International Controller Association

NEWS Dream Factory | Quarterly

Issue 19 | April 2016

Dear Readers,

In the last two newsletters we already gave you insights into our current main topic of *Business Analytics*. The work on the Dream Car Report **"Business Analytics | The road to data-driven corporate performance management"** is now nearly complete.

In this issue of our newsletter we first go into detail about the challenges arising from business analytics, paying special attention to the role of controlling. Then, we present a standardized procedure for using business analytics. Finally, we take a look at the analysis methods used in business analytics.

We hope you enjoy reading this issue of the Dream Factory Quarterly.

Best regards,

Siegfried Gänßlen
Chairman of the ICV board

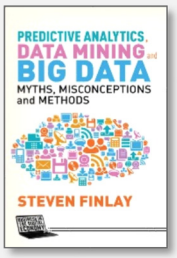
Prof. Dr. Heimo Losbichler
Deputy Chairman of the ICV board

Prof. Dr. Dr. h.c. mult. Péter Horváth
Head of the ICV Dream Factory

Dr. Uwe Michel
Head of the ICV Dream Factory

Suggested Reading

In his book **"Predictive Analytics, Data Mining and Big Data – Myths, misconceptions and methods"** Steven Finlay pays special attention to the use of predictive analytics, including a description of how predictive analytics models can be designed and implemented. In this context, he also deals with specific specialized fields such as text mining. Additionally, the book focuses on the technologies for implementing predictive analytics.



In their book **"Multivariate Analysemethoden – Eine anwendungsorientierte Einführung"** (*Multi-variate Analysis Methods – An application-oriented introduction*), Klaus Backhaus, Bernd Erichson, Wulff Plinke and Rolf Weiber explain the methods used in business analytics. Thanks to concrete business cases, even those readers with comparatively little knowledge of statistics can familiarize themselves with the underlying principles and methods of business analytics. The 14th edition of the book was published at the end of last year.

The complete Dream Car Report **"Business Analytics | The road to data-driven corporate performance management"** will be published in the very near future, after which it will be available for free download on our website:

www.icv-controlling.com/de/arbeitskreise/ideenwerkstatt

The Role of the Controller | The advantages of an extended competence profile

The use of business analytics was investigated as part of the current KPMG study "Creating Value with Data". Alongside the objectives and challenges of individual analysis methods, the study also considers the data sources and technologies used (cf. Erwin/Heidekamp, 2015). In our last Quarterly we took a closer look at some of the interesting findings of this study. In the following section we would like to turn our attention once again to the results of the study and this time focus on the main hurdles to using business analytics.

Hurdles when using business analytics

Generally, there are different types of hurdles to overcome when using business analytics. According to the findings of the study there are three main sticking points: Dissemination of data to third parties, lack of budget, and lack of analysis specialists (cf. Figure 1). Concerning the last point, it should be noted that the successful use of business analytics does not depend on individual "experts". Business analytics – as a digital performance management instrument – only achieves its full potential through the combination of expert and industry knowledge, methodological skills and the entrepreneurial spirit of the interdisciplinary experts and managers involved. While data scientists analyze the data to find correlations relevant to performance management and IT experts implement the necessary software tools, the interpretation and processing of the findings is the responsibility of controlling and the management. The results from the models and analyses reveal, for example, probabilities which the functions can use in decision-making and performance management.

The role of the controller in detail

An extended competence profile of the controller can have many decisive advantages when it comes to correctly interpreting and processing the results of business analytics. As a rule, the successful use of business analytics requires the application of what are at times extremely complex statistical methods and the development of algorithms for automated decision-making. While controllers do not have to become statistics experts or experts in higher mathematics, nevertheless it is advantageous if they can grasp the general principles underlying the analysis methods being used. Here the focus is not on the details of the various steps in the individual analysis methods but rather on understanding the fundamental applications and the advantages and disadvantages of those methods. This can be a major contributor to better intuition when it comes to interpreting the identified correlations or recognizing the causalities behind those correlations.

