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FOREWORD

Two and a half years have passed since the last edition. During this time, digitization has continued to accelerate. However, many companies are also struggling with difficult economic conditions while at the same time needing to invest in the technology sector – the need for knowledge and orientation has therefore increased.

This book intends to play a part in the transfer of know-how. In order to make the developments for cross-media production and their interrelationships transparent, the contents have been almost completely revised, updated and supplemented. One important objective is to take a holistic perspective and cover both the print and digital sectors.

Another challenge continues to be the multitude of software solutions on the market. To help companies define their own requirements and strategies more clearly and classify systems correctly, I have developed a new method, the “marketing and communications ecosystem”, which is presented in a separate chapter.

Ultimately, it is about maintaining competitiveness and using resources and investments as effectively and purposefully as possible.

The target groups for the book are companies across all sectors, such as industrial and com-

mercial enterprises, the public sector, agencies, publishers, media service providers and print shops.

Experts and organizations have again contributed valuable technical articles. The implementation in practice is thankfully illustrated in a clear and varied manner by practical cases from authors of the software providers.

17 associations, organizations and multipliers contribute to the dissemination of this book through their support. I would also like to thank them for their trust, loyalty and active assistance.

The proven publication forms with printed edition, PDF and e-paper will be retained in order to do justice to the topic on the one hand, but also to the preferences of the readers on the other.

I would be very pleased to receive your suggestions and comments (ira@melaschuk-medien.de) and hope you enjoy reading this issue!

Ira Melaschuk
Friedberg (Hessen) in May 2022

1 TRENDS AND REQUIREMENTS

Artificial intelligence permeates processes

Artificial intelligence (AI) applications are already part of everyday life in many cases – and often unnoticed. In media production, the use of AI begins with creative processes such as layout and text creation, and extends to data maintenance with automated metadata generation, through to the personalized playout of websites or the creation of print products tailored to individual recipients (“Programmatic Printing”).

Sifting through large amounts of data is a core task of AI and thus editorial offices benefit from automated research and the provision of text and image material.

Data protection leads to realignment in marketing

Personalization of advertising materials and publications is becoming increasingly important in marketing and communications. However, data protection regulations are making some long-established recipient targeting tools obsolete. Direct contact by phone or e-mail requires explicit consent, and when visiting websites, users must also first consent before their activities can be logged for marketing purposes.

The future discontinuation of the use of so-called third-party cookies also presents many players in digital marketing with the difficult challenge of finding a replacement in the context of target group determination.

In order to be able to act more independently under these delicate conditions, an important strategy in companies is to build up the company’s own contact data, the so-called first-party data.

The goal is to obtain the data basis for playing out target group-oriented content for beneficial customer experiences.

Making IT infrastructures more flexible

Rapid changes in requirements and a growing number of output channels are increasingly leading to the establishment of systems that are flexibly structured via best-of-breed components or microservices. Functional units, which may also be able to work stand-alone, are connected or supplemented via interfaces to form executable systems.

The terms “headless” or “API-first” are also mentioned in this context.

These concepts provide for a separation of the front-end units, i.e., the output channels such as website, store, or app, from the back end. This is intended to make data management and processes independent of the device display and more flexibly interchangeable or expandable.

However, this flexibility requires high demands on IT resources to develop and maintain these interfaces and to keep all components functional.

It is questionable whether these concepts are in any case suitable for solving the problem of IT isolated applications in companies. If one wants to realize a uniform user interface for users of different systems and at the same time achieve rapid system introduction, integrated solutions that already have the desired functions or output channels may be the better option. At the same time, integrated systems must have open interfaces for connecting external systems.

In general, it is important for all IT concepts to establish and maintain a central, media-neutral database for sales, marketing and communications in order to be able to output data to a wide variety of media channels and languages on a uniform basis.

Other developments are advancing and will soon determine our everyday lives more and more. These include virtual reality, which has attracted particular attention through the “metaverse” of the company Meta (renamed from Facebook), augmented reality as a digital extension of the physical world, as well as voice control and accessibility, with the latter requirement already established by law.

1.1 Print product development with digital marketing mechanisms

BY RÜDIGER MAASS UND HARRY STEIERT

Multichannel publishing and digital marketing mechanisms are always an approach for advertising companies to “remix” their communication and advertising activities. Unfortunately, it is often the case that these approaches only “re-sort” and re-prioritize existing technologies, output channels and associated media. The actual examination of new product development usually comes up short or is not on the agenda. The task is to redefine the existing framework, link it to the requirements of the customer journey, and then consider what customers really need.

This is already being practiced with digital media. However, the fact is that digital “overflow” is increasing due to the amount of digital information and impressions are quickly forgotten. Despite intensive individualization, there is a relevance problem here for the recipient. Additional attention can be generated here through print. But not in the classic presentation form, but reinterpreted, with available technologies that make print today not only fast, but individual, multisensory and efficient. Developing these new print products and communication concepts requires creativity and knowledge of digital marketing mechanisms.

Physical media are experiencing a “revival” – but now with a more conceptual approach towards full individualization, which includes Programmatic Printing. Programmatic printing is initially based on two terms. Programmatic, i.e. target-oriented and trend-setting, and print, i.e. printing.

We are therefore talking about print products that have been generated in a target-oriented and concrete way with the help of automation and programming. Programs or entire software systems have created the individual print product, i.e. the flyer or the catalog page – sometimes only on the basis of design guidelines and layout templates.

Basically, Programmatic Printing describes the process of how successful marketing mechanisms from the online world can find their way into the analog world of print.

Years ago, the online world began to individualize marketing measures very specifically based on the respective potential wishes of the individual customer. This has given rise to measures and systems that help to adapt the websites of an online retailer to specific users. The online information for the customer changes dynamically, in real time and adapted to the customer, controlled by customer profiles.

From this environment come terms such as:

- Multichannel / Omnichannel / Crosschannel
- Up-selling
- Churn prevention
- Next Best Offer
- Dynamic Pricing
- Recommendation Engine

We encounter digital, personalized information all the time, in many websites and in our completely overcrowded e-mail inboxes. As a result, many people already filter out what looks like advertising – and what has not already been technically filtered out by the ad blocker.

This is exactly where Programmatic Printing analog comes in! What are the special features? We are not used to receiving analog messages from the digital world. The expectation is that communication stays in its respective media world. It is precisely this change that attracts customer attention. Another advantage is that in the analog world there are far fewer barriers to contact, such as double-opt-in or consent rules – a fully addressed letter does not require consent. Then there are the multisensory elements of print, which can have a lasting impact. And ultimately, it's possible to get into a recipient's personal comfort zone with relevant content.

Omnichannel marketing is the most modern form of addressing customers, which is a further development of crosschannel marketing. Basically, the difference in omnichannel from crosschannel is that every channel is integrated without exception and communication revolves around the customer as the central focus. This means individual channels are activated that may not even have been discovered by the customer himself. Omnichannel marketing follows its own initiative strategy even more strongly than crosschannel in order to serve the customer broadly, taking all touchpoints into account. It also evaluates data more comprehensively and uses it for other channels.

The advantage here is that the strategic decision for the selection of media channels is no longer made by a marketing manager, but by the system, which decides on the basis of the customers' requirements. In order to inspire the further development of ideas for product development even more, other mechanisms are relevant.

Customers Best

“Customers Best” data is used to segment (classify) meaningful customer groups. Segmenting customers is always useful when programmatic printing products are to be generated not only for individual persons, but also for a specific target group to which uniform information is to be directed. This would be a partial individualization in order to summarize further data about

the customers. In this way, alternative products can be offered to customer groups with special interests, for example.

Churn prevention

The measures described here all serve the purpose of churn prevention. In essence, the objective of churn prevention is to prevent customers from leaving the business. Until now, with the exception of programmatic printing, all analog marketing has been excluded from churn prevention. When the typical digital measures, such as dynamically generated and personalized banners or mailings, no longer work, it becomes clear that the customer has already activated his internal filter, sorts out the typical digital advertising messages and no longer reacts to them. Here, through a programmatic printing strategy, the above-mentioned element of surprise can be the decisive element in winning the customer over again. Here, analog communication bypasses the customer's usual and learned defenses and prepares a new experience for him.

Customer lifetime value

Acquiring new customers is more costly than keeping existing ones. So what could be more obvious than bringing customers back with a print product? Based on the individual information available, a print product is created that draws the momentum back to the supplier side. It is all too common for customer lifetime value analysis to focus on the fact that online

measures are extremely cost-effective. This is because the customer lifetime value describes the value or contribution margin that a customer realizes during his "customer life".

Of course, the actual success control must then also prove that something is actually achieved with these favorable measures. Due to the reactions described above with print communication, such as the customer's expectations, the element of surprise, the sustainability of paper communication vs. digital communication, and no need for consent for push notification, the prospects of a positive reaction by the customer are proven to be greater.

Next-Best-Offer

Just as the customer journey should be designed as a comprehensive positive experience for customers, the next-best-offer strategy is another marketing element for optimizing the individual customer experience. The next-best-offer strategy creates an optimal offer and thus experience for the customer with the help of machine learning based on all the data available around the customer. Due to the large amount of data and the resulting action possibilities, the so-called best-offer actions, automation must reasonably ensure when, what and in which way is brought to the customer.

Dynamic Pricing and Dynamic Couponing

Dynamic Pricing and Dynamic Couponing determine how advertising companies can achieve the highest possible profit margin with as many customers as possible. Dynamically generated prices and discounts are used to determine exactly the value that the customer is willing to pay and which at the same time provides the greatest possible profit margin. Gas stations, for example, have always operated dynamic pricing, even several times a day. Algorithms observe several factors and then determine a price again and again.

Conclusion

These and other digital marketing mechanisms are an essential basis of functionality for print. The task now is to develop appropriate print products and put them into practice using existing technologies. The objective is not to do omnichannel publishing because the technology is available, but to create an individual experience for customers – optimally multisensory, and that can be done with print.

This article contains extracts from the whitepaper “Digital Marketing Mechanisms and their Derivation to Print – and (Almost) Everything You Need to Know...”. Published by Fachverband Medienproduktion e.V. (f:mp.) and Programmatic Printing Alliance (PPA).

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2 **SETUP AND OPERATION OF WEB-TO-PUBLISH SYSTEMS**

SUMMARY

In this chapter, the general conditions for the operation of web-based publication systems are first presented, such as benefits and requirements. From this, the user's own individual requirements for the sensible use of solutions can be derived. One focus is on the measures for establishing user acceptance in order to use investments and resources in a target-oriented manner.

The basic functionality of web-to-publish systems is then presented in clearly structured diagrams. Current developments in IT system architectures are difficult to distinguish from one another, such as best-of-breed, microservices, API-first, headless or cloud-native. The aim here is to establish clarity, because this is the only way to assess developments and develop your own strategies.

The project management chapter then deals with agile and classic processes for system selection and subsequent system development, which form the organizational framework for the technical developments. This closes the circle from strategic considerations to concrete implementation.

2.1 Advantages and risks

The advantages

For marketing, communication and media production, the following advantages result from the use of web-to-publish systems and marketing portals:

- Products and services are available around the clock and can be used regardless of personnel and geographical conditions.
- Time and cost savings result from the central maintenance and administration of media objects (such as images, videos, audio), (multilingual) product data and texts as well as their cross-media multiple use. The quality is increased by the uniform reproduction of data in several media channels and legal requirements, such as compliance with license periods, can be secured automatically.
- The possibilities of automation during playout in media channels shorten the “time-to-market” span, i.e. the fastest possible publication of products, marketing measures and publications.
- The provision of printed and digital advertising media can take place in decentralised companies for branch offices, branches, dealers or agents in accordance with corporate design.
- Especially with high order rates for templates with low adaptation effort, cost savings result from the system operator's own services and those of its sales partners.

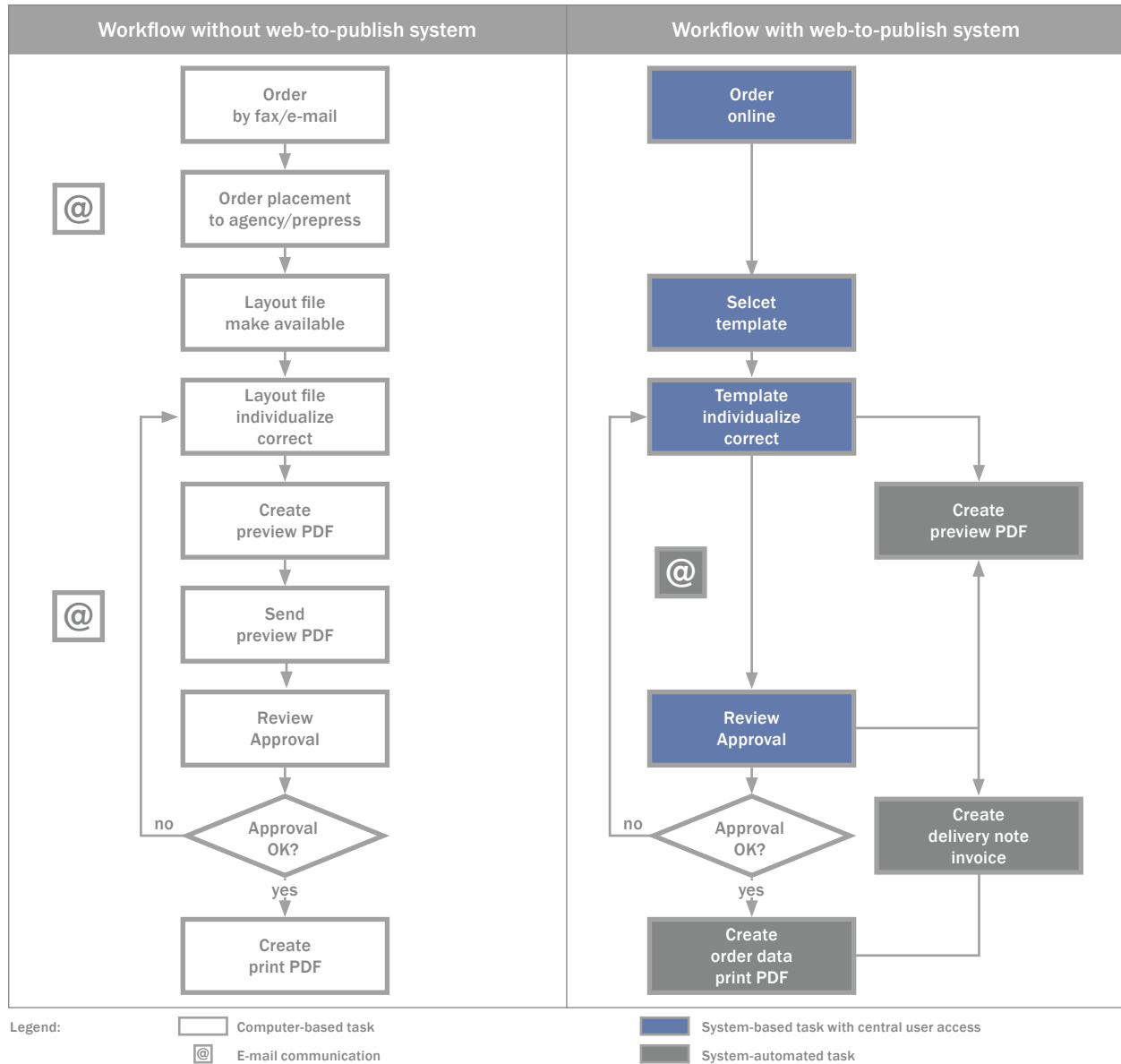


Fig. 2.1 Workflows without and with web-to-publish systems. © Melaschuk-Medien

- Time savings and quality improvements result from system-controlled, automated processes, such as PDF creation or e-mail message delivery (Fig. 2.1).
- Savings in costs for administration and commercial processing through centralized order processing for the entire company are possible. Printing and shipping costs can also be reduced by centralizing printing locations and logistics centers.
- Storage costs can be saved by the demand-oriented production of advertising material.
- Communication is fast and reliable between production partners such as graphic designers, translators, editors, agency staff, marketing and sales. It is independent of time zones.
- There are transparent control and steering possibilities regarding projects, campaigns, time, costs and activities.
- Content that is managed in independent IT systems, such as merchandise management, media database or web shop, can be merged.
- Legal requirements can be secured through change tracking, versioning, differentiated approval processes and user rights.

