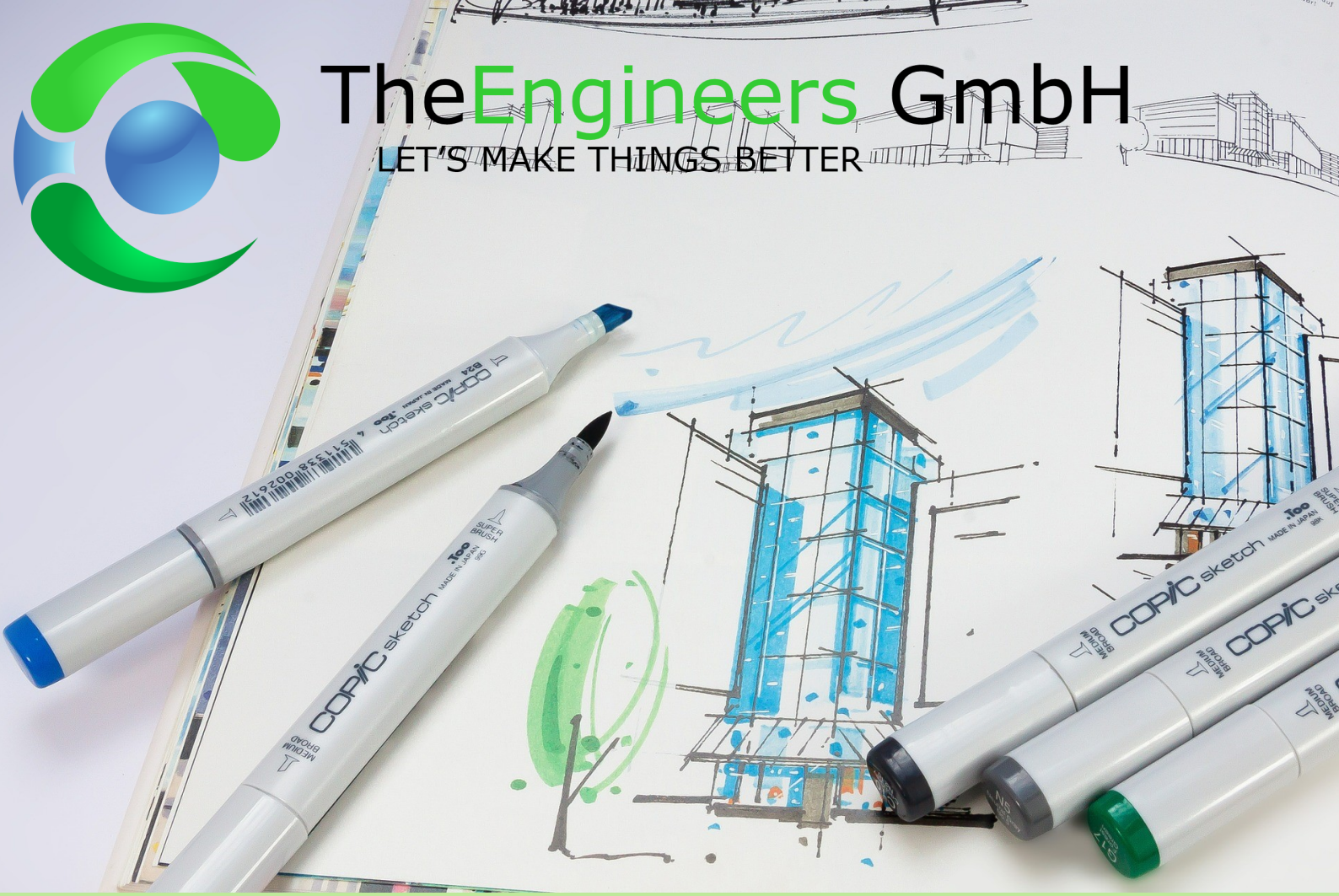
TheEngineers GmbH

LET'S MAKE THINGS BETTER



BUSINESS ENGINEERING

MARKET RESEARCH

DATA SCIENCE

CYBER SECURITY

» We optimize your business processes, offer market and competition analyses, generate knowledge from data and protect your IT systems from hackers and data loss. «