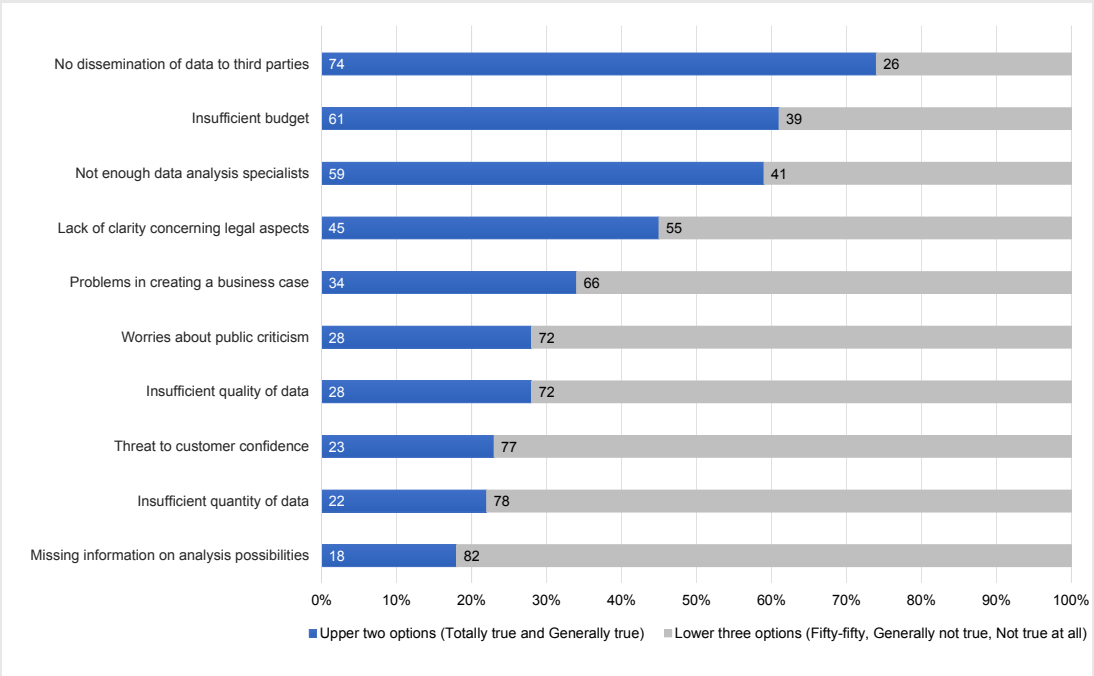


Figure 1: Hurdles when using business analytics (based on Erwin/Heidekamp, 2015, p. 23)

The CRISP-DM Model | An approach to successfully implementing business analytics

IT projects often cause high costs. That is why it is important to have an effective and efficient approach, especially in the implementation phase. In this context, one approach that lends itself particularly well to the implementation of business analytics is the CRISP-DM model (cf. Figure 2). CRISP-DM stands for Cross-Industry Standard Process for Data Mining. Data mining is the process for discovering patterns and previously unknown causal effects from large data sets. The CRISP-DM model was developed as part of an EU project which was led by renowned companies from different industries and is widely used in corporate practice.

CRISP-DM breaks the process of data mining down into a total of six successive steps. These steps form a sequential procedure although different feedback loops exist.

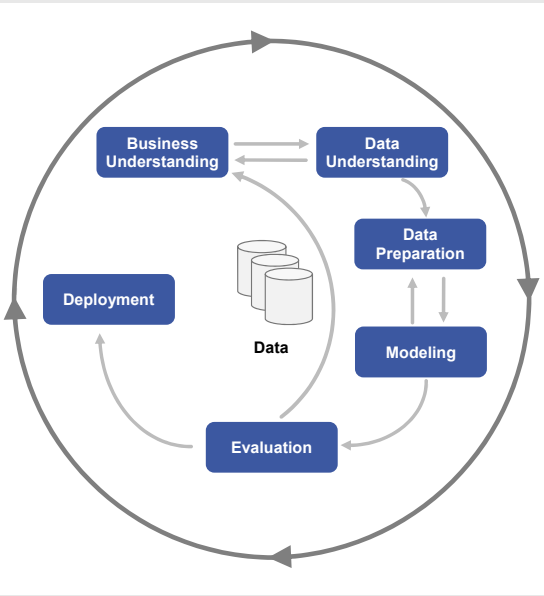


Figure 2: Steps in the CRISP-DM model (based on Gabriel et al., 2009)

Business understanding

The first step involves defining the specific project objective for the business analytics deployment and elaborating a project plan. It is particularly important here to define the specific end result or optimization the business analytics should lead to, for example that the company wants to have a better understanding of its customers or be able to create more precise forecasts.

Data understanding

After the project objective has been defined, the next step is to find relevant data. This raises the question of which data must be analyzed in order to reach the desired project objective. For this, data must be collected from different sources, with both internal data (e.g. data warehouse) and external data (e.g. social media) being included.

Data preparation

The third step is to process the selected data for the subsequent analyses. This step can use up to 80% of the time, technical resources and staffing allocated to the whole business analytics deployment. The following criteria can be used to assess the quality of the data: Completeness, consistency, preciseness, correctness and up-to-dateness. The last part of this step is to construct the final data set in the scale required for the analyses (e.g. metric, nominal, ordinal etc.).

Modeling

During the modeling step, the analysis methods required to complete the project are selected and applied, and their parameters are calibrated to optimal values. The results of the analyses must have high informative value or be easy to interpret. Generally, the analysis methods used come from the fields of cluster analysis, classification, numerical predictions, association analysis, text mining or web mining (cf. page 4 of this Quarterly).