The risks

However, these advantages also face the following challenges:

- Companies often lack a uniform, cross-media channel, organizational and technical basis that needs to be designed and implemented.
- The conceptual effort for introducing a web-to-publish system should not be underestimated and may require the provision of personnel resources from various departments and external partners of a company.
- In the course of a system introduction, but also for the running operation, permanently new tasks can arise, e.g. for media administration, template creation, system administration or setting up an end user hotline.
- Costs are incurred for setting up, running and integrating the system into internal and external systems.

Data security, data protection and data ownership are other aspects that are important for companies and should be clarified when using a web-to-publish system. It is possible that internal company guidelines already exist which must be complied with.

The necessary standardization of work processes and advertising media should also be accepted in principle within the company. Because the one-time expenditure of the system installation is to be amortized by the savings in

the current enterprise by means of the multiple use of standardized collecting mains and uniform operational sequences. Alternatively, it is possible to use the web-to-publish system for certain advertising materials only for correction and coordination purposes and to have the layout design carried out by external agencies and service providers outside the system in advance.

2.1.1 User acceptance

The frequently cited customer experience also includes the user experience, which describes the experiences made during contact or interaction with products, services or software. These are rightly important aspects, as the number of media channels and thus touchpoints with which consumers come into contact before making a purchase, for example, is increasing.

In the context of software use, this includes usability, which significantly determines the extent of user acceptance. The affected employees should therefore also be involved at an early stage in the system concept.

Negative influences on user acceptance

Some factors have a negative impact on user acceptance:

- Users have no financial incentive (e.g. through advertising subsidies).
- Users do not see any advantages compared to the usual processes.
- Users are not bound by the company's instructions to use the system.
- Users have connections to existing suppliers and bypass the system.
- Users find the operation of the system too slow, complicated or difficult.
- Users are not very flexible or motivated in dealing with computers.
- Users rarely use the system and do not achieve a high level of practice.
- Users do not accept the standardized templates offered in the system.

Measures to increase user acceptance

There are a number of organizational and technical measures that companies can take or use to achieve the highest possible degree of utilization of a marketing portal or web system:

- The portal should be user-friendly in terms of design and operation and optimized for mobile devices.
- Fulfillment of requirements for accessibility.
- Realization of short page loading times.

- Fulfilling of security standards, such as TSL/SSL data transfer.
- Offer of interactive elements including voice control.
- Design the portal offer comprehensively and attractively in order to make the use of several portals and applications redundant.
- Use of a digital consulting assistant that guides users step-by-step to the right products or campaigns according to their needs.
- An automated ordering process with short click paths (automatic transfer of master data, direct transfer of products into the shopping basket).
- Organize and personalize the portal offering with various access options (selection of individual advertising media, themes, campaigns or actions).
- Providing attractive advertising media by combining standardized templates with individual design variants or layout functions.
- Combinable and storable search and filter functions.
- Providing supplementary information on the individual advertising media or options (text information, explanatory videos).
- Selection of advertising media on the basis of geodata (display of advertising media reach depending on locations) and market potential.
- Telephone consultation as part of an extended user hotline (first-level support).
- Training and information events for portal users.

Despite these requirements and risks, web-to-publish systems often make sense for companies to stay competitive. Only on a central technology basis can information be made available in ever shorter time, with current data simultaneously in several media channels.

2.2 Technical setup

The technical structure of web-based systems and platforms is described below in two overviews, a simple basic structure and a detailed overview.

2.2.1 Basic structure

A web-to-publish system can basically be classified into frontend (presentation layer with graphical user interface), backend (application with functions and administration layer on a web server) and media channels (Fig. 2.2).

System frontend

Users access the application via the system frontend using a web browser, so there is usually no need to install additional application software.

Offline applications that are not permanently connected to the system online are used, for example, in the areas of template creation or editing. Offline editors or applications can be installed locally and are used by graphic designers, editors or translators for template preparation or content capture, for example. If required, synchronization with the web application or access to databases takes place.

It is important to differentiate between system frontends for operating web-to-publish systems

and media channel frontends, such as an app for a web store.

Backend

The backend with the application is located on a web server. The entire server structure can be individually configured. Web servers, database and file servers, and other servers with special tasks, such as publishing or mail servers, can be parts of the entire system.

The applications have a wide diversity of focus areas and functions: Store or CMS modules, marketing automation, planning, individualization, personalization, collaborative or automated publication creation, translation management, analysis or even reporting (Fig. 2.3). The technical functions result in the options for creating the printed and digital media channels or advertising material portals.

All settings that coordinate and control the technical and organizational processes are made in the administration area. These include user and rights management and workflow definition.

Workflows are processes in a logical sequence of work steps that can trigger actions, such as sending e-mail notifications or transferring publications to other servers. Users access the central system and act according to their permissions and the defined workflows.

Media channels

Media channels can be differentiated into print, digital, or items, such as merchandising. If a media channel corresponds to a frontend, this is referred to as a “media channel frontend”, for example a web store app.

2.2.2 Detailed overview and system concepts

The detailed overview (Fig. 2.3.) is intended to show a possible, comprehensive concept of an IT architecture for a platform for marketing and communication with exemplary data sources,

applications and media channels. In practice, a wide spectrum of different designs are implemented.

In the following, we discuss concepts presented under the keywords “monolithic or integrated systems”, “best-of-breed”, “microservices”, “API-first”, “headless” or “digital experience platforms”.

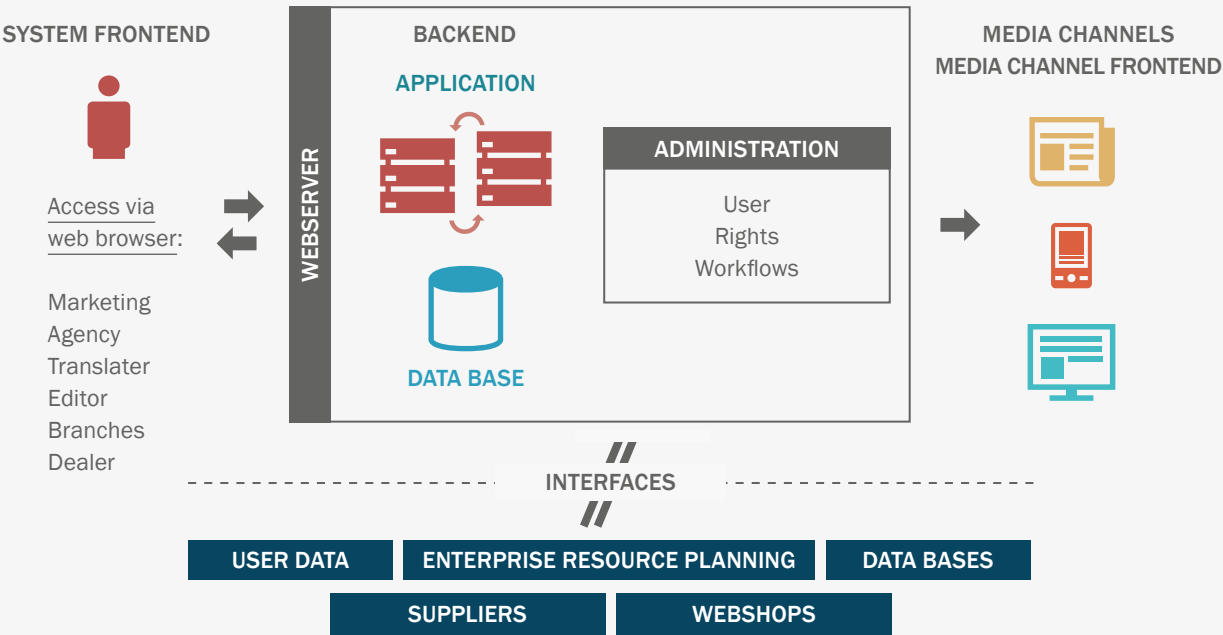


Fig. 2.2 The basic structure of a web-to-publish system. (© Melaschuk-Medien/skarin - Fotolia.com)

2.2.2.1 System architecture: integrated vs. best-of-breed

A fundamental differentiation in system architectures is that web-to-publish systems are either developed by a single provider largely with integrated functions and operated stand-alone, or are put together on the basis of a framework and application programming interfaces (API).

Integrated systems

In integrated systems, also called “monolithic”, as many requirements as possible are to be realized with a single system. The frontend and backend are closely interlinked, and the development, modification or failure of one function usually affects the overall system in a great many areas, which in turn have to be adapted. The more extensive and complex the system, the more significant the effects.

It is certainly the case that integrated systems generally offer the option of licensing individual modules. In fact, however, these modules are usually not modular at the technical level. Interfaces are created as needed, for example to import user data to avoid multiple data maintenance or to access a media database.

One advantage of integrated systems is that they are quickly ready for use once all the desired requirements have been realized.

Other advantages include ongoing functional system maintenance by a responsible provider, from which all customers can benefit. Standard functions can be updated, maintenance costs are easy to calculate, and administration is consistent throughout the entire system.

In order to achieve greater flexibility in the implementation of new requirements when using integrated systems, there is a trend to transform the entire system or parts of it for a best-of-breed architecture.

Best-of-Breed Systems

In the “best-of-breed” concept, stand-alone applications have standardized, well-documented interfaces and are interconnected. A typical connection is between web CMS (web content management systems) and store systems. In store systems, CMS functions are often only rudimentary, such as for help or FAQ pages. The more advanced CMS functions are needed to provide more extensive content, such as a blog or product content pages.

For best-of-breed systems, individual components can be licensed from different providers and integrated step by step on one platform. Existing, integrated systems can also be combined with new ones. This hybrid approach enables connection to external services or components via interfaces in addition to the integrated overall solution. This can be useful if

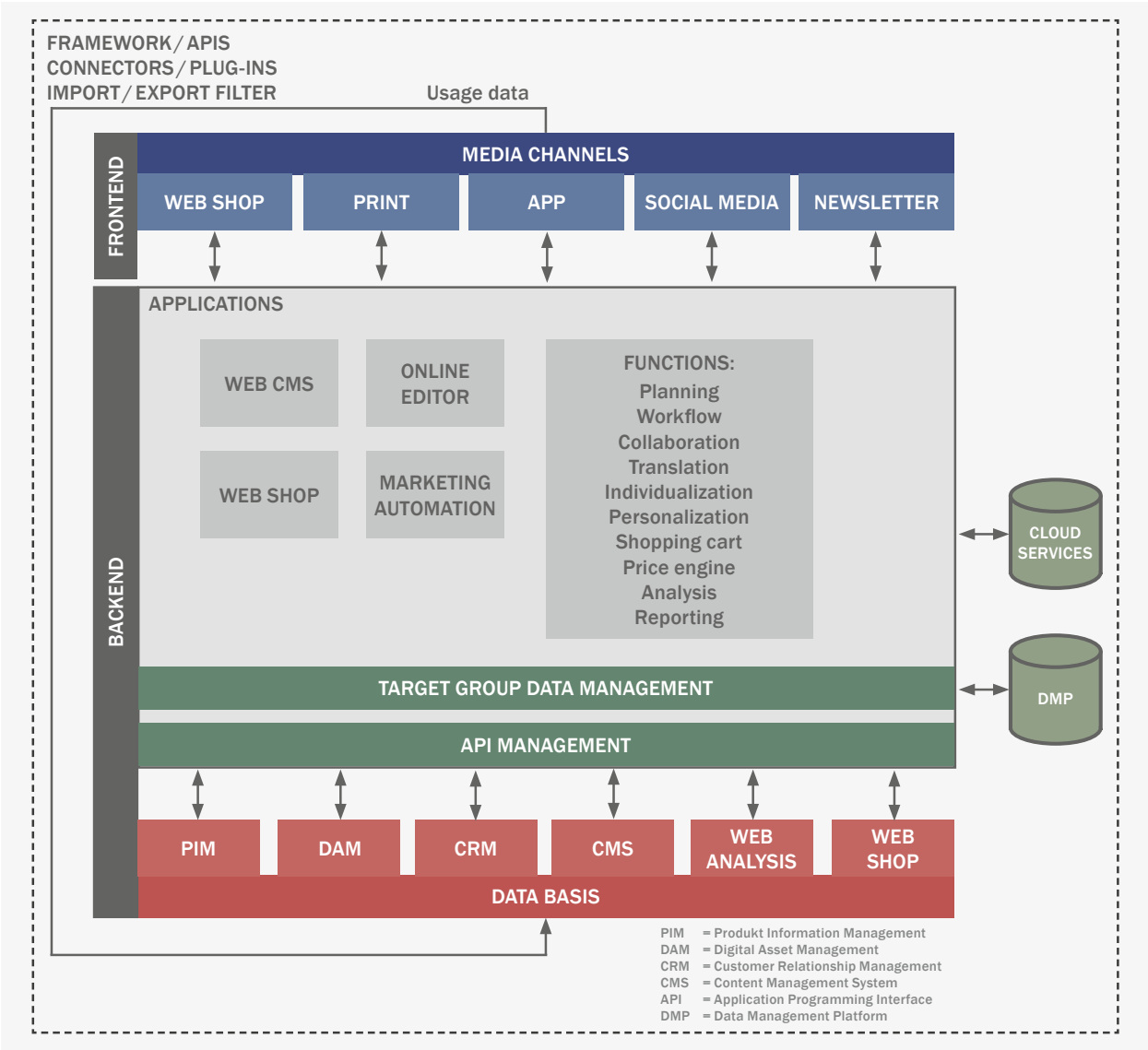


Fig. 2.3 Detailed overview of a web-based platform for marketing and communication with exemplary data sources, media channels and media channel front ends, applications and functions. The application can be a hybrid or best-of-breed system, backend and output are designed as headless architecture. © Melaschuk-Medien

the advantages of an uncomplicated and speeded-up system setup are to be combined with the advantages of the more flexible system architecture of best-of-breed or headless concepts.

Alternatively, one works with a provider or system integrator that has its own or selected partner systems in its portfolio, which are usually connected on the basis of a framework. A framework is a programming framework that contains “pre-programmed” parts and specifies the structure in which the function modules and programs interact.

Advantages:

- Use of systems that are best specialized for individual tasks.
- Individual system components can be replaced more easily, independently of the entire system.
- A gradual, agile expansion of the system.

Challenges:

- The functionalities of the individual systems may overlap.
- Increased maintenance effort because the systems have different update cycles.
- Different user interfaces reduce user acceptance.
- Performance problems can arise due to data transfer via multiple interfaces or servers.

The main problem with best-of-breed systems can be the lack of interoperability of the individual system components (*Forrester 2021*). As a result, high expenditures and costs are incurred to ensure integration. Therefore, technology users should place a special focus on the quality of the frameworks and provider support.

Microservices

Microservices are functional units for smaller tasks that are connected via interfaces to form an entire system. Examples of microservices are price calculators, online editors, inventory management or search functions.

The objective is that a change, malfunction or failure of a single component should not lead to a significant impact on the overall system. Support for agile working methods, rapid adaptation to new requirements and the use of multiple development teams working in parallel are also seen as advantages.

Disadvantages are the high complexity of the overall system and an increased expense for maintenance and administration compared to integrated systems. Dependencies and interactions between components and data require central documentation, monitoring and careful testing.

2.2.2.2 Interfaces and API-first

The term “interface” basically covers various methods of connection between software solutions. These can be programmed connectors integrated in the applications or public specifications for interface development as well as import and export filters for defined data formats. Data can also be provided and retrieved via hot folders.

APIs (Application Programming Interface) are used to implement many interfaces. An API is a program part that is made available by a software system to other programs for connection to the system (*Wikipedia 2022b*).

Single sign-on (SSO) interfaces are often used as part of integration into the corporate intranet to enable only one-time password-protected login to the network by employees. This is intended to avoid employees having to identify themselves several times for different systems and services.

API-first

The principle of system architecture based on best-of-breed or microservices is also associated with the “API-first” concept, since the system structure is largely realized by means of APIs.

API-first means that a system is first designed with regard to its basic structure, components and dependencies, which is usually done down-

stream in integrated systems. Various methods and standards are used to develop APIs, such as REST (Representational State Transfer) or GraphQL (Graph Query Language). The most important communication protocol is HTTPS. Data formats and markup languages are used to transfer the content – usually XML, HTML, YAML (YAML Ain’t Markup Language) or JSON (JavaScript Object Notation).

