transfer their individual demands and wishes to the products which adapt respectively.



In B2C markets the boom towards customisation is, amongst others, driven by the desire to be different from the mass.



INDIVIDUALITY IS MADE READY FOR SERIES

This has changed by now. The example of the automobile shows how natural the individualisation of a mass product has become to us in some areas of our lives today. On customer request, a new car can be individually configured down to the smallest detail – starting with the colour of the paint coat to the power of the engine, right down to the desired assistance and entertainment systems, and even the pattern of the semi-leather seats, or chrome-coloured skirt boards.

Again, the automotive industry took on the role of the pioneers. Mass production was turned into individualised customer-based mass production. Modular production systems allowed automobile makers to provide many more variants of their products without skyrocketing the production costs. Producers converted their production principle from “Make-to-stock” to “Make-to-order”. Instead of anonymously producing to stock, the individual configuration the customer asks for is produced after the order has been placed.

This trend to individualisation has long since reached low-price products in the B2C markets. Germany has become a renowned pioneer in this sector. Two of the best known examples from the federal republic are mymuesli and Spreadshirt. While the cerealists can create their own muesli mix at mymuesli (according to the maker there are 566 Trillion possible variations), the fashionable individualists can create their own clothing (and meanwhile also other articles, for example cups) with their most favourite design. And there are many more examples: Chocolate drops from M&M’s can be individualised online with only a few mouse clicks – just combine one of the 15 base colours with your own texts or uploaded images – and that’s it. You do not like M&M’s? Well then, how about creating your own

chocolate? There are several suppliers on the market for this, too. And if you want to get rid of the extra weight afterwards? Just go to the online pages of sports brands like Nike or Adidas and design your own pair of trainers.

MASS CUSTOMIZATION

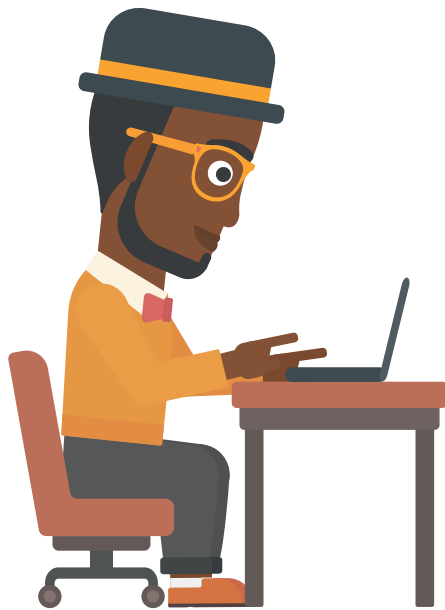
The technical term for this trend is mass customization. It refers to customer-individualised production of objects or services by means of mass production, merging cost advantages and differentiation advantages. This means: Products made in large numbers can be customised to the individual wishes of a prospect without significantly increasing the production costs. The adaptation of the product is made in two major steps: adjusting the aesthetic design and adjusting the technical functionality. In the case of a trainer, the aesthetic individualisation, for example, means to use a specific colour or texture as wished by the customer. If the producer also allows the customer to choose the stiffness of the sole or link up the shoe with a smartphone app to track the running, this would be an individualisation of the technical functionality.

Prof. Dr. Piller, professor for technology and innovation management at the Rheinisch-Westfälische Technische Hochschule (RWTH) is one of the most renowned experts in the field of mass customisation. He sees three major drivers for this economic trend. First: technical progress and digitalisation. “New technologies, such as 3D printing, allow ever more cost efficient production of customised products”, says Piller. Thanks to the internet revolution, these products are now available to everyone at a simple mouse click. Second: Young consumers are used to customized offers from other areas. Piller explains: “Just think of Facebook. In principle, this portal is a huge mass customisation site

which is fully automated and guaranteed different for every user. Or look at video on demand portals such as Netflix where consumers can arrange their own TV programme and automatically receive suggestions for shows based on their personal interests.” Third: saturated markets. By offering individualised products, companies in tough markets can differentiate from their competitors. “There are many great start-ups that have found their niche with mass customisation in markets that are actually saturated.” says Piller.

CUSTOMERS BECOME DESIGNERS

It is not only the products as such that create the success of mass customisation. The “product value”, i.e. the benefit of the product, is always complemented by the “experience value” – a sensational factor that arises from integrating the customer into the creation process of the product. Instead of simply consuming the product, the customer takes on the role of a co-designer, ideally actively contributing to the process. For the company, this bears the benefit of high customer loyalty. Emotionally, the customer is much more involved by making a contribution to the creation of the product. This is something that substantially increased the subjectively perceived value of the product. And the customer is ready to spend more money on this additional value, professor Piller underpins: “A well known study which has been replicated a number of times already shows quite consistently that customers are ready to pay an extra amount of 30 to 50 per cent more for customised products.



Mass customisation makes customers co-designers who adapt products to match their personal preferences. This is usually done with the help of online configurators.

OPTIMISED PRODUCT KITS

One of the most suitable tools to engage customers in the production of their customised product are online configurators. “However, even more important than providing the customer with such a tool to configure a product is to make this tool usable for the customer,” Piller knows to report. It is paramount not to overburden the customer in their role as a co-designer. “Reducing complexity and simplification are fundamental virtues of any good configurator.

It must be easy to understand and the process must be completed quickly.” This is why it is important to restrict the number of options available to the customer, “otherwise mass customisation quickly turns into ‘mass confusion’.” Instead of developing a completely new product, the customer has room to combine a given number of different pre-selected options to match their individual needs and desires.