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ABOUT US

TheEngineers GmbH is a consulting and service company in the field of business engineering and aims to optimise company and production processes, offers market and competition analysis, extracts knowledge from data and advises companies in the area of cybersecurity. Scientific methods such as Lean Six Sigma, computer and data science as well as statistics are used. In the area of cybersecurity, we focus on the ISO 27000 and BSI (Federal Office for Information Security) standards. In addition, workshops as well as training and further education in the areas mentioned are offered.

BUSINESS ENGINEERING

Business engineering includes intelligent and innovative business processes through the integration of strategies, processes, organisations and technologies with engineering methods. It is about the systematic analysis, development and implementation of innovative business models using digital business processes and data-supported technologies. Practice-oriented analysis techniques and systematic project methods provide a solid basis for the planning and control of innovative and intelligent business processes in the areas of sales, production, logistics, procurement, administration and ensure the national and international competitiveness of companies and organizations in the long term. Production planning and control, digitisation, project management and organisational development are also cornerstones in the design and optimisation area between technology, organisation and business.

OPTIMIZING BUSINESS AND PRODUCTION PROCESSES

BUSINESS ADMINISTRATION

- Operating Cost Analysis
- Cost Centre Analysis
- Harmonise Processes
- Administrative Processes
- Product Management
- Employee Satisfaction
- ISO Processes and Audits
- Change Management

PRODUCTION MANAGEMENT

- Lead Times
- Tact frequencies
- Set-up-time Analysis
- Time Studies
- Work-flow Analysis
- Down Times
- Waiting Times
- Service & Maintenance
- Production Planning and Control
- Base Data
- Machine Capacities
- Personnel Capacities
- KANBAN
- Just in Time
- Production Costs
- Calculation
- Optimal Batch Size
- Technology Analysis
- Product and Process Development
- GMP Processes and Audits

GOODS MANAGEMENT/LOGISTICS & SUPPLY CHAIN MANAGEMENT

- Transport Times
- Transport Routes
- Transport Costs
- Order Costs
- Storage Costs
- Optimal Order Quantity
- Needs Analysis
- X,Y,Z Analysis
- ABC Analysis
- Inventory Turnover
- Supplier Evaluation and Selection
- Spaghetti Diagram