The OpenAPI Initiative (OAI) is intended to advance the development of a vendor-neutral, standardized and open standard for interfaces (*Adobe 2021*). Within the OpenAPI initiative, “Swagger” is also managed as a technology for the important documentation of REST APIs. Documenting an API is important so that each development team can work on a consistent basis. Public API documentation also facilitates integration with partner systems.

API Management

API management systems are used to centrally manage a large number of interfaces. Access protection, connection to user administration with rights and role management, authentication and authorization, logging of accesses and monitoring for security-relevant processes are important functions (see Fig. 2.4).

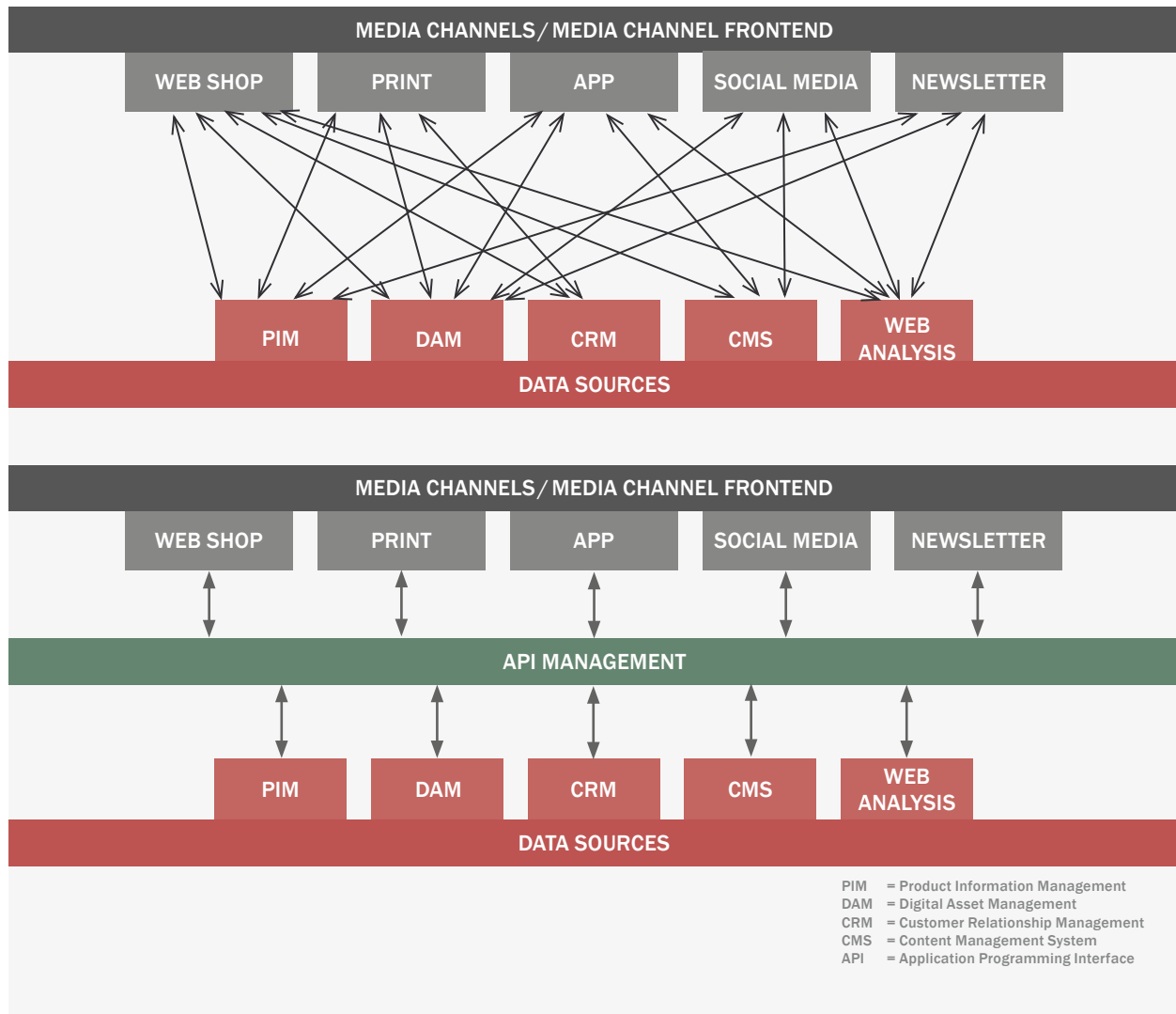


Abb. 2.4 System concepts without vs. with headless / API-first. Top: Connecting multiple data sources with media channels and media channel front-ends results in multiple connections that complicate management, maintenance, and replacement of individual components. Bottom: An API management layer for the API-first concept centralizes data with access protection and user management. The output channels can be connected to a central database and flexibly expanded. © Melaschuk-Medien

Standard connectors and cloud services

An alternative to individually configured APIs are standard connectors and plug-ins, which have a tight coupling between two systems with a defined range of functions, are regularly maintained, and are quickly ready to function. For example, there are standard connectors between a product database and a specific e-commerce system to provide items for a store in real time. A plug-in, on the other hand, is an additional program in an application program, also called an add-on, that establishes extended functions or data exchange with third-party systems. One example is access to images in a media database via a plug-in in the Adobe InDesign layout program.

Cloud services are programs from third-party providers that can supplement the company's own system landscape via API connection, such as AI-supported text creation, translation services, printing services (forwarding of print data to printers, such as Gelato) or automation platforms, such as Zapier.

Import and export functions

If the development of interfaces seems to be too costly or is not wanted, for example because a too close connection to a third-party system is not reasonable, the export and import of data can be a practicable and fast to implement solution. In contrast to interfaces, data is not updated “in real time”, but at defined times that

trigger automatic or manual data transfer, for example via “hot folders”. A prerequisite is an adaptation of the data structures based on a structure definition, such as an XML schema, if XML data is to be exchanged.

An example of data export is the transfer of electronic data records from a product database for the purpose of exporting them to catalogs, websites, web stores, electronic marketplaces or apps.

2.2.2.3 Headless system architecture

A continuation of the best-of-breed concept is the headless system architecture in conjunction with the API-first concept (Fig. 2.3). The headless concept is used when you want to control numerous output channels on a central data and function basis. Common core systems are CMS or e-commerce systems.

The headless principle involves separating the media channel frontend and backend, which are programmed by specialized development teams. The media channel front-end provides the user interface for users and accesses or writes back functions and data via interface communication with the back-end and the database. This makes it easier to add additional output channels and devices to systems that access core functions, data and business logic. The central functions are shown in the applications area (Fig. 2.3).

Data basis

The data basis includes databases or online analytics data and also data from platforms classified as output channels in Figure 2.3, such as usage data from social media platforms or app applications. This data enters the data basis in the form of usage data. The data basis also includes web CMSs or web stores if they are used as data sources. This approach is suitable if direct database access is not possible or specialized databases, such as PIM (product information management) or DAM (digital asset management), are not available.

Target group data management

The target group data management level works as a data hub: Data originates from a wide variety of data sources, which are brought together, enriched, correlated with each other, prepared according to the target group, personalized, and converted into the appropriate technical formats for the respective media channels. This is also where the contextualization of information takes place, i.e., the identification of relationships between information units.

An example of contextualization: customer master data from the customer database (CRM), article data (which the customer has ordered or is expected to order) from the product database or the web store, tracking data from a web analysis program, and order data from an enterprise resource planning system are linked

and prepared for the display of personalized web pages or the output of personalized print products, such as mailings or package inserts (“programmatic printing”).

Solutions such as customer data platforms (CDPs) are used for this technical level. The interaction with a data management platform (DMP) also enables the use of programmatic advertising. For this purpose, data on recipients and target groups is analyzed and processed for “one-to-many” addressing in compliance with data protection regulations.

Advantages of headless system architecture:

- Faster enhancement of systems to include distribution and output channels.
- Higher degree of implementation of corporate design guidelines.
- Quick adaptation of design changes.
- Innovative media channel front-end extensions easily implemented (such as chatbots, augmented or virtual reality).
- Consistent user experience through central data basis.
- Concentration of development resources on the reusable backend processes as well as frontend development.

Headless system architecture challenges:

- Media channel front ends may need to be developed first.
- Setup effort for the overall system is increased.
- Clear conception required for separation of presentation and functions.
- Functional gaps in the frontend can affect user experience (like content creation in live web pages).
- Security gaps when functions are built into the frontend.
- Performance issues due to data transfer across multiple interfaces or servers.

Digital Experience Platforms

The “digital experience platform” (DXP) category formed by U.S. market research companies Gartner and Forrester, such as those from Adobe or Sitecore, are also characterized by headless architectures and well-documented APIs. According to Gartner, this is “...a well-integrated and interconnected set of technologies that enables the assembly, management, delivery, and optimization of contextualized digital experiences for rich customer journeys.” (*Gartner 2021*). However, the functions and output channels in the DXP are focused on the digital domain, excluding the print sector.

2.2.3 Stand-alone systems integration

Over the past few years, many companies have installed system solutions in the areas of marketing and communications in order to meet certain requirements with a manageable amount of resources. These systems are, for example, promotional item shops, print shops, e-mail newsletter tools, POS TV systems, download centres or media and product databases (hereinafter referred to as “stand-alone systems”). Often there is no connection between these “isolated solutions”, for example for cross-system reporting, or users have to log-in into different portals several times in order to access the products and services.

In contrast to the best-of-breed approach, this is about grown structures in companies and not about a specific selection of solutions to form a platform.

There are now different methods to merge such a heterogeneous system landscape and to offer the users of IT portals an uniform environment as possible (Fig. 2.5). For example, two systems can be connected via interfaces, where one system provides the frontend like a shop system and the other system provides the backend, i.e. the ordering processes, order management and release procedures.

The basic approach for the following exemplary variants is to establish a central solution as a “control centre” and to integrate the individual solutions. This central platform can also cover an essential part of the desired functionalities, such as marketing planning, individualization of advertising media and ordering options. The central Single-Sign-On (SSO), i.e. the one-time registration of users for all systems, should be aimed at in any case.

Variant 1: Consolidation

During consolidation, the entire range and functionality of the previous stand-alone system is taken over by the central platform. The stand-alone system is then completely replaced. The partial, successive takeover, in which the stand-alone system can still be accessed via SSO linking for a transitional period, can also be useful.

Advantages:

- Standardization of user interfaces.
- Central offers within one system and standard processes.
- Central data management and reporting.
- Higher user acceptance.
- Cost reduction for ongoing operations.

Disadvantages:

- Complex migration of data and functions.
- Possible adaptation of the central platform to the functional scope of the stand-alone system and new development of functions.

Variant 2: Parallel operation

In parallel operation, both the central platform and the stand-alone system are used by the users with the full range of functions. An SSO link should support the orientation over the existing offer and the connection alternatively in both directions. Direct links (“deep links”) can be used to refer specifically to landing pages offering the stand-alone system.

If shop and logistics functions are available in the stand-alone system, these will continue to be used. An automatic “return link” from the stand-alone system to the central platform can take place after the order process has been completed in order to facilitate user guidance. Information about system activities, such as order data, can be transferred to the central platform to enable evaluations across the systems.

Advantages:

- Low resources required to connect the systems.
- Consolidation of reporting data enables transparent evaluations.

Disadvantages:

- Different user interfaces in the frontend.
- Different workflows and functions.
- Cross-system process optimization is difficult.
- Multiple efforts for system administration and system maintenance.

Variant 3: Frontend Integration

With front-end integration, the offer contents, such as product and article data, are integrated into the user interface of the central platform via an interface. Data can be mirrored and displayed within the user interface of the central platform. Alternatively, the integration is implemented via inline frame (iFrame) and the representation of partial areas of the stand-alone system is made possible within the central platform. The back-end processes, such as the ordering process and subsequent release processes, take place within the central platform.

Advantages:

- Standardization of user interfaces (for data mirroring).
- Central offers within one user interface.
- Central and standard processes.
- Central reporting.
- Higher user acceptance.
- Cost reduction for ongoing operation through process optimization.

Disadvantages:

- Complex interface development for data mirroring.
- Standard user interface in the frontend is not completely implemented (for inline frames).
- Possible adaptation of the functional scope of the central platform and new development of special functions of the stand-alone system.

Variant 4: Backend Integration

With backend integration, the frontend of the stand-alone system is used for navigation and selection of products or content. Backend processes are executed from the central platform. If an order is triggered in the stand-alone system, this order data is transferred to the central platform (“punch-out process”). All products are collected in the shopping basket of the central system. All subsequent ordering and back-end processes are continued in the central platform. This can include commercial processing, release procedures or other individual processes. This variant is also frequently implemented in large companies, which purchase from different suppliers, but which are to carry out central commercial order processing in Enterprise Resource Planning (ERP) systems.

Advantages:

- Central and standard commercial processes.
- Central reporting.
- Cost reduction for ongoing operation through process optimization.

Disadvantages:

- Different user interfaces in the frontend.
- Complex interface development.

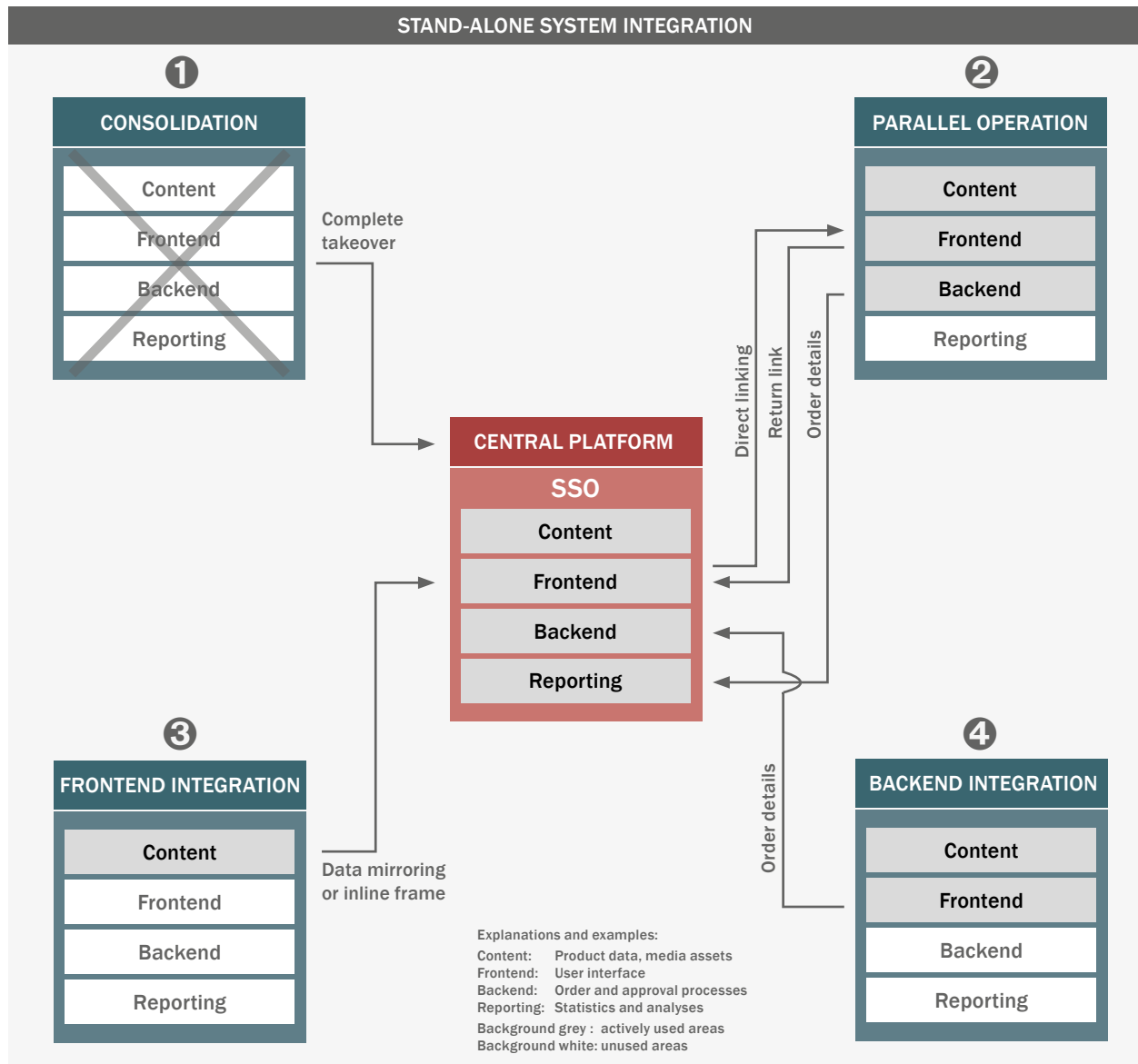


Fig. 2.5 System integration concepts. Four exemplary variants for integrating stand-alone systems into a central platform.
© Melaschuk-Medien

2.3 Cloud computing

The hosting of web-to-publish systems is carried out either by the system operators in their own data centers, in the customer's own data centers or by service providers in data centers that offer IT infrastructure as a service, also known as "cloud computing".