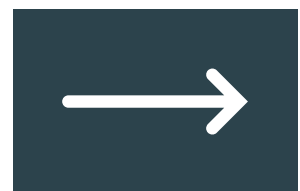
The technical jargon talks about ‘solution space’ in this respect. It is crucial to precisely identify those product attributes in which customer needs and preferences differ most significantly and based on that make a clearly defined offer. Piller puts it in a nutshell: “Mass customisation is about adjusting a product in accordance with individual needs and to configure it respectively – it is not about re-inventing the product. One of the most prominent tasks of mass customisation is to define the optimum product kit.”

MASS CUSTOMIZATION IN B2B MARKETS

Mass customization is deeply rooted in the B2B market. Major industrial companies have been making use of modular products for a long time in producing large and complex machines. A major success factor for Frank Piller: “Amongst other factors, European mechanical engineering does so well on the global market because it developed the capability to provide individual customer solutions at a very high level quite early on.” The level here is already high enough to make it crucial for industrial companies to further increase cost efficiency instead of becoming even more individualised. Opposed to B2C business, where aesthetic customisation often plays a leading role, the functional adaptation of the products is clearly in the foreground in B2B markets. Piller explains: “This is primarily about perfectly fitting a product into an existing value adding chain.”

UNIQUE PIECES

STILL is one of the pioneers in the field of customisation as well, having made use of modular product kits for many years in the past already. One of the major goals is to offer the customer solutions that are as individual as possible, optimally adapted to the customer requirements. Depending on the particular model, this adaptability



goes far beyond of what is common in the automotive industry. Even for a STILL counter balance truck, the number of possible configuration variants with the standard equipment options alone amount to a six-digit figure. And also beyond such mass customisation, individuality plays an important role for STILL.

All the solutions that cannot be build by combining existing modules and equipment options are called Customer Options (CO). Jan Bergemann, head of the STILL Order Centre, explains: “We want to satisfy the customer. And if the requirements are so specific that we cannot cover them with our regular equipment options, we provide an individual design.”

The appreciation of such individual designs is growing and Bergemann knows why: “Our customers require us to provide ever more individual solutions because they themselves design their own processes ever more individually. They expect us to deliver the tools that fit to implement their ideas.” That could be a special location for a controller or a completely modified forklift truck with an extra high mast and a platform that lifts the driver to roll whiskey barrels into a rack.

KNOWLEDGE IS POWER

Opposed to traditional mass customisation, customer options are initially unique pieces. Only after the demand rises to a significant level, the CO is integrated into the standardised module kit. However, due to the high degree of specialisation this does not happen very often. But it still pays off to maintain the knowledge about a solution once delivered. If a specific requirement occurs again, the solution needs not be completely re-engineered. This leads to a benefit in time and costs which can be directly forwarded to the customer. For this

means, STILL has been operating a special CO tool for four years. “Assume a customer asks for a mast to lift loads particularly high and the sales person does not find a suitable solution in the regular sales configurator. In that case, he will refer to the CO tool and check whether STILL has ever built such a mast for a different customer. If yes, he will find it there and can even order it directly”, explains Bergemann. Any solution is retrievable by all the sales teams and can be used.

COMPETENT IMPLEMENTATION

It is not always economically feasible to realise individual customer solutions and designs in the standard factory, as this may cause disruptions of the remaining production. This is where the STILL Customer Option Unit Sales moves into the field. Together with an external engineering company, the employees of this unit take care to design and build individual customer options that cannot be made by the factory itself. After being completed, these solutions are also stored in the database of the CO tool. “This tool is a nice example of how technical progress helps us to better fulfil our customers’ wishes. Only ten years ago, such a tool would have been unthinkable,” says Bergemann.

After all, as many as five to ten percent of all the trucks sold by STILL carry substantial technical modifications. Adding apparently simple Customer Options such as individually positioned lamps or special attachments, the respective share of trucks produced in Hamburg rises to nearly 50 per cent.

This means that individuality is a crucial economic factor – in B2C as well as in B2B markets. Whilst more and more every-day consumer goods can be customised to a certain extent to match our wishes, ideas and demands without high price increases, the technical adaptation of product functionalities have already become normality in B2B markets – at least in the premium section. Here it is now of greatest importance to increase cost efficiency and find smart solutions for individual customisations that are not produced in large numbers, but for individual special cases.



Social networks can be viewed as massive mass customisation machines. They function virtually fully automated and offer an individual experience to every user.





“IT IS IMPORTANT TO UNDERSTAND WHERE THE CUSTOMER NEEDS INDIVIDUALITY”

Frank Piller, professor for management and head of the department of innovation management at the university RWTH Aachen is one of the most renowned experts for mass customization. We talked with him about the particularities of individual mass products.

PROFESSOR PILLER, IN BRIEF: WHAT IS MASS CUSTOMISATION?

Mass customisation refers to products made in mass that can be individualised without significant increases in production costs. Traditionally, this is achieved by modularisation. As a customer, I build my individual product from a modular kit and the producer preserves a major part of the cost benefits resulting from mass production of standardised components. At the same time the producer reduces complexity for the customer by implementing a smart process architecture for the customer.

YOU MEAN TO MAKE LIFE EASIER FOR THE CUSTOMER?

Exactly. Mass customizers make the customer a co-designer who actively contributes to the production of the desired product. Often this is done by online configurators. Reduction of complexity and simplification are the fundamental virtues of a good configurator. It must be easy to understand and the process must be completed quickly. If there are too many options, the mass customisation will soon create mass confusion.

WHAT NEEDS TO BE CONSIDERED IN SELECTING THE AVAILABLE OPTIONS?

It is important to understand where the customer needs individuality. I have seen many mass customizers fail because individuality was offered in a form that the customer did not want. Companies have to find out where their customers want to differentiate, and how and where they are willing to pay more for customisation.

THAT MEANS CUSTOMISED PRODUCTS ALLOW TO EARN MORE MONEY?

There is a number of research studies available that have consistently shown that customers are ready to pay up to 50 per cent more for the configuration experience.