Evaluation

Before proceeding to final deployment of the model, it is important to more thoroughly evaluate the model to be certain it properly achieves the business objectives. It is vital to critically assess both the results of the analyses and the whole business analytics process. For the former, the focus is on, for example, validity, novelty, usefulness and comprehensibility. A critical analysis of the quality of the process itself serves to reveal weaknesses and derive any necessary improvements.

Deployment

The final step in the use of business analytics consists of defining the way in which the results should be used in the company and which measures should be initiated based on the findings. Here were differentiate between one-time and permanent use of the results. When it comes to permanent usage, it is important to monitor the models set up in Step 4 to ensure they remain valid and, if necessary, to modify them. Finally, the models must be integrated into the company's performance management system.

Business Analytics | An overview of the main areas of application

An important success factor in implementing business analytics is the identification, modification and application of the analysis methods most suitable for the specific task in hand (cf. page 3 of this Quarterly). The possible analysis methods can be broken down into six main areas of application (cf. Figure 3). A detailed explanation of these areas of application is contained in the upcoming Dream Car Report.

The objective of the **cluster analysis** is to break a given set of objects down into subsets (called *clusters*). Objects in the same cluster should be more similar (in some sense or another) to each other than to those in other clusters.

In contrast to the cluster analysis, in **classification** the characteristics of the subsets (called *categories*) are already known so they do not need to be identified first. The objective of classification is to allocate existing data sets to these categories.

The objective of **numerical predictions** is the forecasting of numerical values. As a rule, the prediction of the values results from the approximation to functions. Functions are calculated with the help of existing data sets. These functions approximately reflect a process or trend.

The aim behind an **association analysis** is to extract correlations from a data pool. The classic use case is the *shopping basket analysis*. Here association rules are identified, such as: Someone who buys product A often also buys product B.

Text mining deals with the analysis of text documents. In contrast to conventional databases, texts are unstructured data. This data is characterized by the fact that the information supplied cannot be allocated to any standardized format.

Web mining stands for the explorative analysis of content from the Internet. Depending on whether content-based analyses or usage-based analyses are used, in web mining we differentiate between *web content mining* (data from the Internet) and *web usage mining* (behavior and Internet users).

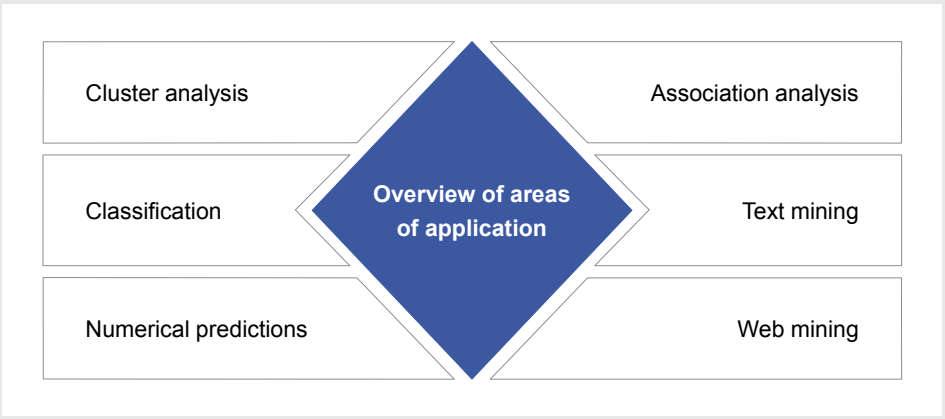


Figure 3: Overview of areas of application (based on Cleve/Lämmel, 2014)

References

Cleve, J./Lämmel, U., Data Mining, Munich 2014.
Erwin, T./Heidkamp, P., Mit Daten Werte schaffen – Report 2015, Berlin 2015.
Gabriel, R./Gluchowski, P./Pastwa, A., Data Warehouse & Data Mining, Herdecke 2009.

Imprint

Publisher and Copyrights
International Controller Association
Dream Factory
Siegfried Gänßlen
Prof. Dr. Heimo Losbichler
Prof. Dr. Dr. h.c. mult. Péter Horváth
Dr. Uwe Michel

Editing
IPRI gGmbH
Dipl.-Kfm. techn. Goran Sejdić
Königstr. 5
70173 Stuttgart
Telefon: +49 (711) 620 32 68-8022
Telefax: +49 (711) 620 32 68-1045
GSejdic@ipri-institute.com

Core team of the Dream Factory
Prof. Dr. Dr. h.c. mult. Péter Horváth
Dr. Uwe Michel
Siegfried Gänßlen
Prof. Dr. Heimo Losbichler
Manfred Blachfellner
Dr. Lars Grünert
Karl-Heinz Steinke
Prof. Dr. Dr. h.c. Jürgen Weber
Goran Sejdić

International Controller Association
Main Office
Münchner Str. 8
82237 Wörthsee
Telefon: +49 (0) 8153 88 974 - 20
Telefax: +49 (0) 8153 88 974 - 31
www.icv-controlling.com
verein@icv-controlling.com