If the systems are only used by a defined group of users within a company, this is referred to as "private cloud". In contrast, services of a "public cloud" can be seen that are publicly accessible. These include the file hosting service Dropbox, Google Docs applications and various e-mail services. In hybrid applications, the applications of a public cloud are used, but data with higher security requirements is managed internally (*Fraunhofer 2022*).

Cloud computing increasingly in use

The main advantages of cloud computing are the relief of installation and maintenance tasks for IT departments, the automated adjustment of computing power when required (scaling) and the mobile and central, location-independent availability of software solutions or data.

Software offered as part of cloud computing is referred to as Software-as-a-Service (SaaS) (*Wikipedia 2021*). Around 82 percent of companies with 20 or more employees use cloud computing in 2021. This represents an increase

of six percentage points over the previous year. 42 percent of companies also use the public cloud for the majority of their critical applications and workflows and 29 percent partly for critical business information (*KPMG 2021*).

Cloud native software development

Cloud computing and "cloud-native" software development are closely linked to the system concepts around best-of-breed, microservices and API-first and will significantly determine future developments in IT. Microservices, individual tasks, are combined in mobile "containers" and loosely connected to each other via interfaces. Scaling, i.e., matching computing power to demand, can thus be done for individual microservices and does not have to be done for a large overall system.

Cloud-native applications are designed from the outset for operation in the cloud. The Cloud Native Computing Foundation (CNCF) definition is as follows:

"Cloud-native technologies empower organizations to build and run scalable applications in modern, dynamic environments such as public, private, and hybrid clouds. Containers, service meshes, microservices, immutable infrastructure, and declarative APIs exemplify this approach." (*CNCF 2022*)

Criteria and standards for the evaluation of data centres

When evaluating IT infrastructure services, the following criteria can be considered among others, which are contractually agreed within the scope of so-called “Service Level Agreements”.

- Hotline with high availability and defined response times.
- Regular import of system updates and security patches.
- Scalability.
- Monitoring at short intervals.
- Monitoring of accessibility and system utilization.
- Hardware monitoring (temperature).
- High availability and short-term elimination of system malfunctions.
- Use of a firewall on special servers.
- Integration of additional company-owned firewall solutions.
- Data security during operation (Raid hard disk systems).
- Daily data backup (full and incremental backups).
- Data backup in separate data centers.
- Integration of company-owned data backup and archiving solutions.
- Fire protection measures.

Data protection and data security in the focus

Certifications and demonstrable orientation to standards are important for establishing trust in the infrastructure. After all, the biggest concerns about using cloud computing are in the areas of security and compliance. 75 percent of companies are concerned about unauthorized access to company data. Other factors of uncertainty lie in the legal situation and lack of cost transparency. *(KPMG 2021)*

2.4 Project management

In the area of project management, the processes and procedures for system selection and development are considered. So-called classical and agile methods are compared and the sensible use is clarified.

2.4.1 Procedure for selecting a system

System selection is one of the components of IT projects whose relevance is generally accepted, but is to be increasingly reduced to a minimum. In this context, clients often refer to agile methods.

If the system is to be selected by applying agile methods, it is necessary to take a closer look at which project steps can be carried out agilely in the sense of “stepwise” and “compressed”. In principle, agile methods make sense in order to be able to react more flexibly to changing framework conditions and technological developments in the overall project. In this way, a limitation to basic requirements during the conception phase is also possible.

However, conceptual work remains necessary, which is also an important basis for later system development or must be carried out at the latest within the scope of project implementation. This includes, for example, the preparation of a project description. In addition, requirements

– even if they are presented in compressed form – must always be validated, i.e. checked, in cooperation with the system providers.

The basic procedure for selecting a system is divided into the following sections:

- Clarification of requirements
- Market research
- Provider evaluation

2.4.1.1 Clarification of requirements

At the beginning of the project a team has to be formed, which consists of employees in the company and possibly external employees. The objectives, requirements and procedures for the planned system are clarified in workshops. The basis for the requirements clarification can be the application scenarios and elements from the marketing and communication ecosystem.

A project description can be derived from the results, which can also be used as a tender document.

It should be noted that the level of detail should only be increased step by step by structuring the requirements first roughly and then more finely. This level of detail is also an important criterion for deciding whether to proceed according to the agile or classic method (Tab. 2.1).

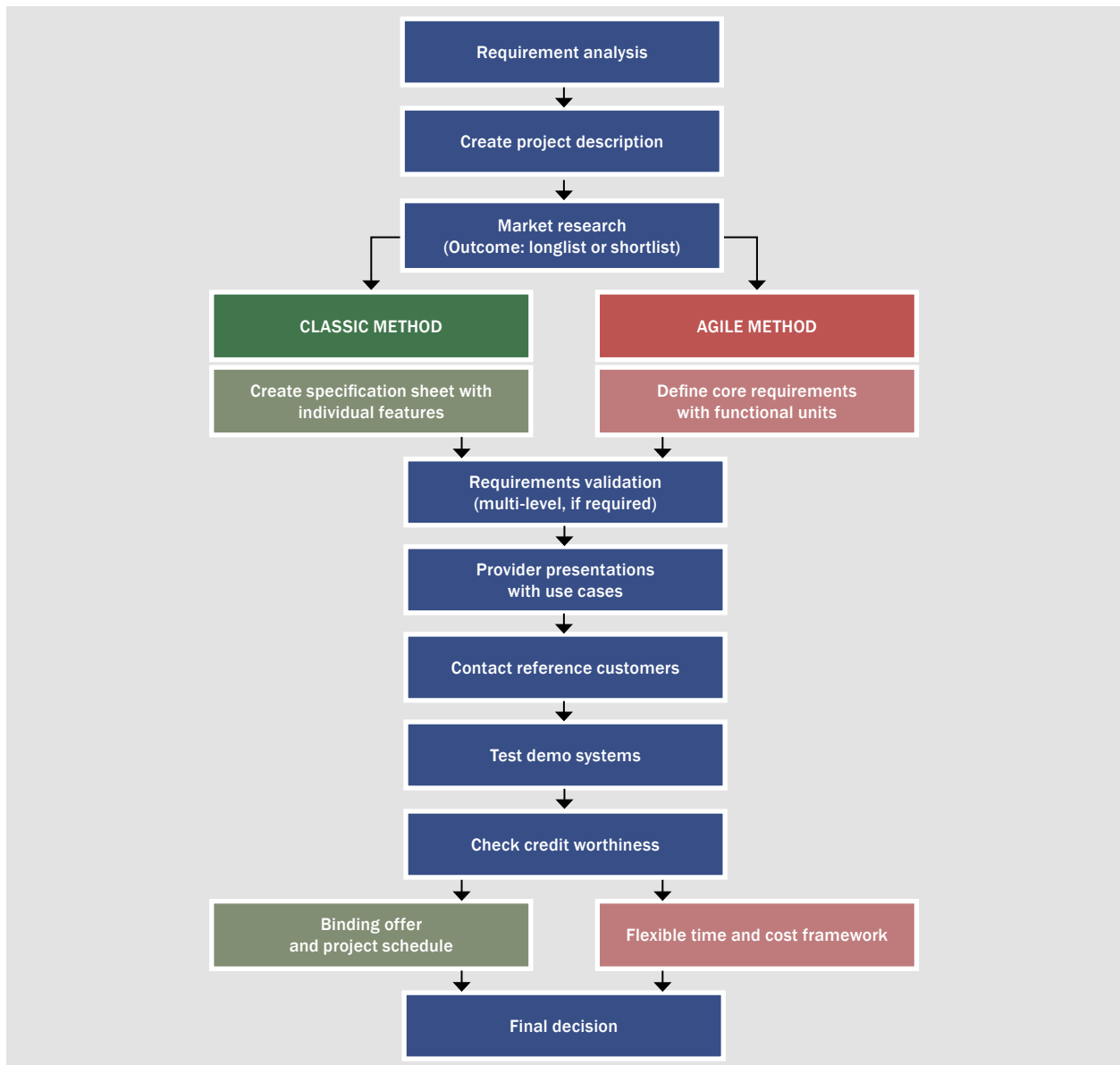


Fig. 2.6 Procedure of a system selection including classical and agile methods. © Melaschuk-Medien

Classical method

With the classical method, a detailed requirement specification sheet (explanation see “Info-box”) is drawn up in which the requirements are presented as comprehensively as possible and formulated precisely in relation to individual functions. The prerequisite for the application of the classical method is that the requirements can be determined to a large extent completely and do not change substantially in the process of project setup. Costs and efforts should be estimated as accurately as possible.

Agile method

With the agile method, the requirements are defined in the form of a minimum scope and on

the basis of important “core requirements” and described in a more general form than with the classical method. A disadvantage of the agile method can therefore be that certain detailed functions have not been clarified and must be implemented in the process of the project as individual customizations. On the basis of agile methods, costs and expenses can be determined less accurately than with the classical method, but can be secured by cost limits.

Classical and agile approaches can also be combined, for example by choosing the classical method for certain system modules and the agile approach for others.

Classical system selection	Agile system selection
Comprehensive, detailed requirement description in a requirement specification sheet.	More general description of core requirements.
Requirements definition (specifications) and requirements validation are relatively time-consuming.	Requirements definition (core requirements) and requirements validation are less time-consuming.
Binding estimate of costs and expenses.	Definition of flexible cost and time frames, which are only concretized in the process of the project within individual implementation steps.
Clarification as to whether detailed functions are individual customization takes place in advance.	Detailed functions that were not clarified within the context of the core requirements must be implemented later, if necessary, as individual adaptations.

Tab. 2.1 Comparison of classic and agile system selection. © Melaschuk-Medien

2.4.1.2 Market research

Based on the clarification of requirements, relevant providers are selected through market research and possibly the use of external specialists. The result of the market research is a list of providers which, depending on its scope, is referred to as a “longlist” or “shortlist”. As a rule, a shortlist is first derived from the provider evaluation (see following point) and then usually comprises two to three providers who are analyzed in more detail or invited to provider presentations. In individual cases, if clear exclusion criteria are available and the market is transparent enough for the decision-makers, a shortlist can also result from the market research.

When including service providers who subject systems and suppliers to a project-independent preliminary evaluation and promise a “quick” shortlist creation, it should be noted that often only a part of potentially relevant suppliers is represented, the market analysis may be incomplete and the information may be outdated. Since the market and software solutions are constantly evolving, in most cases all requirements must be project-specific, checked in real time and validated.

INFOBOX

LONGLIST

The longlist is an initial list of potentially relevant providers created as part of a system selection. The scope depends on the number of providers in the market segment, the requirements and market knowledge of the longlist producers.

SHORTLIST

The shortlist is a list of providers created as part of a system selection, which usually represents a selection of the providers on the longlist. The shortlist providers fulfil essential criteria and are subjected to further detailed checks.

REQUIREMENT SPECIFICATION SHEET

Within the scope of classical system selection procedures, a requirement specification sheet is a structured compilation of supplier- and system-independent requirement criteria which the customer creates.

PERFORMANCE SPECIFICATION

A performance specification is drawn up by a selected provider. In conjunction with a binding offer, it contains the provider-specific services that are to meet the requirements. The specifications can be drawn up on the basis of the requirement specifications.

2.4.1.3 Provider evaluation

The requirements are processed by the longlist providers and the answers and responses are evaluated. In many cases, it makes sense to carry out the requirements clarification in several steps. The suitability of the providers of the longlist is hereby checked with a relatively small number of requirements, possibly exclusion criteria. Relevant providers for the shortlist are derived from the result. Objectively measurable evaluation methods, such as a value-of-use analysis, should be used within the scope of provider evaluation.

Important for the provider evaluation are also provider presentations in which providers should realize so-called “Use Cases” in order to be able to evaluate the practical efficiency of the solutions comparably.

Other instruments include contacting reference customers, test or demo systems and credit checks. In all these measures, comparability should be ensured by appropriate specifications.

The requirements are then further concretized in a workshop with a final selected provider. The provider-specific project implementation is developed within the scope of the classical method as the basis for a performance specification (explanation see “Infobox”) and a binding offer. If the agile method is used, requirement descrip-

tions and a cost framework are designed. Project schedules must be presented for both methods.

This is followed by contract negotiations and step-by-step project implementation, which will be described by Roland Bühler in the following chapter.

2.4.2 Classic or agile: Methods in IT development

BY ROLAND BÜHLER

IT projects bring with them typical challenges, which in many cases are not part of the actual software development, but rather to the area of project management.

2.4.2.1 Challenges in IT development projects

In this context, it is first important to consider the characteristics of a project in general. Among other things, projects are characterized by the fact that – in contrast to processes – they are limited in time, unique, and involve changes. This often leads to uncertainties. Another special feature of projects is the fact that people, departments or areas often (have to) work together here that have no or only few points of contact in day-to-day business.

Particularly in IT development projects, uncertainties often relate to the exact recording and consideration of requirements, which are often still unclear at the beginning of the project. Although requirements can be determined and clarified in advance through analysis and discussions with all stakeholders, this is usually a theoretical process, since there is no practical experience with the new software solution and the associated processes.

Another challenge in requirements management can be the fact that possibly conflicting requirements from different departments or areas have to be taken into account.

2.4.2.2 Waterfall model vs. agile procedure models

First, two fundamentally different procedure models are considered:

- Classical procedure models (waterfall model)
- Agile procedure models

Classic procedure models (waterfall model)

In the waterfall model, individual phases are processed sequentially in a linear process. Each phase has a defined start and end point as well as a defined result. The use of a waterfall model therefore requires very precise planning; responding to changes in the ongoing project is often only possible with additional planning effort. Requirements are usually specified in a specification sheet. Usable results (such as software) are often only available at the end of the project when the waterfall method is used, but then (ideally) in full and with consideration of all planned aspects.



Fig.. 2.7 Classical procedure model (waterfall model). © Roland Bühler

Agile procedure models

It often turns out (especially in the field of software development) that it is difficult to plan all aspects in advance, so that changes almost always arise during the ongoing project. In addition, the testing and use of the developed systems often results in further points to be considered, which cannot be predicted “on the green table”. Therefore, agile procedure models proactively address the topic of “change” and do not see this as a disadvantage, but rather as an opportunity to successfully design a project based on “real” experience.

Requirements are often maintained in a dynamic “product backlog” in the agile approach. This is a “stack” of individual requirements, some of which are only determined or refined during the ongoing project – based on initial practical experience. In this context, one also speaks of “backlog items”, which describe the individual requirements.

In addition, agile development involves working in iterations, i.e. step-by-step repetitions (called

“sprints” in Scrum). In each sprint, a part of the product backlog is implemented. At the end of each precisely timed sprint, a “piece of software” is available that represents a potential release and can be used in real life or under real conditions. This in turn generates feedback from users that can be taken into account in further iterations. In this way, better and more complete software is created step by step.

The challenge when using agile process models is often the fact that all those involved have to get involved in agility. This also applies to the client, who must recognize as an advantage that it is not known in advance exactly how the software will develop in the course of the project.

2.4.2.3 Scrum

Scrum is probably the most prominent agile procedure model. This chapter is intended to give a first overview of Scrum, but of course cannot cover all aspects completely.

The Scrum Team

Scrum provides clear roles and responsibilities. These are briefly described below.

Product Owner

Product Owners are responsible for the characteristics and thus for the (economic) success of the software to be developed. A Scrum team has one Product Owner. Product Owners specify and prioritize requirements – and thus fill the so-called “Product Backlog”, the list of requirements to be implemented. Product owners are the interface between the developers and the stakeholders in the project. The latter can be, for example, customers, colleagues, employees – or users in general.

Developers

Developers are responsible for implementing the requirements specified by the product owner. In doing so, they take care of all relevant activities: from software architecture to programming to internal testing of the software, all within a sprint.