INTERESTING. THAT MEANS THE VALUE OF A CUSTOMISED PRODUCT EXTENDS BEYOND THE PRODUCT ITSELF?

Yes, the so called ‘experience value’ is of particular importance for companies just entering the market. But it is effective only once, perhaps twice. After that, it is more and more perceived by the customer as additional work. The product benefit, however, is more sustainable.

HOW CAN THIS PRODUCT BENEFIT BE INCREASED?

There are two major approaches to customisation: the aesthetic design, fit and product functionality.

AND THE MOST IMPORTANT APPROACH...

Depends on the product. In the fashion industry, aesthetic design obviously plays a relatively important role. Just as the fit, which often merges with functionality. A perfect fit of a pair of jeans also has a certain additional value. Customisation is most sustainable in product functionality.

CAN YOU GIVE US AN EXAMPLE?

Take the company mymuesli. There you can mix your individual muesli. The function is clearly in the foreground. Beyond the mere taste, there are also mueslis that are particularly for people with allergies, pregnant women, or athletes.

WHAT ABOUT MASS CUSTOMISATION IN B2B MARKETS?

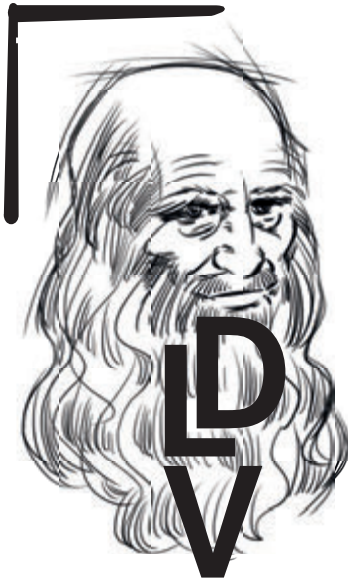
Mass customization is deeply rooted in the B2B market. European mechanical engineering is as strong as it is on the global market because it developed the capacity to offer individual customer solutions at a very high level at a very early stage. Instead of becoming more individual still, the focus here is mainly on increasing cost efficiency.

DO THE THREE APPROACHES YOU MENTIONED FOR CUSTOMISATION ALSO APPLY TO B2B MARKETS?

The B2B markets are virtually exclusively about functional adaptations. It is all about optimally integrating the product or the machine into an existing value adding chain to improve it.

Da Vinci Code 4.0

MEASURING INDIVIDUALITY – Comparable to a thriller by Dan Brown, with hundreds of years of time lag: Craig Venter is the ‘bad guy’ of DNA decoding.



15.04.1452
02.05.1519
LEONARDO DA VINCI

A wet and cold April evening in Florence in the year 1506. In the Ospedale Santa Maria Nuova, he sat on the bedside of a dying old man. “This old man told me only a few hours before his death that he was over hundred years old and felt no sickness at all apart from weakness.” The man who took that note is an artist, but in his mind he is a scientist. His name: Leonardo di ser Piero. His special interest is in the innermost of human beings. The old man allowed him to open his body after his death. Just as accurate as he handles his paint brush, he handles his tools here: the fine-toothed bone saw and the scalpel. The man whom today we know by the name of Leonardo da Vinci and as the creator of the famous ‘Mona Lisa’, finds that the blood vessels are smooth and wide in youth but turn narrow and wrinkled at age. The result of his examination is the first known description of arteriosclerosis. And he notes all this down in mirror writing. But the ultimate basis for individuality will be discovered by someone else – on a continent that had only been discovered 14 years before and in a different century.

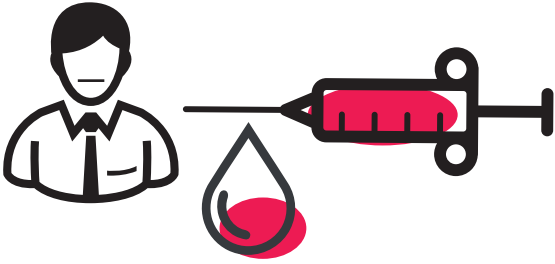
June 26, 2000 is a scorching day in Washington D.C. The man who aims to unveil the secrets of individuality in the style of Leonardo has reached his dreams. He has just decoded the human genome and with it the core of human individuality. In The White House, President Bill Clinton insisted on the honour to declare him the new star of genetic research just in the advent of the fiftieth anniversary of the discovery of the double helix by Crick and Watson: “We are celebrating the completion of the first survey of the complete human genome. This is without doubt the most important and most fascinating map ever drawn by mankind”, Clinton said. But instead of keeping his notes in booklets as Leonardo did, Venter calls on the ‘digital age of biology’, because in the artificial reconstruction of the

huge genomes the focus is on IT. The photographer of Time Magazine bans the moment for the title page: Craig Venter and beside him his rival Francis Collins. With his private research company Celera Genomics, Venter run a merciless race against the publicly funded Human Genome Project of Francis Collins. In this legendary race, Venter is the winner and the ‘bad guy’, because instead of making the gene sequences publicly available for free use, he registers them for patent in order to market them. Intellectual property of something that every human calls their own? When the President left the foyer of the East Room in The White House together with Venter and Francis, a band plays “Hail to the Chief”. A fine match, as after all, Venter's biography is quite iridescent and in some ways a prototype of the American Dream: As a disruptive youth he goes to Vietnam where he turns towards science and develops to become an ambitious researcher later on.

After ten years of research in his laboratory, Craig Venter has recently created an organism consisting only of those genes that are absolutely indispensable for survival. The bacteria created that way resembles a natural being in many aspects. For many geneticists, this is something like the holy grail: the minimal cell. This leaves one question: may or even should researchers not only discover their object of research but even create it, manipulate it? Leonardo would surely have answered “Yes” – in mirror handwriting.