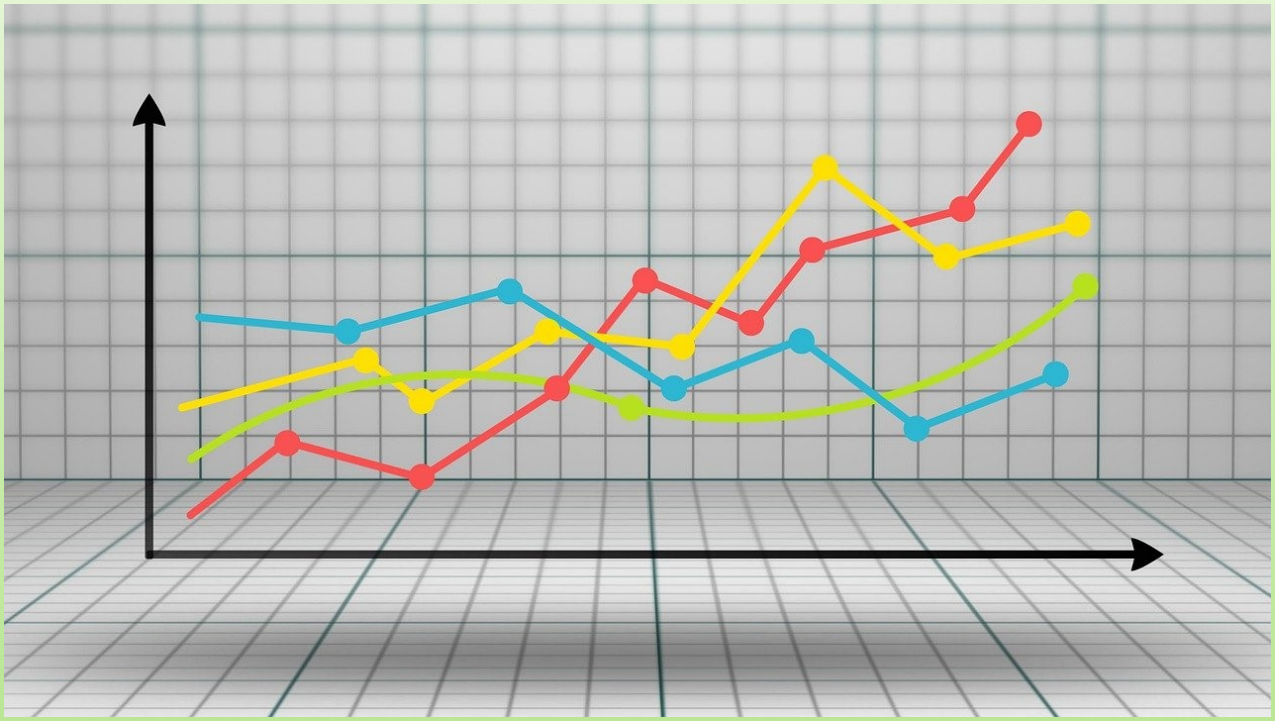
QUALITY MANAGEMENT

- Rejects
- Defects
- Customer Returns
- Customer Complaints
- Customer Satisfaction
- Lifetime Analysis
- Design of Experiments
- Root Cause Analysis
- FMEA Analysis
- Histograms
- Pareto-Charts

We improve quality, reduce costs and optimise contribution margins!

LEAN SIX SIGMA

The Lean Six Sigma method is a proven, recognized and systematic method to optimise processes and monitor them with statistical methods. The aim is to align the processes to the customers and to generate a consistently high constant quality of products, services and administrative services. The method includes a kit with various well-known instruments from quality management, but also from statistics and data science.



We monitor processes with statistical methods!

Lean Six Sigma is made up of the words Lean and Six Sigma, which are two different methods, but are used both individually and in combination to optimise processes, avoid waste and improve quality. The Lean method focuses in particular on the waste of:

- Defects (e.g. rejects in production, customer returns ...)
- Over production (e.g. too much produced units that are not sold ...)
- Waiting times (e.g. production lines that are not coordinated with one another ...)
- Transport times (e.g. too long internal transport routes ...)
- Stock levels (e.g. too many finished products in stock which are not sold ...)
- Movements (e.g. no coordinated arrangement of production lines, warehouses, etc.)
- Over processing (e.g. functions on products that customers do not use ...)

The Six Sigma method, on the other hand, focuses on managing, controlling and monitoring processes using statistical methods, with each process being oriented towards the customer. A process is controlled to be within plus or minus 6 standard deviations with the aim of reducing these fluctuations. The processes are shown in control charts with upper and lower limits. These limits represent customer needs.

EXAMPLE LEAN CASE

In a global software company, the sales and marketing department has grown rapidly. In order to meet market inquiries and to strengthen the market position, the sales managers regularly travel to their customers on site. The employees pay the travel expenses with their private credit cards and then submit the receipts together with an expense form.

For this purpose, a travel department has been created to process reimbursements and applications. Often the forms are sent back to the employees with additional questions before the payment is made. The travel department was expanded more and more in order to be able to process the flood of claim documents, which also increased the personnel and process costs of the travel department.

During an annual budget process, the Vice President wanted to know what this process cost and whether these steps are actually necessary. To answer these questions, the following data was collected:

- Number of reimbursement forms completed in the last month
- Total amount of the currently outstanding reimbursements to the employees
- Total amount of unauthorized reclaims in the last month

After receiving the data analysis, the Vice President was not surprised to learn that most employees are honest and that complaints are negligible amounts. The Vice President defined a new process in which the sales and marketing department only had to submit their credit card statements without an additional form. The amounts were no longer checked, but paid directly to the employees within 2 days.