Scrum Master

The impression can arise that Scrum Masters are a kind of “project manager”. However, this is not correct, because Scrum is based on very flat hierarchies. Rather, Scrum Masters are responsible for ensuring that the use of Scrum as a process model is successful. She or he helps to comply with the Scrum rules and to remove disruptions in the use of Scrum. A Scrum team has one Scrum Master.

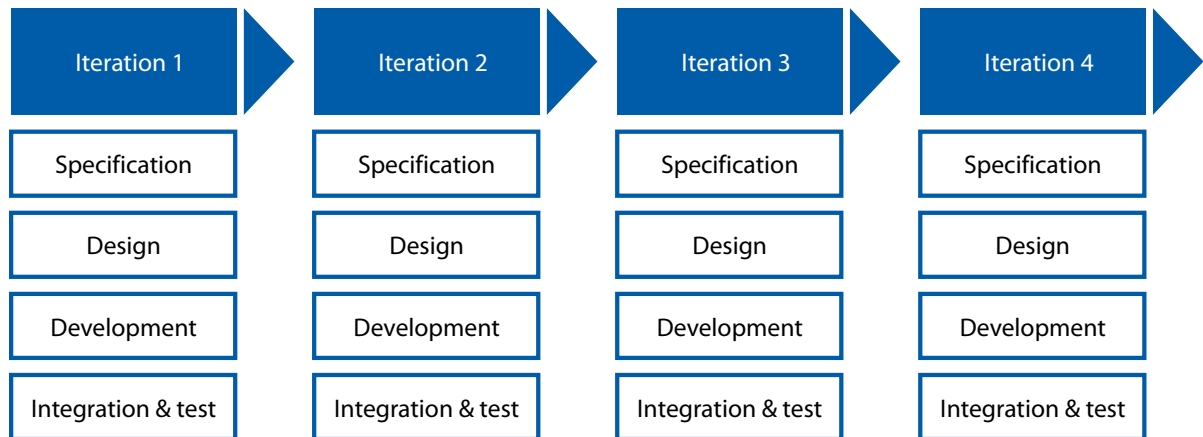


Fig. 2.8 Agile procedure model. © Roland Bühler

Sprints and meetings in Scrum

Sprints

Sprints are fixed periods of time in which an iteration is delivered – for example, additional features are added to a piece of software. The objective of a sprint is, as mentioned in the previous chapter, to “create a releasable piece of software” with which users can subsequently gain experience. In Scrum, a sprint can be a maximum of one month long, but should always have the same duration within a project. For example, a project could be estimated with 10 sprints of two weeks each.

Sprint Planning Meeting

Here, the members of the Scrum team discuss which entries of the product backlog will be processed in the upcoming sprint. The individual topics to be worked on are also discussed in detail and divided into fine-grained “tasks” so that the development team can start working. The entries to be worked on from the Product Backlog are then transferred to the Sprint Backlog for the respective Sprint.

Daily Scrum

The developers meet in a daily 15-minute meeting. At this meeting, each member reports on what they have achieved since the last Daily Scrum, what they intend to reach by the next Daily Scrum, and whether there are any current obstacles or problems. Scrum Master, Product

Owner or Stakeholders can be present at this meeting.

Sprint Review Meeting

Here the results of a Sprint are presented and it is checked whether the objectives set for the Sprint have been achieved. It is important that stakeholders, for example customers or users, actively participate in the Sprint Review, so that feedback can be obtained in order to achieve improvements in subsequent Sprints.

Sprint Retrospective

Sprint Retrospective is an internal meeting of the Scrum Team at the end of a Sprint to discuss feedback and achieve continuous improvement of the way of working. Here, for example, it can be discussed what to do if the sprint goals are regularly not achieved.

2.4.2.4 PRINCE2 Agile

PRINCE2 (PRojects IN a Controlled Environment) is a scalable and adaptable project management method that follows the “best practice” idea. PRINCE2 provides for different phases for a project, which include all hierarchies from the preparation to the completion of the project, from the management level to the project management and the executive level. This also includes aspects that are not explicitly covered in Scrum. PRINCE2 focuses on the following basic principles:

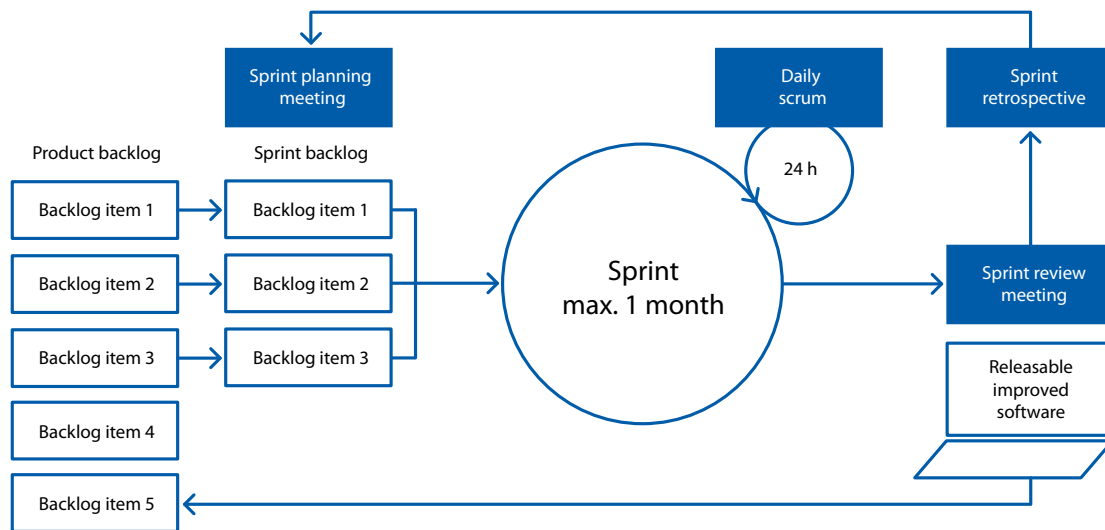


Fig. 2.9 Procedures when using Scrum. © Roland Bühler

- Ongoing business justification – based on a business case.
- Learning from experience – in the project and from previous projects.
- Defined roles and responsibilities – which are defined by PRINCE2.
- Controlling through management phases – which are linked to objectives that are reviewed when moving to the next phase.
- Controlling according to the exception principle – so that project tolerances (e.g. costs) that are exceeded are consciously controlled.
- Product orientation – so that the result of the project is in the foreground.
- Adapting to the project – as each project or organization is individual.

PRINCE2 provides for different phases of a project, the design and scope of which can be adapted very strongly to the respective project requirements.

The idea behind PRINCE2 Agile is to combine the comprehensive project management framework of PRINCE2 with agile approaches, for example based on Scrum. For example, an overall project can be managed in several phases using PRINCE2. Within a phase, the actual software development is then mapped agilely on the basis of Scrum within several sprints.

2.4.2.5 Kanban

If the control of “Work in Progress” and the optimization of lead times are in the foreground, Kanban can be a very effective and efficient methodology in software development. Kanban recognizes the following basic principles:

- Start with what you are currently doing.
- Agree that evolutionary change is followed.
- Respect initially existing processes, roles and responsibilities.
- Encourage leadership at every level of the organization.

In addition, core practices play a central role in Kanban, among other things to visualize the flow of work. Physical or digital Kanban boards are used for this purpose. In columns, individual steps are shown, which correspond to the

flow of work. The individual tasks (e.g. backlog items, similar to Scrum) are first arranged in the first column (e.g. in the form of a sticky note on a physical board). Then the items are moved from column to column (depending on progress and available capacity). This makes it easy to adhere to other core principles of Kanban, such as limiting work in progress and measuring and controlling the progress of work.

Kanban is not agile, but is not necessarily in conflict with other agile methods and frameworks. On the contrary, blends such as “Scrumban” combine elements of both frameworks.

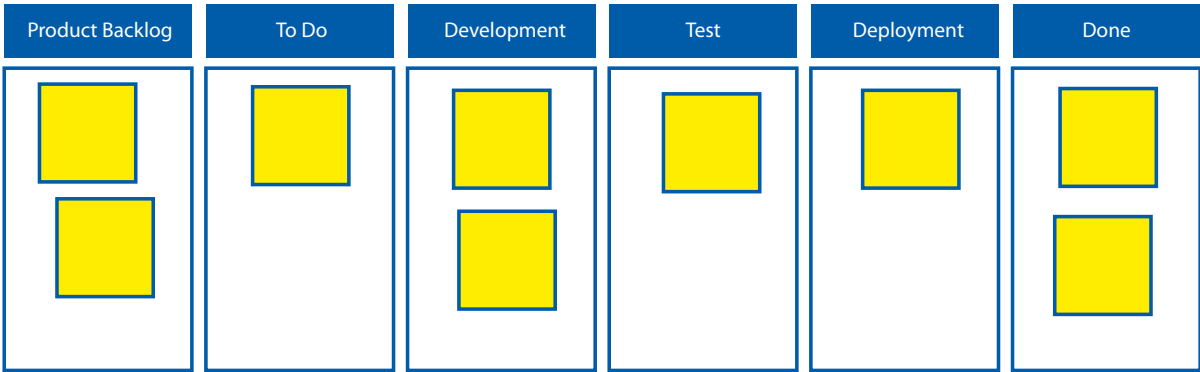


Fig. 2.10 Example of a Kanban board in software development. © Roland Bühler

DevOps

Traditionally, the focus of IT projects is often on the actual development of the software. After completion and acceptance, IT operation is then no longer part of the project, but takes place downstream in the regular business process. However, as soon as software is developed in an agile manner, development and operation of a software run in parallel. Productively used systems are supposed to benefit from agilely developed increments – and are therefore subject to regular change. This is a conflict per se and associated with risks.

This is where DevOps (a made-up word consisting of the terms “development” and “operations”) comes in, by providing a collection of different technical methods to allow IT development and IT operations to cooperate in the best possible way.

In particular, DevOps is therefore also applied to best-of-breed or API-first projects, which are characterized by step-by-step development.

In addition, DevOps also deals with cultural aspects to optimize this very cooperation. It goes without saying that DevOps and Scrum are best friends.

2.4.2.6 Suitability and limitations of agile procedure models

In this context, it should first be mentioned that agile methods can be easy to understand in theory, but challenging to implement in practice.

After all, successful projects do not depend primarily on school book-like application of the Scrum Guide, for example. Rather, trusting collaboration and project culture are at least as important for successful agile projects.

With regard to purchasing processes and contracts, it should be mentioned that in an agile approach, no trade can be defined in advance, because it is not yet known at the time of the order what exactly will be delivered.

Many clients find it difficult to get involved in this situation, especially since it also raises legal issues.

But here, too, there are now “best practices” in the form of contractual solutions that take into account aspects of agile software development in a balanced manner for both client and contractor.

Ultimately, the chosen method must match the project and the company. How much agility is possible and makes sense depends on various factors, such as flexibility in product delivery, simplicity in communication (for example, between participating departments), but above all on the “mindset”, i.e., the attitude of the people involved. In addition, the question arises as to whether Continuous Integration or Delivery plays a role for the respective project – and thus DevOps comes into play.

References:

The Scrum Guide™, Ken Schwaber and Jeff Sutherland, 2020: <https://www.scrumguides.org/>

AXELOS Website mit Informationen zu PRINCE2: <https://www.axelos.com/resource-hub/prince2/>

ROLAND BÜHLER

Roland Bühler founded rb omnichannel GmbH in 2017 – after leading positions at agencies and system service providers.

He has experience in managing complex projects. Activities for analyst firms round off his profile.



RB OMNICHANNEL GMBH

The company rb omnichannel specializes in consulting and project management in the field of marketing technology and supports all phases of a project: from the business case to the implementation of new processes and technologies.

Depending on the type of project, rb omnichannel acts as consultant, project manager or product owner.

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3 ECOSYSTEM MARKETING AND COMMUNICATION

SUMMARY

The “Ecosystem Marketing and Communication” includes a method that provides a comprehensive and field-proven basis for requirements analysis or performance description. Both companies seeking software solutions and system providers can benefit from it. The content required for this is described in this chapter and can be used as a guide.

A definition of requirements by technology users is subsequently the starting point for deriving suitable deployment concepts in the context of system selection or system development.

The term “ecosystem” is used here in analogy to the term in biology and refers to various participants and components that are related to each other and are characterized by dynamic change processes. The relationships are established through integration and a common network platform.

The ecosystem is intended to provide a holistic view focused on the IT infrastructure for marketing and communication requirements.

The Marketing and Communication ecosystem provides methods for classifying and matching the requirements of technology users and solutions from technology providers and for obtaining a basis for system selection and system development.

Technology users, such as enterprises, media service providers, or publishers, can clarify strategy and requirements based on the Marketing and Communications ecosystem. The ecosystem helps to classify the large number of software solutions and functional diversity.

Technology providers, on the other hand, can use the ecosystem to innovatively develop their own solutions in the complex application landscape, position themselves clearly in the market, and market themselves.

The ecosystem provides a concrete selection of typical application scenarios and the essential elements of marketing and communication solutions.

By matching requirements and solution offerings, the ecosystem provides the basis for successful and efficient system selection or system development in further steps, for example on the basis of an agile best-of-breed approach.

3.1 Practical use

The following describes the practical process for a system selection or system development based on the ecosystem for marketing and communication.

Requirement clarification

Technology users clarify their general area of application as well as strategy and needs, for example in a workshop. Technology providers, such as software vendors, system integrators or external consultants, can provide support. The elements of the ecosystem for technology users – user groups, functions, database, media channels, and integration needs – are customized and concretized.

The result is a visualized representation of the strategy and requirements in the form of a “big picture”. In addition, a structured representation of the ecosystem elements can be derived, for example in an Excel file. See chapter “Sequence of a system selection”.

System selection

If a system selection is to be made in the next step, a market research is also carried out, for example with the help of the market overview Web-to-Publish by Melaschuk-Medien.

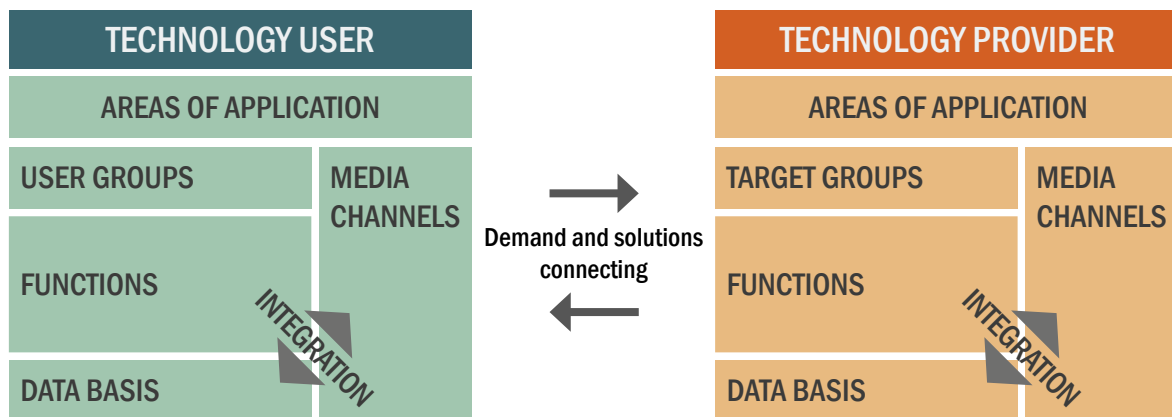


Fig. 3.1 The marketing and communications ecosystem at a glance. The needs of technology users are connected with the solutions of technology providers through matching. © Melaschuk-Medien

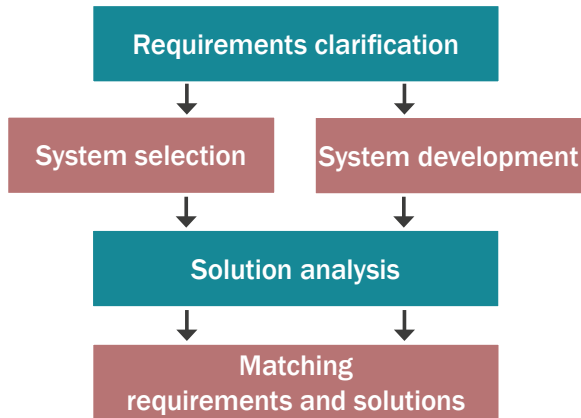


Fig. 3.2 Process flow with the marketing and communication ecosystem at a glance. © Melaschuk-Medien

Link: www.melaschuk-medien.de/en/market-overviews-web-to-publish-crossmedia.html.