14.10.1946
CRAIG VENTER



Not a standard pill

**KNOWING ONE MEANS KNOWING
NONE – SICKNESS IS AS DIVERSE
AS THE PEOPLE THEY INFEST**

After all, every human being carries their own genome – and with it the key to their personal medicine.

Be it the expensive original drug or the price efficient generic product: today, medical drugs are ‘standard’ products – developed and prescribed along the guidelines of Joe Bloggs. Even to decide on the dose, doctors and pharmacists mostly follow the standardised instructions on the package leaflet. All that despite the clarification Hippocrates, pioneer of the holistic approach to medicine, made more than 2,000 years ago: “It is more important to know who has an illness than to know which illness a person has.”

The decodification of the human genome and the effects the environment has on it open new opportunities to customised therapy. In the future it will allow to adapt the active substances to the individual profile of each person without side effects. Precondition for this is the completed sequencing of the genome in which all variants of the genes are determined together. Costs for sequencing have meanwhile dropped so far that they hardly differ from other medical applications. In at least 600 different illnesses genome analysis can be of help and this possibility is largely made use of. The boom of the still young discipline of pharmacogenetics that investigates the interplay of genetic material with drugs speaks for itself.

However, even if online gene tests are virtually everyday use in the USA, the situation in Europe is quite different. Following the German Gendiagnostikgesetz, the Act of Gene Diagnostics, a test is only permitted after a patient has explicitly agreed to the test after a formal consultation with a doctor. So everyone has the right to know and not to know. But for most people affected the chances – and curiosity – prevail. For example in case of depression. The traditional diagnostics is still very simplistic. In the future, medics will look closely at the individual genome, because by now one thing has become clear: People with certain gene variants are more likely to develop depression than others. This is why the future lies in the consideration of biological indicators, so called bio-markers. Once it is possible to map gen tests with certain bio-markers, chances will rise to customise diagnostics as well as treatment of depression without side effects. Molecules of the affected substances will be discovered for each contingent of patients, licenced to pharmaceutical companies that will produce individual drugs. And for the healthy it will be possible to develop genome-specific prevention schemes guided by individual risk factors. Therefore, it is not unlikely that in the future each one of us will know their own genome sequence – just as we all know our own blood group.





Full speed ahead for additive production: About 200 components in modern ICE trains are produced by 3D print, for example, the coat hooks or terminal boxes.

Photo: Siemens AG, Munich/Berlin

Just print

ADVANCING 3D PRINT – At home, 3D print is becoming the driver of the mega trend towards customisation. The technology enhances autonomy of the individual and opens new market access points.

The DIY-customer

DIY – three letters that represent a whole trend which is about to trigger a change of paradigm in industrial production. “Do it yourself”. The background to the trend to individualisation is accompanied on the economic level with an increasing differentiation of the markets. At the end of the development there will be a personalised product for the target group size ‘one’. Precondition for this would be individual production facilities beyond the factory – in living rooms or garages. Decentralised production which is made possible by 3D printing shows the traits of a social shift in paradigm. Or, according to Karl Marx: The means of production are taken off the hands of the few producers and are given back to the masses. Technologies such as 3D printing inspire philosophers like Joseph Pine to make illustrative statements like: “The customer will not buy the product, but the production process.”

3D printing: A fuzzy term

What is behind this miraculous technology? 3D printing – also referred to additive production – is precisely speaking a laser welding process in which layers of material are ‘welded’ onto each other. Layering in this context means to precisely add a layer of metal onto the previous layer. Any type of metal alloys used for high production and material qualities can be used: Titan and aluminium alloys, tool as well as stainless steels, chrome-nickel steels and cobalt-chrome alloys besides polyamides. Ecologically and economically, 3D printing scores a positive balance to produce components: Waste of material and energy is minimized as, for example, no chippings are produced as would be the case if material is drilled or grinded. Neither will there be emissions

from oils and cooling agents. Even the residual heat can be made use of. "Spare parts on demand" is one of the lead topics in this context and a model to reduce warehousing costs and delivery time. This vision has already materialised on Europe's railways. A coat hook in the ICE train or a terminal block beneath the motor of the railway engine: Bit by bit, the trains of the Deutsche Bahn are built from components originating from individual production by 3D print. At the moment there are about 200 self-made components installed in the ICE trains. 3D print is mainly deployed as a method to produce spare parts with long delivery times. For a long time these methods were predominantly used to make highly detailed prototypes in design development. Now 3D printing is also moving into the field of rapid manufacturing, i.e. fast production of parts that are needed right here and now. The consequences for traditional production industry are at hand: in the medium run, additive production methods will change complete value adding chains. Against this background, the pressure rises in particular in the supplying industries. Only those companies willing to sell the software and data that enable customers to produce the spare parts directly on their own will be able to keep their customers in the age of 3D printing.



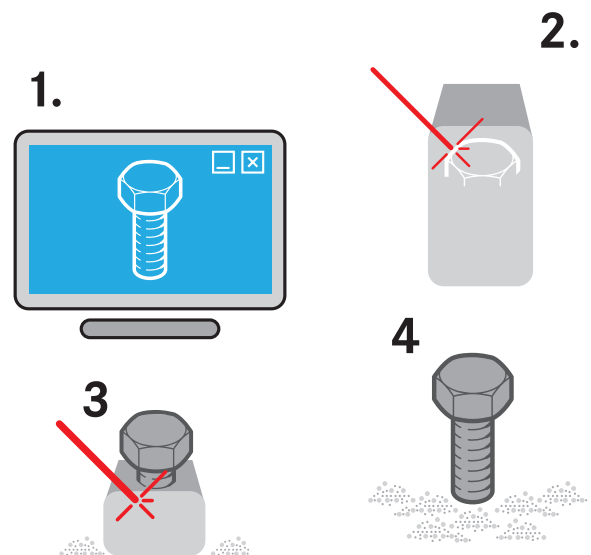
Instead of spare parts, suppliers may soon be selling software and data with which customers can print their own spare parts. Image: General Electric/GE Additive