In order to ensure compliance with this process, a control system was set up in which samples were checked at regular intervals. The system worked perfectly.

The staff of the previous travel department could be reduced to less than 25% of the previous stock, which lowered both the personnel and the administrative process costs and led to more motivated employees in the sales department.

This is a lean case with a focus on:

- Overproduction -> complicated process with unnecessary steps
- Wait -> employees have to wait too long for money refunds
- Transport -> Too many documents and information commuting between employees and travel staff

EXAMPLE SIX SIGMA CASE

A chemical company produces the Berlin blue colour pigment with a purity of 99%. Berlin blue was the first modern synthetic and lightfast colour pigment of the highest colour strength.

The chemical production per batch, including preparing and loading raw materials, chemical synthesis, filtration, drying and filling, takes an average of 36 hours. Both the degree of purity and the time for the chemical synthesis and the amount of the starting materials depend heavily on the purity of the starting materials potassium hex cyanoferrate (II), iron (III) salt and the quality of the water as a solvent. In the case of water, the dissolved minerals and the pH value play a major role, which is why the water is softened in-house before it is used as a solvent.

Process parameters are:

1. Berlin blue purity, target: 99%
2. Purity level of potassium hex cyanoferrate (II), target: 99%
3. Iron (III) salt purity, target: 98%
4. Conductivity water, 0.055 µS / cm
5. pH value water, target: pH 7.00
6. Production time, goal: 36h per batch

Samples of all 6 process parameters are taken at regular intervals as follows and examined in the laboratory:

1. Berlin blue: 1 sample à 500g in the filling process of the pigment
2. Potassium hex cyanoferrate (II): 1 sample of 500g upon delivery
3. Iron (III) salt: 1 sample of 500g upon delivery
4. Water: 3 samples per day of 500 ml each (6:00 a.m., 12:00 p.m., 5:00 p.m.)
5. Production time: in hours per batch

In order to guarantee a consistently high quality of the product, the production process and the throughput time, statistically determined mean values as well as lower and upper tolerance values are determined for the process parameters. The samples are entered in control charts in order to identify process fluctuations at an early stage and to be able to take appropriate measures.

Since chemical companies usually produce in batches, usually only one sample per batch can be taken as a sample. In this case, an IMR chart would be the right tool to monitor quality for the process parameters Berlin blue, potassium hex cyanoferrate (II) and the iron (II) salt as well as the production time. For the process parameter water, 3 samples per day would be taken in this example, which is why an XR control chart for the pH and the conductivity would be the right one to statistically monitor the quality of the water.

MARKET RESEARCH

Systematic collection, processing, analysis and interpretation of data on markets (customers and competitors) for the purpose of substantiating marketing decisions. Market research creates the prerequisite for companies to be able to orient their market-related activities to actual market conditions (and not to more or less well-founded assumptions, for example). It is therefore an important prerequisite for a company's market success.

MARKET- AND COMPETITION ANALYSIS

- Sales analysis
- Profit analysis
- Cost analysis
- Market potential
- Market volume
- Market share
- Production values
- Industry analysis
- Customer surveys
- Competitor Analysis
- Price analysis
- Trade channels
- Analysis of brands and packaging
- Analysis of competitive strategies
- SWOT analysis
- New business fields
- Location analysis and evaluation
- Ready-made lists of potential new customers

We create the basis for your market strategy!

„No customer ever buys a product. They always buy what the product does for them.“ *– Peter F. Drucker*

EXAMPLE MARKET RESEARCH CASE

A chemical company supplies bulk customers with chemical products in particular, serving the following sectors:

- Pharmaceutical Industry
- Chemical industry
- Animal Nutrition
- Human Nutrition
- Fragrance industry
- Plastic industry
- Packaging industry

In order to revise and focus their market strategy and to improve sales as well as earnings, the company would like to know how high the production value of the respective sectors is and which are the most relevant industrial sectors in Switzerland. The company also wants to know whether there are other sectors that could be interesting and lucrative for the company.