The requirements from the ecosystem, as a whole or for subareas, are further specified and compared and evaluated with the scope of services of several technology providers.

The technology providers' scope of services can also be presented based on the ecosystem.

Other possible project steps include provider presentations, setting up test systems, or reference customer surveys.

System development

If suitable systems or components are already available, classic or agile system development can follow. Within the ecosystem, the areas for which the project scope is to apply are then named. The requirements are specified further and the targeted solution is developed step by step – using integrated software solutions or best-of-breed components.

3.2 Areas of application

The areas of use are defined as part of the requirements clarification or system analysis and are divided into marketing, e-commerce, collaboration and communication. These are typical practical scenarios. Thus, requirements or solutions are first classified in the first step. Several usage scenarios can be relevant at the same time.

3.2.1 Focus marketing

The “Marketing” area includes web-based solutions aimed at successfully positioning a company in the market. In the case of advertising material and marketing service portals, the focus is on the standardization of advertising materials, while personalization is the primary objective of marketing automation systems and automation is more likely to be the primary objective of multichannel production.

Web content management systems, on the other hand, address web presences as a central marketing building block.

Brand portal

In a brand portal, corporate design guidelines, logos, media files and templates are made available for retrieval by internal and external employees and partners of a brand company. The aim is to create a uniform brand image both internally and externally.

Advertising media portals

Corporate advertising material portals are offered for a closed circle of users. There is a range of printed and digital promotional materials, as well as business stationery and promotional items that can be customized. The portal is provided by companies with a decentralized organizational and sales structure for branches, subsidiaries, dealers or franchisees. But centrally organized companies with a large number of advertising materials also use web-based advertising material portals. Web-to-print is the term used for the web-based transmission or creation of printed materials.

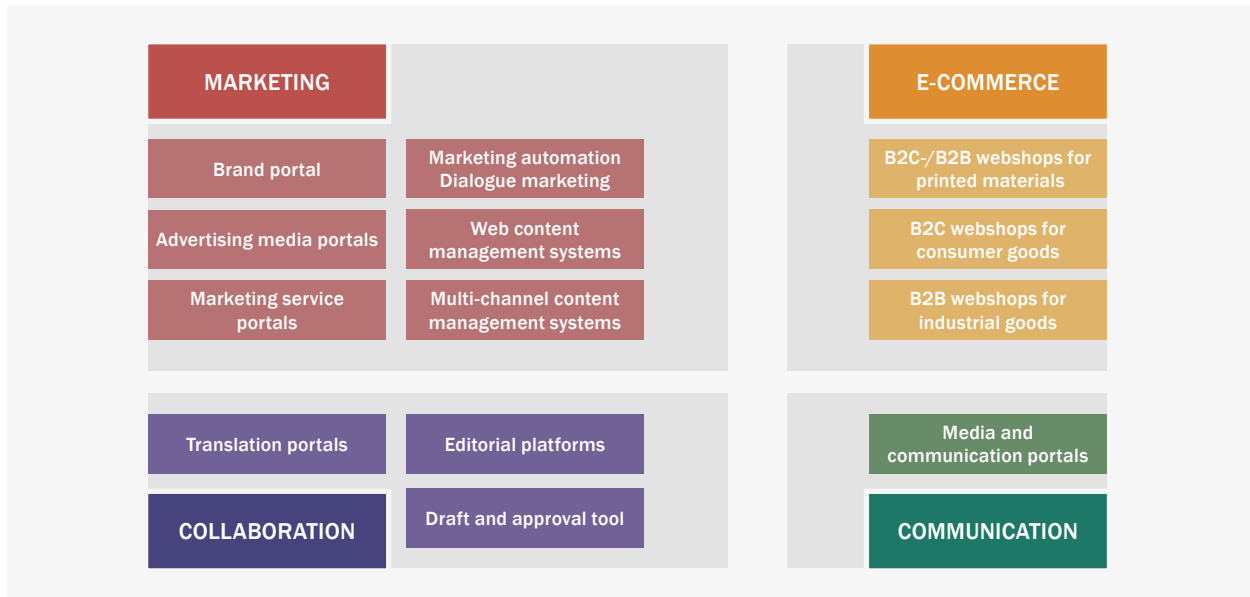


Fig. 3.3 The application scenarios of web-to-publish systems can be divided into the main areas of marketing, e-commerce, and collaboration and communication. © Melaschuk-Medien

Marketing service portals

Marketing service portals are provided by industrial companies, associations or publishers for a closed user group that includes their own economically independent business customers, for example, craft businesses, retailers, doctors or booksellers. The offering includes printed or digital marketing materials that can be individualized.

Marketing Automation, Dialogue marketing

In marketing automation systems, which also include dialogue marketing systems, (personalized) marketing campaigns are implemented with several media channels active in parallel and networked with each other. Typical combinations are print mailings, e-mail newsletters and landing pages with forms, for example for registrations or competitions.

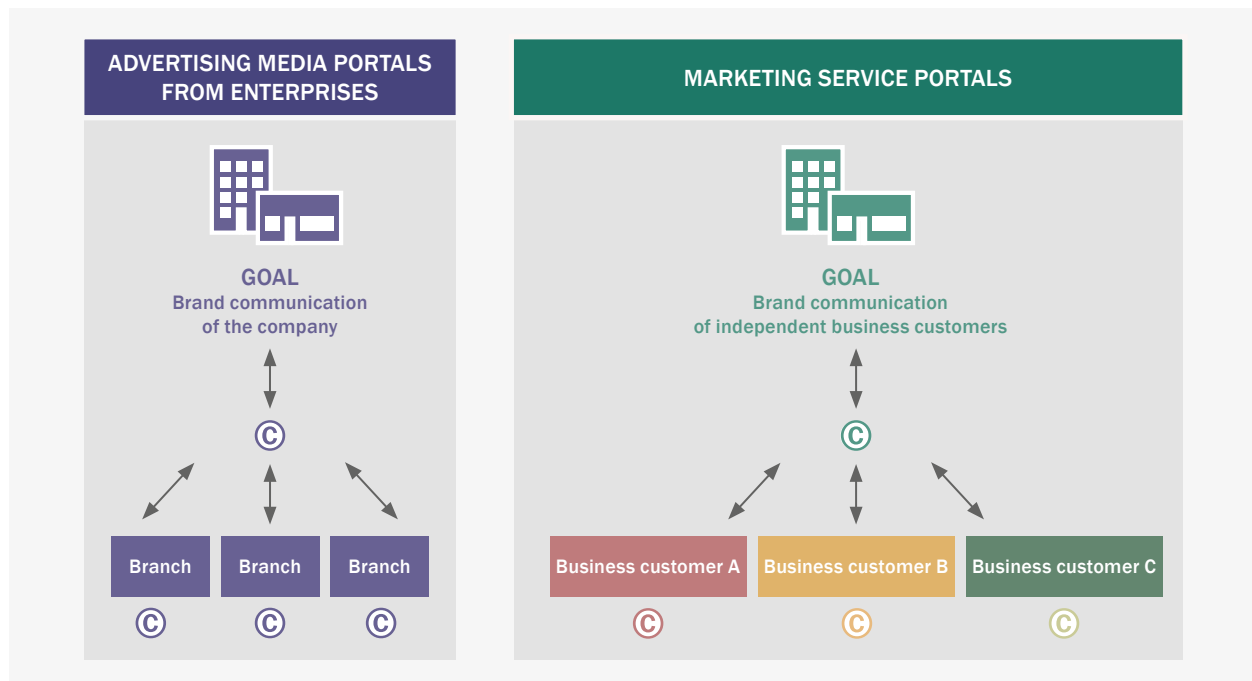
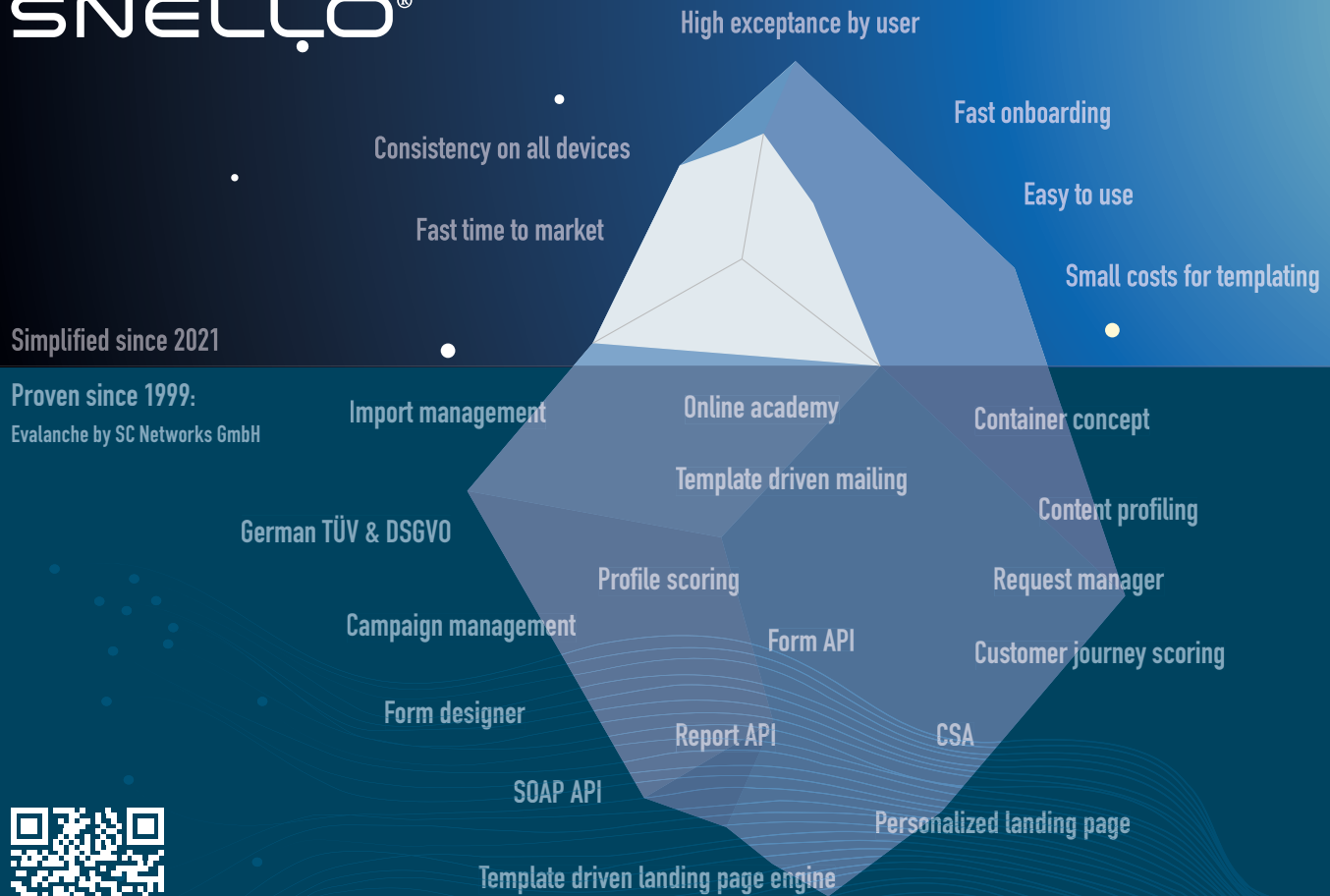


Fig. 3.4 Left: Companies' advertising material portals pursue the goal of their own brand communication. Right: Marketing service portals aim to strengthen the competitiveness of their own customers. © Melaschuk-Medien

SNELLO®



SNELLO is the world's first easy-to-use and wizard-driven e-mail marketing solution for decentralised teams, dealers and partners based on premium technology Evalanche in a headless approach. The consistent division into the separate functional levels of editing and sending, template creation and corporate design definition makes it possible for the first time to offer cd-compliant mailing templates for decentralised use in distributed organisational structures. Localised areas of application so far are: KAM Support, Sales Operations, Employer Branding, Lead Management, Knowhow transfer, Content sharing etc. Due to the open architecture, further integration topics such as CRM, ERP, PIM, BI etc. are our current roadmap. [Join us on this journey. https://e-raumwerk.de/snello/](https://e-raumwerk.de/snello/)

PUBLISHERS PUBLISHING	CORPORATE PUBLISHING	TECHNICAL DOCUMENTATION	WEB CONTENT MANAGEMENT
Newspapers Periodicals	Employee and customer magazines	Internal and external documents of technical documentation	Websites
Books	Business reports		
	Product brochures		
	Product catalogs		

Fig. 3.5 The publication areas in the focus on collaboration can be divided into publishing, corporate publishing, technical documentation and web content management. © Melaschuk-Medien

The media channels supported generally include e-mail, print, websites, social media, and apps. The processes are mainly automated workflow- and action-driven, from which the term marketing automation is derived.

Web Content Management Systems

The main task of web content management systems (web CMS) is to create websites for the “public” domain, i.e. for open user groups. The content management is database-based and can be used for the output to further media channels.

Multichannel content management systems

Multichannel content management systems (CMS) are used for database-driven, (automated)

content delivery to print and digital media channels. Analogously used terms are headless CMS or digital experience platforms.

3.2.2 Focus e-commerce

The e-commerce sector covers internet-based platforms for purchasing and ordering transactions. A distinction can be made between public web stores (open shops) and closed portals for business customers (B2B (business-to-business)) closed shops and B2C (business-to-consumer) stores. Closed shops are only accessible to defined user groups, often within a company intranet.

B2C / B2B webshops for printed products

Webshops for B2C (business-to-consumer) and B2B (business-to-business) products are “public” online stores run by printing companies offering printed advertising materials and business stationery as well as promotional items.

B2C consumer goods webshops

Webshops for consumer goods, such as furniture, clothing or cars, belong to the “public” online stores of consumer goods manufacturers for end consumers (B2C, business-to-consumer), whose products can be individually configured using variable parameters.

B2B webshops for industrial goods

Webshops for industrial products, such as machines or tools, are operated by industrial companies for direct business customers or dealers in the B2B (business-to-business) sector. Offered are industrial products, spare parts, services for repair, maintenance or rental, application training or product-related documentation, such as operating instructions and manuals.

3.2.3 Focus collaboration

Collaboration solutions are systems that support the cooperation of several participants. The object of collaboration is central documents that are created, edited and commented on collaboratively.

Translation portals

Translation portals are platforms with special functions for the translation of multilingual publications, on which master documents are provided as a basis as well as language versions derived from them. The language versions can be called up, translated and adapted by translators or employees of country subsidiaries from any location. An important feature is layout control during translation.

Editorial platforms

Editorial platforms are used for the collaborative editing of content and documents for the output of print and digital publications. Classic products from the field of publishing and corporate publishing include journals, newspapers, books, magazines and catalogs, as well as manuals and technical documentation (Fig. 3.5).

Draft and approval tool

A draft and approval tool is used to create and collaboratively approve final documents or drafts, for example, for design templates and websites. The process of approval can be performed using comments, chat functions, and task lists, or via direct editing in the application. Versioning and change tracking can increase transparency for project teams.

3.2.4 Focus Communication

The “Communication” area is about portals that essentially realize the purpose of providing data and information. Profiles for user rights can be used to additionally control access options and authorizations.

Media and communication portals

Media and communication portals are platforms in which media objects such as images, texts, video and audio files or documents are made available for central coordination, information, research, conversion and distribution. Corporate news, corporate design documents and other internal resources can also be accessed on the portal.

3.3 Elements

After clarifying the areas of use, the elements of the ecosystem are assembled: User groups (technology users), target groups (technology providers), functions, data basis, media channels and integrations.

3.3.1 User groups (technology users)

Technology users combine individual system users into groups in the user groups, which are differentiated from each other by rights and role assignments.

Internal:

Internal user groups include users who work within the company, such as marketing, sales, IT, or branch employees.

External:

External user groups include users who do not work in the company, such as agency employees, suppliers, translators, independent dealers, or journalists.

3.3.2 Target groups (technology providers)

Technology providers address target groups that are operators and licensees of marketing and communications solutions, such as companies, media service providers, or publishers.