Many aspects to the cost-benefit balance of 3D

Additive production with laser printers is still expensive. The required type of printer may vary depending on the intended use and the purchase price for the devices fit for industrial applications easily reach five- to six-digit sums. Experts forecast that the direct costs for printing could drop by about a third over the coming years. That would mean 3D printers would turn standard in industrial production. Until now, such print jobs are outsourced to external experts – also by the Deutsche Bahn. Particularly interesting are individual spare parts that are impossible to make with conventional production methods. For example 'human spares' from 3D printers. The company EIT founded in 2014 with its home base in Wurmlingen, Baden-Wuerttemberg produces individual implants for the human vertebral column with additive methods. The benefit: Compared to conventional fabrication with CNC lathes, cellular tissue structures can be produced from bio-friendly titan and perfectly adapted to the individual anatomy. The printed structure is extremely strong and human cells can grow into it – without rejection reactions. Printing a 3D vertebrae takes a day.

Return of the production from low-wage countries

3D printing makes the development process of mechanical parts more and more alike to the development of software. In the age of industry 4.0 and the close linkage of information chains, additive methods signal the ending of conventional production and logistics chains. And more: For the industrial states, 3D printing offers perfect opportunities to regain many production processes that have been outsourced to low-wage countries in the past back to Europe or the USA. The 'extended workbench of the world', as China is often called due to its mass production for many international markets, would become the 3D workbench at home. Or: demand and supply will come more closely together in terms of time as well as in terms of space – even as close as into our own four walls and with this into the hands of every individual.



The additive production method: In 3D printing, pulverised metal alloys are melted by a laser adding layers to the workpiece by the micrometre

The new dimension of order picking

EK-X 10 – cabin width, truck width, height of the overhead guard, with lifting cabin or without – the EK-X 10 is just as flexible in terms of configuration as its big brother and offers real EK-Xcellency in the basic class.



PRECISION:

Accurate and effortless

Lifting loads fast is good. Being able to rely on sensitive controls and smooth movements is even better. All the movements of the EK-X 10 are swift, effortless and perfectly controllable at all times. This makes control easy for you.



POWER:

Aisle runner

Smooth and powerful are the characteristics of the maintenance free 24 Volt rotary current motor. A driving speed of up to 10 km/h and a lift speed of up to 0.4 m/s guarantee rapid storage processes for heights up to 6.35 metres.



ENVIRONMENT:

Extra efficiency

The energy recuperation which is standard for braking and lowering is only one aspect of the unmatched efficiency of the EK-X 10. Another aspect is the Blue-Q efficiency mode: On pressing a button, the energy consumption of the truck will drop by up to 10 per cent – without any significant impact on the performance.





ERGONOMICS: Safe & comfortable

Intuitive and individual is the motto of the ergonomic concept. Not only the optional tilting side barrier makes it easier to reach into the rack – the numerous equipment options for the cabin such as terminals, supports and storage compartments do as well, and they are easily within the reach of any driver of any size.



SAFETY: Light up the dark

Safe, enduring and efficient: The optional SafetyLight calls the attention of other traffic to the approaching truck. The additional LED spot lights offer optimum visibility also in the darkest corners of the warehouse.



COMPACTNESS: Fits all sizes

No two warehouses are identical. The modular design of the EK-X 10 accounts precisely for this circumstance. It can be flexibly configured and adapted to virtually any aisle width and reach height. And its credo always is: as compact as possible. As a result, you are able to make optimal use of your storage space.



EK-X: for the Champions League!

You want to lift even heavier loads even higher with more power? Then take a look at the 'big' 48-Volt version of the EK-X. It does not only move up to 1.2 tons of load to a reach height of outstanding 12 metres, but with driving speeds of up to 13 km/h it is also faster. Thanks to the automatic, steering angle controlled speed reduction, you will move swiftly and smoothly through your aisles.





Eight MX-X VNA trucks are the logistic heart piece of the distribution centre of Derby Cycle to order pick thousands of bicycles efficiently and safely.



Individual solution for 150,000 bicycles

INDIVIDUAL SOLUTION – Germany's cycle maker with the largest turnover, Derby Cycle, benefits from a central distribution centre.

It is operated by the logistics service provider Hellmann Worldwide Logistics and the material flow concept from STILL was implemented. Highlight: Wire-guided MX-X order picker trucks with a special design carry mobile working platforms.



CHALLENGE

Customised material flow concept for a centralised distribution centre for 150,000 bicycles.

SOLUTION

A combination of VNA trucks with special design, wire guided navigation and efficient electric lift trucks as well as a smart software system to optimise fleets.

PRODUCTS

Eight specialised MX-X order pickers modified to carry mobile work platforms, ten RX 20 electric counter balance trucks, FleetManager 4.x fleet management software.

Although STILL did not re-invent the wheel, they have found a solution that made the handling processes for thousands of bikes outstandingly efficient. But from the beginning: Derby Cycle is Germany's cycle maker with the largest turnover and also holds a leading position on the European market as a whole. The healthy growth called for additional optimisations in warehouse logistics. STILL was able to convince with a concept that best answered the given challenges.

CENTRAL DISTRIBUTION

The logistics service provider Hellmann Worldwide Logistics is responsible for the complete supply chain of Derby Cycle. This includes overseas freight, shuttle traffic that link up production and warehouse sites, outbound groupage transports to all over Europe and all kinds of warehousing activities. To become fit for the future, Hellmann replaced several distributed warehouses with a new centralised distribution warehouse located in Emstek in Lower Saxony and joined up with STILL as a strong partner to support the implementation. "Thanks to the customised logistics concept, we are now able to attend over 5,000 cycle retailers in over 600 countries from one central location", Andreas Brothe, Branch Manager at Hellmanns, tells us.