In a market study, various publicly available sources are analysed, data is collated and statistics and reports are created to answer these questions. The data basis for a new company / market and business strategy is created using the following sources as an example, but also others:

- Statistics from the Federal Statistical Office
- Statistics from chambers of commerce and industry associations
- Company reports
- Gartner trend studies
- Google Trends
- own industry know-how of the researcher
- own statistics and evaluations
- Universities databases
- personal interviews
- further sources

In addition, the chemical company would like a ready-made customer list with 80 potential new customers, including contact persons, who generate at least 500,000.00 sales per year and have at least one production facility in Switzerland.

DATA SCIENCE

Data science is an applied, interdisciplinary science. The aim of data science is to generate knowledge from data, for example to optimise corporate management or to support decision-making. Methods and knowledge from various areas such as mathematics, statistics, stochastics, computer science and industry know-how are used.

EXTRACTION OF KNOWLEDGE FROM DATA

- Structuring data
- Establishing connections
- Hypothesis tests
- Correlation / Multi-correlation analysis
- Analysis of variance
- Forecast models
- Statistical evaluations

„If you torment the data long enough, it will confess.“

- ici.pro, Data-Science quotes to remember

We structure data and generate new knowledge!

CYBER SECURITY

Cybersecurity, also known as IT security, refers to the practices, technologies and processes designed to protect computer systems, networks, programs and data from cyberattacks. The goal of cybersecurity is to ensure the confidentiality, integrity and availability of information. We work with the recognized standards ISO 27000 and BSI (Federal Office for Information Security).

- Protection from digital threats
- Securing data and systems
- Protection against data loss
- Protection of privacy
- Detect and respond to threats
- Ensuring business continuity
- Ensuring compliance

EXAMPLE DATA SCIENCE CASE

In 1852, many people in London died of cholera. The population tried to find the reasons for this and one theory at the time was that it was the stench in the air caused by waste and decaying material. Recommended measures were:

- Travel to places with clean air
- A bag full of bouquets of flowers
- Burn barrels of gunpowder

Believers in these theories were both Edwin Chadwick, the commissioner of the health authorities, and Florence Nightingale, the then famous nurse. But one man did not believe in these theories, it was John Snow (1813-1858), a doctor and epidemiologist. He has observed that in one house everyone is dead, while in the neighbouring house only a few or none have died. While all of these people were breathing the same air, the theory that the stench of bad air led to cholera couldn't be true, he thought. He focused more on the symptoms of the sick and concluded that it had to be related to drinking or eating. He focused on the theory that poor water quality must be the cause.

To confirm his theory, he started to visualize the problem on a map of London, which is now the standard in data science techniques. He drew a rectangle for each address, which represented how many dead there were. The longer the rectangle, the more deaths there were at that address.

Because he thought the dirty water was the cause of cholera, he also marked the water pumps on the same map. He found that many of the dead were concentrated around the Broadwick Street pump. He therefore assumed that the disease was spread from here.

Now he had to explain how to explain the dead in the houses that were not located around the pump on Broadwick Street. He found, for example, that some of the residents of the houses not located on Broadwick Street were schoolchildren who drank from the Broadwick Street pump on the way to school. He then recommended removing the handle of the pump so that no one could drink water from the pump.

He compared the water suppliers in another map and found out that there were S&V and Lambeth. Lambeth took their water upstream before a tributary flowed into the Thames, which was contaminated. However, S&V took their water downstream of the tributary. He compared the houses in London where both companies supplied water and found that there were more deaths in the houses where S&V supplied. He calculated the death rate per 10,000 houses, which was 315 for the houses supplied by S&V and 37 for Lambeth. The water pump on Broadwick Street was supplied by S&V. With this, John Snow also demonstrated the causality for his observations and measurements.

WORKSHOPS

We offer workshops on the topics of Lean, Six Sigma, Change Management and Data Science directly at your location.

Well-trained employees ensure better quality!

„It is not the strongest species to survive, nor the most intelligent, it is the one that is most likely to adapt to change.“ - Charles Darwin

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Fight with us for improved quality!

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