3.3.3 Functions

Communication

Examples for the functional area communication:

- Centrally controlled or collaborative exchange of information by participants, for example using chat function or commenting.
- Workflow-controlled processing of documents and data for the development and coordination of drafts in creation or the implementation of marketing campaigns.
- Configurable digital assistants to optimize and automate user interfaces.

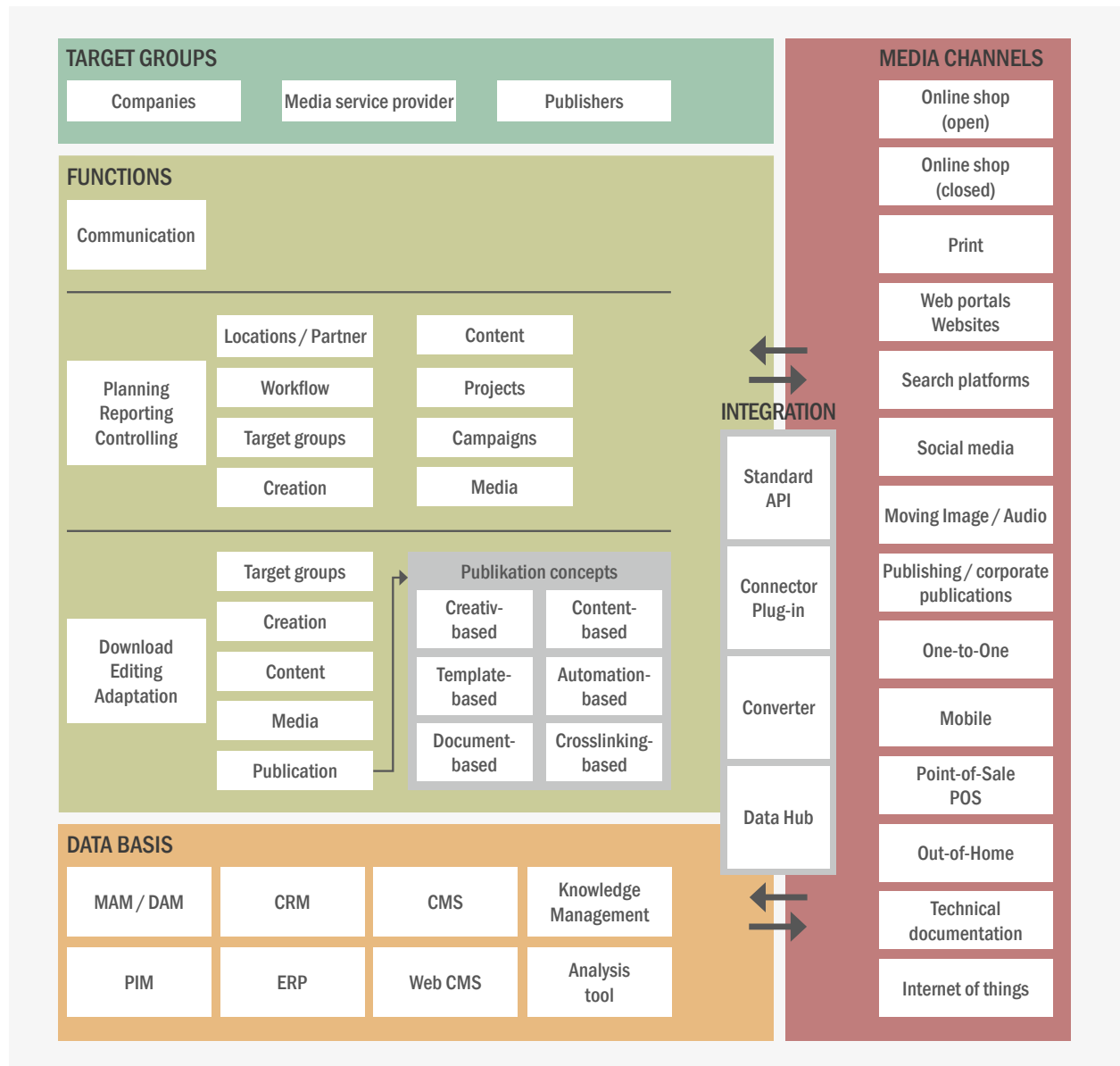


Fig. 3.6 The elements within the ecosystem marketing and communication for technology users. © Melaschuk-Medien

Planning, reporting, controlling

In the area of planning and controlling, contents, processes, participants and framework conditions are defined, continuously monitored, controlled and adjusted with regard to time, costs and other performance parameters. The following sub-areas are differentiated, with examples:

1 Locations/Partners:

Marketing planning for stores, activity analysis of sales partners, management of advertising allowances for partners.

2 Workflow:

Configuration and automation of workflows for creation, production, approval.

3 Target groups:

Structuring of recipient groups or interest profiles, target group adjustment as a result of real-time evaluation of e-mail newsletters.

4 Creation:

Workflow control for creation of drafts.

5 Content:

Page planning for publications, planning the creation of editorial articles, social media posts or photo shooting, compilation of merchandise assortments.

6 Projects:

Workflow control including approvals and production parameter maintenance for ad, poster production, workflow control for product brochure translation, workflow control for trade show event execution, reporting for Facebook ad.

7 Campaigns:

Topic-related compilation of marketing measures, campaigns.

8 Media:

Media planning, real-time tracking of online ads, keyword definition for Google Ads, definition of geographical environment data for media booking.

Download, editing, adaptation

In the area of download and adaptation, content, parameters, publications and metadata are designed, edited, compiled, finalized or accessed. The following subareas are differentiated, with examples:

1 Target groups:

Edit recipient data, select interest profiles for an ad campaign on Facebook.

2 Creation:

Designing drafts.

3 Content:

Capture/adapt (create copy or social media content, image data editing, store item and product data maintenance).

Retrieval (downloading corporate design or sales materials).

4 Media:

Select publishing properties for ad booking, select out-of-home locations for billboard booking, book and play Facebook ads.

5 Publication:

Downloading finished documents, creating printed and digital publications. A further classification is given below under “Publication concepts”.

6 Publication concepts:

The publication concept describes the procedure and technical functions of publication creation, including by means of editors or external systems. The procedures can also be combined in one system.

6.1 Creative-based

The creative-based publication concept enables creative layout work with functions for creating, formatting and positioning objects in an editor.

6.2 Template-based

The template-based publishing concept uses standardized templates (print and digital) that contain both unchangeable and changeable (customizable) layout objects.

6.3 Document-based

In the document-based publishing concept, a single central document is created, edited, finalized, or commented on collaboratively by users.

6.4 Automation-based

For the automation-based publishing concept, design elements in templates or structuring specifications (such as XML) are linked with fields from structured data sources (such as databases, Excel) or content from external programs in a conceptual phase. During subsequent production, the content flows into the template manually, partially or fully automatically.

6.5 Content-based

Two process variants can be differentiated in the content-based publishing concept.

Variant 1:

Content modules consisting of single or multiple elements are created, edited or commented on by users decentrally (in external systems) or centrally. These elements are brought together centrally and form the basis for media-specific output to various communication channels, for example by automatically linking content to

layout templates or exporting electronic data records.

Variant 2:

Various layout, or content elements are centrally captured, formatted, and provided by authorized employees and assembled into a publication by users.

6.6 Crosslinking-based

In the crosslinking-based publishing concept, templates are created for two or more media channels (such as print or emailings, social media, websites) and linked together. For example, links to landing pages can be integrated into mailings or social media posts.

3.3.4 Data basis

The data basis includes specialized database management systems, such as product and media databases, as well as analysis tools for data or knowledge management.

MAM/DAM

Media asset management (MAM) and digital asset management (DAM) databases are used synonymously to refer to media management databases.

PIM

Product information management (PIM) databases are used to create and maintain product

information that is essentially used for marketing and sales in a company.

CRM

Customer Relationship Management (CRM) is the collection and analysis of customer data for the purpose of strengthening and expanding customer relationships or increasing demand for specific customer groups.

ERP

ERP stands for Enterprise Resource Planning. ERP systems cover business tasks such as the management, planning and controlling of business processes, including order and procurement processing, purchasing, finance, human resources and operating resources.

CMS

Content management systems (CMS) enable the management and editing of content, such as texts, documents or media objects, for example images, video and audio files.

Web CMS

Web Content Management Systems (Web CMS) enable the management and editing of content, such as texts, documents or media objects, for example, images, video and audio files for output to web systems and web platforms.

Knowledge management

In a knowledge database, information and documents for a specific specialist area are compiled collaboratively by registered users. It is used, for example, in customer service or sales.

Analysis tool

In analysis tools (synonyms: business intelligence, reporting tool), analysis data is summarized, visualized and used as a basis for decision-making. Among other things, analysis data includes information on user behavior and the technical conditions for the use of online services, such as internet portals or web shops.

3.3.5 Media channels

Media channels are either fully or partially created with internal system functions, or content and advertising material portals are output to external media channels.

Examples of media channel creation using internal system functions:

- Web page creation by a CMS.
- Layout creation and PDF output for a print catalog.
- Configuration of an advertising material B2B webshop.

Online shop (open)

Open online stores are publicly accessible web stores for the B2B and B2C sectors. In principle, the user groups are open, which means that there are no exclusion criteria for users. This also includes online marketplaces as marketing and shopping platforms on the Internet.

Online shop (closed)

Closed online shops are web stores for closed user groups in the B2B sector. This also includes online marketplaces as marketing and store platforms on the Internet.

Print

Print includes printed matter of all kinds, such as advertising material portals and business stationery, mailings, newspapers, books, catalogs, packaging, large formats or printed merchandise, such as promotional items (T-shirts, mugs, pens and others).

Web portals, websites

Web pages include the World Wide Web (WWW) in general, web portals or individual web pages, such as landing pages. Web pages are created internally in the system, or content is output to web pages by means of interfaces. This also includes online ads that are played out on the WWW.

Search platforms

Search platforms are portals with search functions for information, products or services.

Profiles, content, comments or advertisements are published. Examples include search engines, price comparison portals, recommendation portals and business directories.

Social media

Social media includes portals of social networks, such as Facebook, Twitter or YouTube. Profiles, content (posts, pages), comments or advertisements can be published in the social media portals.

Moving image, audio

Moving image and audio can include single video or audio files, TV, cinema, radio, up to digital signage solutions (POS TV) played out at locations of digital advertising spaces.

Publishing, corporate publications

Publishing and corporate publications are printed or digitally published periodical editions of newspapers, journals, magazines or product brochures and catalogs.

One-to-One

One-to-one includes dialogue marketing systems, such as digital or print newsletters (mailings), direct mail, and digital assistants in customer communications (chatbots). It also includes the

personalized display of digital media channels, such as websites.

Mobile

Mobile includes mobile applications such as apps, e-books, e-papers, or the playout of ads in mobile platforms and apps.

Point-of-sale (POS)

Point-of-sales (POS) are sales locations, such as retail stores, trade fair booths, sales rooms or workshops. The equipment of a POS includes furnishings, window dressing, signs, telephone announcements or WLAN hotspots. Special advertising material portals such as shop window displays, flags (see “Print”) or digital signage solutions (see “Moving image, audio”) are also included.

Out-of-Home

Out-of-home includes digital or printed advertising measures in outdoor areas or public places, such as streets, supermarkets or airports, as well as vehicle lettering.

Technical documentation

Technical documentation includes, for example, manuals, operating instructions or knowledge databases.

Internet of things

Internet of things refers to internet-enabled objects that can measure and analyze conditions

and trigger actions. Information or advertising content is shown on displays.

3.3.6 Integration

Standard API

An application programming interface (API) enables software providers to connect third-party systems to their own systems.

Connector, plug-in

A connector is a tool specialized in connecting defined systems, enabling data transfer and configuring functions for integration. A connector can be a standalone program or a plug-in, also called an add-on. A plug-in is an additional tool for a specific application program, extends its functionality or is used to exchange data with partner systems. An example is the integration of data from a media database into the layout program Adobe InDesign.

Converter

Connection with external systems or data exchange can be realized with converters, which enable the conversion of data for import or export. Examples are the import of Excel data with address data for mailings or the export of electronic data sets, such as BMEcat, for online marketplaces.

Data Hub

In the data hub, data from various internal or external data sources is brought together via standard interfaces, prepared for further use, made available or exported. This also includes so-called target group management or customer data platforms, which, for example, collect data from CRM, PIM, MAM systems and web or social media activities, profile it and make it available in media channels for real-time personalization.

4 DATA MANAGEMENT

SUMMARY

This chapter first introduces artificial intelligence as the most important “engine” for future developments and applications in the field of marketing and communication.

In addition, the diverse types of data sources as the basis for all variants of media production are explained and their use in the context of media-neutral data management and publishing from a single data source (“single-source publishing”) is clarified.

The various methods for identifying target group data and managing them are of particular importance. Current developments are mainly determined by the discussion about “cookies”.

In further articles, the practical implementation of various aspects is examined in more detail: on the one hand, the methodology of analyzing data and its use in advertising campaigns and, on the other hand, colour management, which is responsible for uniform colour reproduction in different output channels.

4.1 Trends and Artificial Intelligence

In the field of data management, the constantly growing amount of data, which accumulates at an ever-increasing speed, must be made controllable and usable. Central, well-maintained data sources are becoming increasingly important in order to be able to manage growing data stocks, reduce multiple efforts when controlling several communication channels and use automation options. In addition to structured data from databases, unstructured data such as social media texts, images or videos are increasingly being added.

Ways to make databases more accessible are technologies, such as NoSQL and semantics and the integration of different data sources in API and target group management layers.

Above all, however, progress in the field of Artificial Intelligence (AI) plays a key role, which will be examined below for its effects on marketing and communication. The term AI implies that by means of artificial systems human intelligence with the ability to abstract thinking, to analyze complex contexts and to find solutions should be emulated.

The preliminary stage of AI systems includes solutions that are rule-based (Fig. 4.1) or knowledge-based. An example of rule-based systems are cross-media dialog marketing systems (mar-

keting automation) in which campaign processes are controlled on the basis of event-driven workflows. This includes, for example, sending reminder e-mails after a certain period of time if recipients have not reacted.

Machine Learning and Deep Learning

AI in the narrower sense includes systems which, on the basis of so-called “machine learning”, are able to output results and recommendations for action on the basis of a sufficient amount of training data, to evaluate them and to correct future processes, i.e. to “learn” as it were. “Deep learning” is a form of machine learning that functions by means of artificial neural networks and a large number of layers. In particular, it

can be used to solve tasks for which there is a small case-related knowledge base, such as text, image or face recognition. Overall, however, there are hardly any limits to the range of applications for AI.

Data Mining

In data mining, data is made commercially usable through AI and machine learning by analyzing and evaluating it. Afterwards, concrete actions can be derived from forecasts. An example is the analysis of the buying behaviour of customers in an online shop and the subsequent display of products in a newsletter that are likely to meet with interest and are more likely to be purchased.

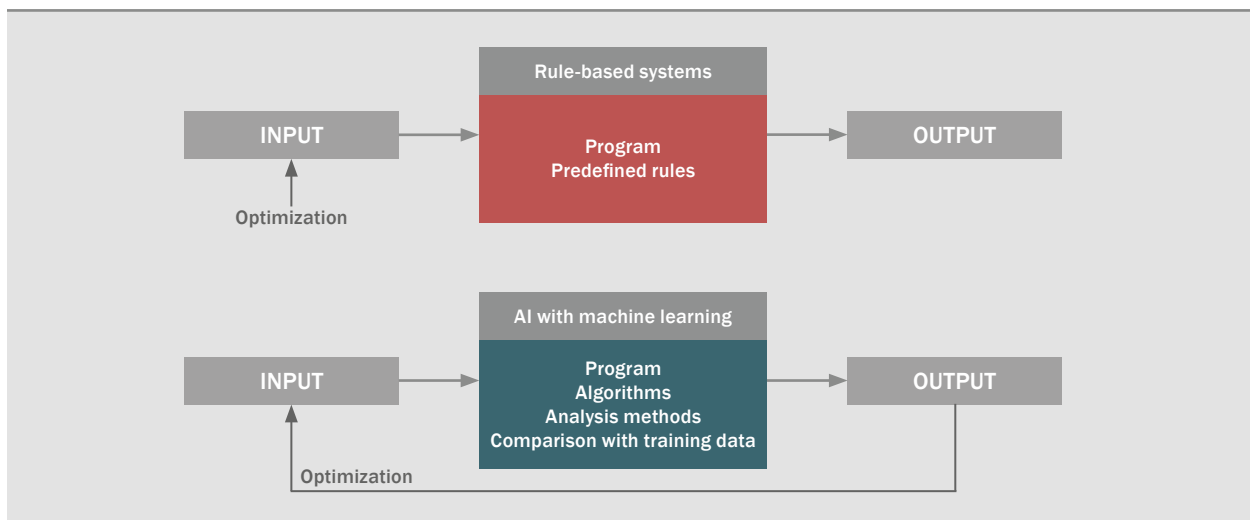


Fig. 4.1 Differences between rule-based systems and AI solutions based on machine learning.