CUSTOMISED MX-X VNA ORDER PICKER

The high bay rack is the heart piece of the distribution centre. 24 aisles with 48 load faces offer storage space for up to 150,000 bicycles. The high warehouse capacity was made possible by the wire guided STILL MX-X order pickers. Thanks to this type of navigation, guide rails on the floor are not necessary so that it is also possible to use the floor level of the racks as storage space. And this is not the only speciality.

The MX-X stackers have been individually customised for the customer to be able to carry mobile work platforms, so-called stake racks. The operators move up together with these platforms to heights of over ten metres and load the cycles which are packed in boxes from the storage rack onto the mobile platform. The platforms are fitted with an interac-



Thanks to the wire-guided navigation without rails, it is possible to use all the rack levels in the warehouse from the bottom right to the top at a height of over ten metres.



The stake racks can be easily moved manually onto the forks where they automatically lock in position.

tive locking mechanism that must be activated to release the trucks to enter the aisles. Secured by a rope system, the operator steps onto the platform and picks the needed bicycles to order.

ASSISTANCE FOR EFFICIENCY AND SAFETY

An additional push in productivity is achieved by the STILL Optispeed 4.0 assistance system. This system does not only optimise the performance of the truck movements but also offers a semi-automated approach to the target position in the rack face. All relevant coordinates are stored in the warehouse management system. “This way, we can differentiate between picking up and destacking of a load at the target position and automatically set the fork to the height needed for

the task at hand,” explains Lars Lemke, responsible project manager for the navigation system for STILL. Work is made even easier for the operator by the lighting of the truck which automatically highlights the destination storage bay, visually pointing it out to the operator. “This prevents mistakes and corresponding time consuming and expensive searching”, Lemke explains.

The order picked cycles are loaded by a fleet of ten RX 20 electric counter balanced trucks. Fork shoes at 90° angles beneath the platforms allow the RX 20 counter balance trucks to move the stake racks after they have been filled by the MX-X trucks.

SOFTWARE TO RELEASE THE FULL POTENTIAL OF THE FLEET

Efficient warehouse processes are an essential factor to success for logistics service providers such as Hellmann Worldwide Logistics. This also means making full use of the potential of the fleet of trucks in the warehouse. To do this, the company selected the STILL FleetManager 4.x. This web based software records all relevant truck information, for example job allocation times and return of the truck. This records the overall biography of the complete fleet and the data is available for demand analysis with comprehensible reporting schemes. The transparent overview of truck availability and utilisation times leads to an even distribution of the workload across the whole fleet, maximised operation times and eventually to reduced fleet sizes.

The perfectly harmonised interaction of all the named components in the customised warehouse concept for Derby Cycle increases productivity, flexibility and safety while saving time, space and costs. Andreas Bothe, branch manager at Hellmanns, comes to a positive conclusion concerning the cooperation with STILL: “Essential for the success of this pilot project were the experience, consultation and the extensive service provided by STILL.”



The special design of the VNA trucks allows the use of mobile work platforms, so-called stake racks which are used to order pick bicycles.

Pay-per-use

PAY PER USE – It is not a brand new idea to pay for actual use only. In software, this has already become an established business mode. But could this be applicable for producing industries and intralogistics?



In car sharing models, users only pay the actual utilisation of the car; purchase costs and fixed costs do not apply. Photo: car2go

Do I need a drilling machine or a hole in the wall? Sometimes changing perspective can open up quite new sights of things. Just ask: How often do I need a drilling machine and what is my benefit of having it at home and not using it? If you drill holes every day, you will be inclined to purchase a drilling machine, or maybe rent or lease one. But if you only need a hole once a year, you might want to think differently. Why not, for example only pay for usage, i.e. for the hole in the wall? But would that work? Or would it be possible to design a payment model that is just as attractive for frequent users?

NO NEED, NO COSTS

Be it B2B or B2C – in times of digitisation and industry 4.0 the point is to think new business models. Or to re-discover and develop existing ones, after all use-based payment schemes are not a new idea and have long been established in many industries. For example, aircraft engine makers do not invoice a complete engine to an airline but only bill the operating hours. The engine maker Rolls-Royce made this pay-per-use model known as 'Power by the hour' in the 1980ies and since, it has become popular in many industries including software, among others in the logistics industry as well. A major benefit: Costs only occur if there is an actual need. The idea of variable costs replacing fixed costs has by now also spread to business with private consumers. It corresponds with the zeitgeist not to pile up property and belongings but to pay for the availability and the temporal use of a product instead. A good example for this

is car sharing. From the user's perspective, this offers many benefits: They only pay for the actual and flexible utilisation of the car avoiding high purchase and fixed costs. At the same time, costs become more transparent. And the user does not need to worry about maintenance and care for the car. Users can carefree rely on the perfect function of the car. Therefore, as long as there are enough cars nearby at attractive prices, there are no apparent drawbacks from the perspective of the user.

PAY-PER-USE IN B2B MARKETS

The aircraft engines mentioned above are not the only example where pay-per-use makes sense in B2B markets. Logistics also offers large potential for this kind of payment scheme. One crucial precondition for this is already given with digital networking in many areas. If smart products communicate with each other, companies can generate big data, opening quite new perspectives of product utilisation by the users. STILL customers, for example, can visualise and evaluate all relevant data of their truck fleets across national boundaries with the new online portal neXXt fleet which transmits truck data by GPRS modules.

Initially, the portal comprises nine web applications that customers can individually combine according to their need with monthly, quarterly or annual payment schemes. Therefore, they only pay for the functions they actually use.

Based on the digitally collected data it is, for example, possible to optimally plan maintenance works and show service reports at any time. It is also possible to prepare detailed analysis of truck utilisation allowing to substantially optimise the fleet. Another benefit is the real time recording of operation hours of the trucks. This, for example, allows adjusting service contracts or rental solutions precisely to the actual utilisation of the truck.

INTERESTING PERSPECTIVES

A real time recording of fleet data opens up opportunities for more interesting pay-per-use business models: It would, for example, be an idea to provide customers with the more and more sought after lithium ion batteries or even complete lithium ion systems consisting of charger, battery and truck free of charge and only invoice the actual utilisation times. It would also be possible to design hour-based invoicing models with volume restrictions we already know from mobile internet access.

A comparable payment scheme would even be possible for all the warehouse and transport processes. After all, the customer will only pay for the handling of the goods – not for the warehouse equipment; just as the private home owner would pay for the hole in the wall and not for the drilling machine. Contracts could not only cover vehicle utilisation but complete transport orders. This would allow

completely outsourcing the whole of the internal transport such as goods reception, outsourcing of production facilities as well as intermediate transportation during the production process.

Payment would then cover the result in form of a forwarding price. However, the future will show whether customers will turn from paying for forklift trucks to paying for its use or even the flow of materials as such. One thing is for sure: even today STILL provides the smart interaction of forklift trucks, warehouse equipment, software, and service. An interaction that opens thrilling opportunities for new payment schemes and business models.



“Power by the hour”: Customers of the engine maker Rolls-Royce do not pay for the engine, they pay for the use. Image: Rolls-Royce plc

Just relax.

TIPS FOR INNER PEACE – Hectic working day? Loads of private responsibilities? Our everyday life stresses us everywhere.

Take a break from responsibility and performance:
These five tips for relaxation guarantee inner peace.

01: ENJOY THE FREEDOM OF THE MOMENT

Live and enjoy the freedom of the moment. Instead of starting the day in the morning by thinking of all the open tasks of the day before, just concentrate on the moment. Feel the warm water in the shower run over your skin. Breathe in the fresh morning air on your way to the car or the train station and note how nature blossoms up for the day. Try to soak up the freedom of these moments consciously and without distractions. You will be surprised about how much your mind will relax if you do.

02: WORK OUT AND RELAX

This is how to quickly calm body and mind after a long day at the office: On arriving home, do as many push ups or jumping jacks as you can. Catch your breath for a moment and do it again. Then lay comfortably on your back. Watch your muscles relax and your thoughts calm down. This is the perfect start in a relaxing evening.

03: THE SLOW TORTOISE

In our professional and private lives speed is everything. It is not! Take a time break once a day – and pretend you are a tortoise. Although this may initially sound strange, it is a very effective way to calm down inside. Go to a quiet place and do all the movements in slow motion. Try to slow your thoughts down to slow motion as well. The longer you do this, the more your relationship with your environment will change and you will move to an inner state of calmness.

04: BREATHE THE ENERGY OF LIFE

Breathing plays an essential role for inner peace and quiet. This is why yoga breathing is called Pranayama. Prana means 'energy of life', yama means 'control'. Breathing therefore controls our energy of life. A simple yoga breathing exercise to release stress is alternating breathing: Sit upright and close your eyes. Close your right nostril with your right thumb and breathe in through your nose for four seconds. Now close the other nostril with your ring finger and hold your breath for four seconds. Then open your right nostril and exhale for eight seconds. Now repeat the procedure with your other nostril. It is recommended to do three to eight cycles.

05: PROGRESSIVE MUSCLE RELAXATION

Tense – hold – release – feel. That is the motto of the progressive muscle relaxation method initially developed by the US doctor Edmond Jacobsen. It is as simple as it is effective: Close your eyes and tense up single muscle groups as tightly as you can for seven to ten seconds. Release the tension and consciously observe the feeling of the relaxing muscles for 20 to 30 seconds. For example, clench a fist, squeeze your eyes closed or pull up your shoulders. To finish, stretch all your extremities. After this exercise you will feel much more relaxed than before.





A day in Barcelona

WITH FRANK KRUMBIEGEL

For someone from Westphalia there are, besides good weather, only two reasons to start your professional career in Spain: Love and STILL.



My wife is Spanish and as far as STILL is concerned I have had positions in sales and in rental business since 1999. By now I am at home in the used truck business. Privately I am a sailor and if wind speeds pass four, I am right in my home element. And if there is less wind, I run, swim and cycle for sportive dynamics.

The centre of the Spanish metropolis at the Mediterranean Sea is easy to discover on foot. I will tell you the must-sees. So vamos! First stop: The monumental Plaza de España. From the visitors platform of the former bull fighting arena you will be able to enjoy the great view of the promenade. It passes through the old buildings of the trade fair to the fountains (Fuente Mágica) and to the Palau Nacional.

The next leg goes up the Montjuic where we pass the Olympic stadium half way up. Quite close to that is the station of the cableway which we can take to soar down directly to the harbour. From here we can overlook the whole of Barcelona. The steeples of the gothic cathedral, the church Santa Maria del Pi, and of course the Sagrada Familia, the still unfinished cathedral of the master builder Gaudi shape the picture of the city. If you want to visit the Sagrada Familia, make sure to book your ticket online in advance.

The cableway takes us right to the beautiful Barceloneta neighbourhood where we can take a walk in the sun along the port promenade along the yachts and the restaurants up to the 20-metre high Columbus Column. By the way, it points towards America. From here our route takes us for about one kilometre along the promenade

La Rambla to the Plaza de Catalunya passing the opera house Liceu and the Plaza Real. After about 100 metres we turn into the market La Boquería. This is a place no one should miss, and try the different snacks.

After this culinary refresher we move on to the gothic quarters. It is directly across of the La Ramblas. Historic alleys paved with cobblestones make our walk a time journey to the Middle Ages. Our first stop is the church of Santa Maria del Pi where artists offer their work on the adjacent market place. From there we pass narrow alleyways to the gothic cathedral. Directly in front of it we can enter the shopping high street which takes us to the Plaza de Catalunya and on to the Paseo de Gracia where Gaudis buildings La Pedrera and Casa Battlo are worth a visit.

If you have not yet enjoyed a Paella, it is a good idea to close the tour in one of the typical tapas bars at the Ramblas de Cataluña parallel to the Paseo de Gracia – for example the Ciudad Condal.

And the evening is up for the bars in the Barrio 'El Borne', the restaurants in the 'Puerto olímpico', or the cocktail bars at Barceloneta beach. ¡Pásalo bien!

Only for me

INDIVIDUALISED PRODUCTS FOR 'GENERATION ME' – more and more industries make customisation a brand image and take a competitive edge. The variety of customisable products has never been larger. We have picked five examples we particularly liked.



Photo: Nike, Inc.

NIKEiD

Customised dynamic entrance: Materials, colour, embroidery or innovation – the Nike configurator does not only create a unique pair of shoes. It also bundles all the knowledge of the individual customer to forecast future preferences and trends.

WWW.NIKEID.COM

OPEL ADAM

Batch size 1 on wheels: The configurator offers twelve body colours, three roof colours, five colours for the radiator cover, over forty wheel variants and nearly twenty different interior designs. Plus design versions for doors, roof lining and many carpets. Even the car key matches the selected colour of the body.

WWW.OPEL-ADAM.COM



Photo: Adam Opel AG



Photo: mymuesli/Viktor Strasse

mymuesli

Breakfast à la carte: Health-conscious and fashionable breakfast eaters will not only combine their favourite ingredients with the online muesli mixer but also design the packaging it comes in. To those who cannot make up their mind, topic areas such as 'fitness' will provide smart anchoring points for a vital design. Only the milk is not yet customised.

WWW.MYMUESLI.COM



Nicetrails

Build your walk: Using a cloud-based GPS application, Nicetrails builds 3D models of individual walking routes or terrains. This makes the next mountain climbing or cycle tour a haptic experience in advance – or a lasting memory for the collection of trophies. Also landscape architects or passionate golfers will be pleased to take their favourite green home.

WWW.NICETRAILS.COM



Photo: nicetrails.com



Motorola Mobility LLC.

Moto Mods™ by Lenovo

Smartphone configuration by user profile: Hasselblad camera and mini-projector for professional photographers or JBL loud speakers for DJs – the modular Moto Z Play system concentrates on those tools that really count for the individual customer.

WWW.MOTOMODS.COM



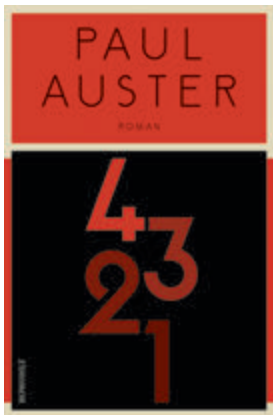
READING



DEIN EGO IST DEIN FEIND (EGO IS THE ENEMY)

Are our successes and failures caused by our environment? No, says marketing legend and bestseller author Ryan Holiday. Our ego is our enemy. It makes us blind for mistakes and hinders our development. With a rich bouquet of examples from literature, philosophy and history, Ryan Holiday impressively shows how overcoming our ego will help us to success. The book offers plausible findings that will help anyone to successfully face their biggest enemy: their own ego.

Holiday, Ryan (12 June 2017): Dein Ego ist dein Feind (Ego is the Enemy). FinanzBuch Verlag. Hardback. € 19.99

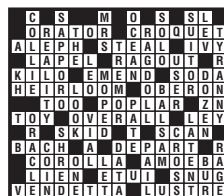


4 3 2 1

Life is what we make of it. In his book '4 3 2 1', bestselling author Paul Auster takes a skilled look at the coincidences in our lives. He tells us four versions of the life of Archibald Ferguson who grows up in Newark, America of the fifties: provincial and modest, fierce but unlucky, concerned and obsessed with contemporary events, a genius artist reaching for the stars. All variants of Archibald's life are coined by adventure, love and blows of life. '4 3 2 1' is a fascinating experiment and a peak of Auster's creative work.

Auster, Paul (2017): 4 3 2 1. Rowohlt Verlag. Hardback. € 29.95

Solution conneXXt #02



Solution: ENERGY HARVESTING

IMPRINT

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APPS

SNAPSEED

Snapseed is a free professional photo editor developed by Google. The app provides 29 tools and filters for you to make the best of your photos. The automatic or manual fine tuning of the exposure is only the peak of the iceberg. You can also edit the perspective of your photos, cut crooked lines, add text and light effects or remove unwanted people from group photos.



WORKFLOW

Workflow is a powerful tool. With this iOS-App, you can automate your individual repetitive work tasks. Workflow accesses various third party apps, combines certain functions and bundles them in a single button. After that, it is enough to tap that button to trigger a sequence of actions. A simple example is a workflow to post the most recent image in your dropbox folder to Instagram. The means are virtually unlimited, which is why Workflow is also called the Minecraft of productivity.



Full steam ahead!

Li-Ion TECHNOLOGY



Innovative STILL Li-Ion fleet – ready for your application.

STILL had started early to work with 'lithium-ion' and was already able to develop a number of industrial trucks with this technology. Today we are able to offer you a complete Li-Ion fleet. Be it low lift pallet truck or stacker, order picker or tractor, or counter balanced trucks – the STILL portfolio is constantly growing. The benefits of lithium-ion technology are at hand: The battery convinces with high performance and is especially well suited where lead-acid batteries were used and changed during two-shift operation in the past. Changing the battery is not necessary if it is a lithium-ion battery. Moreover it is possible to make effective use of idle times for opportunity charging. Find out more about the innovative Li-Ion family. www.still-zero-emission.com

first in intralogistics

STILL