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Natural Language Processing

Natural Language Processing (NLP) is the processing of spoken or written content. At Springer Verlag, NLP was used to create a fully automated chemistry reference book for which more than 150 research articles were selected, thematically arranged and summarized (*Springer 2019*).

In e-commerce, there is also referred to as “conversational commerce” when it comes to generating purchases directly from customer interaction. Language assistants play a central role here. In customer communication, it is chatbots that are used. In cases where the machine assistant does not know where to go, the forwarding to service staff should be either automatic or as required.

Compared to human intelligence, the limits of AI currently lie in the inclusion of experience and the correct classification of objects into a context. One of the most important prerequisites for the successful use of AI is the quality and quantity of the fundamental data.

AI capabilities are increasingly being used as a natural functional complement in a wide variety of marketing, communications, and e-commerce applications.

Further applications of Artificial Intelligence in practical use:

Product databases

- Automatic sorting of product data with a short description into predefined categories.
- Automatic creation of product descriptions based on structured information.

Media databases

- Image recognition of motifs and automatic creation of metadata.
- Automated generation of complex image masking and target resolutions.

Media production

- Generation of image motifs, for example model variants in fashion web stores.
- Image optimization, such as tone and color value corrections.
- Remove or add picture elements, automatic layout generation.

Text creation

- Create machine-generated texts for sports and financial news or scientific books.
- Create product text variants for different target groups, for example for use in web stores.
- Automatically generated translations in the form of initial translations.
- Creation of publishing products based on subject-related data source analysis.

Employee and customer communication

- Conversion of text files into videos in which avatars speak the texts.
- Advising website visitors on the supply of information or products via chatbot.
- Assistance with online contracts on websites.
- Support of customer service staff in the development of solutions together with customers.
- Generation of personalized newsletter advertising for new book publications of a media online shop on the basis of automated target group and product selection.
- Analysis and optimization recommendations for ongoing digital marketing campaigns with regard to advertising media used, target group parameters or budget planning.
- Recommendation system in marketing portals for users who are not marketing experts to select suitable advertising measures depending on the objective.
- Display advertising spots based on analysis of appropriate moving image content, such as mood or weather.
- Analysis of content on online platforms in order to display suitable online advertising (“contextual targeting”).

E-commerce and websites

- Display personalized content to website visitors based on online usage behavior.
- Dynamic price determination based on real-time data, such as weather, time of day or holidays, usage behavior, customer or machine data.
- Image recognition of any motifs taken by the user and display of similar products in the online shop.
- Complete purchasing process through communication with language assistants.

Marketing:

- Analysis of comprehensive market data, such as product evaluations on the internet and internal commercial data, such as sales figures or complaints. The goal is to achieve better customer understanding and optimized product development.

4.2 Data sources

Different data sources are evaluated for the requirements in marketing and communication – either individually or combined. The results are used and optimized for future activities and publications. In marketing campaigns, user activity results can flow back into the respective data sources in order to update or supplement them.

4.2.1 Classification of data source

The data sources are differentiated into zero party, first party, second party or third party data depending on the type of source.

Zero-, First Party Data:

This data is collected by companies themselves, for example in their own customer databases (CRM systems), or through collection via web forms, a newsletter service, or purchases in a web store. Zero-party data is actively and voluntarily shared by individuals, such as in surveys or participation in discount promotions. This type of data is subject to the greatest possible control with regard to quality, data security and data protection.

Second Party Data:

The data is purchased or used under license from a company that has collected the data itself as first-party data. Through the purchase, this data becomes “second party data” for the com-

pany. One example is data shared on platforms, such as “Data Clean Rooms”.

Third Party Data:

This data is acquired by professional data service providers who specialize in collecting and merging data from a wide variety of sources. For second- and third-party data it is particularly important to clarify aspects of data quality, copyrights, data protection and data security in a comprehensible way.

A major challenge for marketing and sales is to merge the relevant customer and prospect data with other data sources, to contextualize it, and to target the appropriate media channels on this basis.

In the following, common data sources are categorized (Fig. 4.2) and which data can be derived from them are described.

4.2.2 Internal databases and systems

More and more information from the entire value chain is stored digitally in internal company databases and systems. The advantage of central data management is that all parties involved have access to the same version of data and there is no need for time-consuming searches. This frees up resources for strategic tasks. Moreover, thanks to web-based, central access, employees in an international context

are not only independent of time zones, but also independent of persons who have sole access to data inventories.

Further advantages are the use of uniform terminologies and the avoidance of error sources through the multiple maintenance of data. The more media channels and language versions a company creates, the greater the benefits if updates and corrections only have to be changed once centrally and not manually in all derived variants and media channels.

Images, texts, documents, video and audio files including additional information, the so-called metadata, are centrally managed in a media asset management (MAM) database and used for use in various media channels. An equally used term is digital asset management (DAM). Metadata enables the execution of search routines, the flexible reuse of data and the control of application areas, for example the expiration of image rights.

Product Information Management (PIM) databases enable the finely structured management of product and article data. Media databases are often linked or integrated with this, for example to assign images to articles.

A customer relationship management (CRM) database is used to manage prospective and

customer data that is available for all corporate activities, including sales and marketing.

Web analysis data can also be included. The visitor behaviour in web pages is recorded and evaluated, for example, which web pages and parts thereof were visited and which links were clicked on.

In web stores, customer data, information on shopping and campaign behavior, and user activities are recorded, evaluated, and used for marketing campaigns. So-called recommendation engines are integrated into online stores and analyze buyer and user behavior. The results can be used to determine which products buyers are interested in and which products are likely to be of interest in the future. But product data managed in web stores can also serve directly as a data source if upstream PIM or MAM databases are not available.

Customer service data and knowledge bases contain structured collections of information about customers, products and processes that can be used for marketing, sales, service and development.

4.2.3 Online platforms and media channels

Online platforms are touchpoints in the form of media channels such as websites, web shops, apps or social media channels. Log-in data and

usage data can be collected to determine target group and reach data in this area.

Usage data for media channels, including television and radio, is also generally collected by companies, associations and organisations to determine reach. The instruments vary depending on the medium and range from interviews to

measurements or the collection of digital usage data.

Usage data includes click behaviour on websites, in an app, interest profiles from surveys based on web forms or actions in a web shop.

Within the planning process, it is also defined which user actions are to be measured to

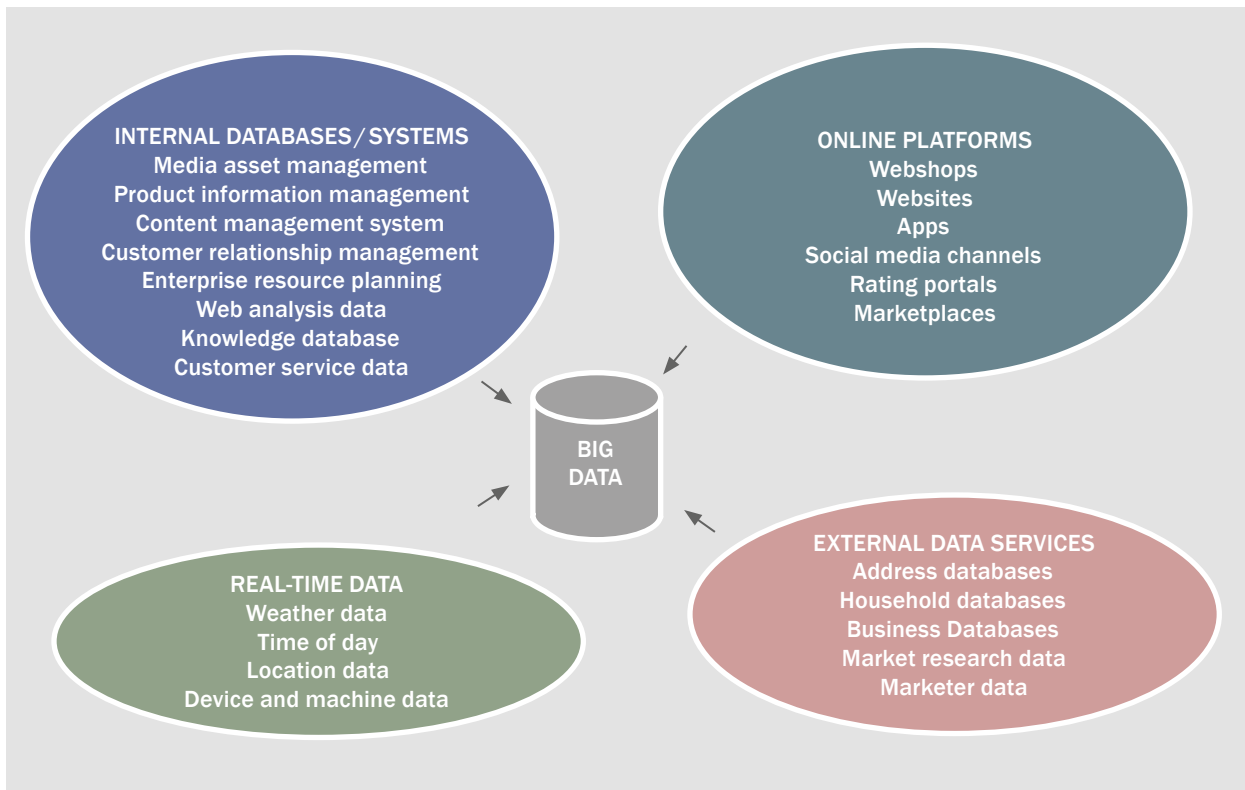


Fig. 4.2 "Big data" refers to data collections from various data sources that are evaluated and made available for economic purposes. © Melaschuk-Medien

monitor success. The measured data are so-called Key Performance Indicators (KPI). The measured data is recorded in real time and thus enables direct control and influencing of a campaign process.

Examples of KPIs:

- Newsletter subscription/unsubscription
- Clicks on links to PDF files
- Clicks on online versions
- Clicks on social share links
- Web form calls
- Website views
- Canceled shopping baskets
- Turnover of purchase actions

Data resulting from user interactions on online platforms also belong to real-time data in a narrower sense.

4.2.4 Real-time data

Real-time data is usually acquired via radio and sensor recognition. Real-time data, which are mostly context-related, such as weather, time of day, location, log or sensor data (of machines or devices), enable content to be played back according to requirements in a specific situation.

The positioning of users and consumers takes place in the area of WLAN networks, using GPS, mobile radio cells, Bluetooth or beacons as well as IP addresses. In the outdoor area (“out-

of-home”), the positioning can take place in or around a shop or on posters. By coupling with apps, location and time-related advertising can then be played out to the consumer, for example when a customer is in the vicinity during the opening hours of a store. For the optical recognition of passers-by, cameras or sensors are also attached to digital advertising surfaces that identify the age or gender of people and play out suitable advertising.

The device and machine data include the device type, manufacturer, operating system or display resolution. In the context of the “Internet of Things”, this data is becoming increasingly important for marketing, sales and service.

4.2.5 External data services

Data from external sources are either freely accessible to the public or purchased. Addresses and company information can be purchased from external service providers and used for marketing campaigns. In addition to addresses, household databases also provide information on the interests and preferences of the target groups. Research institutions regularly collect data on media channels, products and target groups, such as agma (Arbeitsgemeinschaft Media-Analyse e. V.) or GfK (Growth from Knowledge).

4.3 Target groups data management

In the future, the demands on media production will be to output data to output channels in a way that is appropriate to the target group and the situation. The Gabler Wirtschaftslexikon defines the term target group as “addressees; totality of all effective or potential persons who are to be addressed by a specific marketing activity. The basis for finding target groups according to relevant characteristics is market segmentation; the main problem is temporal instability (dynamics). To avoid distribution losses, only the media specific to the target group are selected in media planning.” (*Gabler 2022a*).

Target group data management can follow two different strategies: on the one hand, the direct addressing of individuals and, on the other hand, the formation of groups of people characterized by certain characteristics and behaviors, also referred to as “lookalikes”. The formation of target groups can, but does not have to, result from derivation from personal data. Statistical methods are used to determine characteristics (attributes), segments, clusters and so-called “personas”, which are typical representatives of a target group.

This target group data is linked to other data sources as part of the contextualization process. One example is the connection of web store

customer data with product data purchased by this target group.

4.3.1 Merging data silos

Accessing a specific database, such as a customer database or a web service, by means of an interface is state of the art and does not pose a fundamental problem. In this way, the data sources relevant to the company can be included for target group data management. Rather, it is a challenge to bring together this data from the different departments in the company, the so-called “data silos”. These can include the following:

- ERP data (master data, order data)
- CRM data (master data, customer history, sales information about customers)
- Email newsletter evaluation data (open rates, clicks, coupon redemptions)
- Social media activities (comments, likes, followers)
- Web store activities (purchases, abandoned carts, watch lists, interests)
- Website activities (clicks, interests, time spent, content data)
- Customer service (call center, contact forms, sales contacts)
- Customer loyalty program data (master data, purchase history)

On a technical platform, these data silos can be connected with other data sources (also with anonymous data, such as mobile IDs) by means of interfaces (Application Programming Interface, API). The next steps involve target group segmentation, merging of the data, and activation, i.e., the transfer to media channels.

The activities of individual persons in an advertising campaign across several touch points or media channels must also be able to be merged again and abstracted to target groups. This requires a data cycle from the data basis to the measurement of actions and success in the channels.

A particular problem is the collection of user data in the online sector, which is to be the basis for media planning and the output of advertising. Data protection regulations that are increasingly regulating the Internet, the associated need for user consent, and the limited use of cookies mean that conventional methods of data collection have to be modified or replaced.

4.3.2 The “cookie problem”

Cookies are one of the most important instruments for recording movements on the browser-based internet. When a website is accessed, a small text file, the cookie, is stored on the user's PC. This file can contain various data, such as the date and time of access or other information,

such as shopping cart contents. This data can be transmitted to third-party servers, such as ad servers, or websites can in turn read these cookies and thus track what activities the user has performed.

Cookies can also be stored only temporarily on a user's computer, as is the case with so-called temporary “session ID” cookies. These cookies are deleted after a certain daily period of time or when the browser is closed. Session cookies are data protection compliant under certain conditions. These include, among others: no profiling, no merging with websites of other providers or no data transfer to the USA.

However, major device and browser manufacturers, such as Apple and Firefox, already block third-party cookies. Google plans to phase out this technology in 2023, so alternatives are needed to ensure addressability and measurability of digital advertising.

4.3.3 Methods of online data detection

The following methods and initiatives, among others, are currently being discussed in order to detect usage data in the online sector or to implement advertising activities with the lowest possible scatter losses:

- First-party data
- Geo targeting
- Online mega platforms
- Log-in alliances
- Contextual targeting
- Advertising ID solutions
- Target groups data aggregation
- Server-to-server
- AI-based predictions

First-party data

First-party data (including zero-party data) is collected directly from the company and is considered to be the silver bullet in the advertising industry. This includes e-mail addresses for a newsletter registration or registration and log-in data in a web shop. Zero data belongs to first-party data and is given freely by the customer and prospective customer, as in the case of participation in a loyalty program. In the course of providing data, consent is also defined for the use of personal data for advertising purposes. Obtaining this consent will be an important objective for advertising companies in the future. One strategy for obtaining wide-ranging consent

to use data is to allow users to flexibly set the usage variants. Customer loyalty programs are also important means of obtaining customer data.

The objective is to get as comprehensive a picture of customers or prospects as possible and to merge data if it exists in several places in the company, for example in customer data or target group data management platforms.

An increase in the efficiency of advertising measures can be achieved above all by linking first-party data with the solutions described below in order to be able to infer generalized target groups from personal data, and vice versa.

Geotargeting

Real-time information about users' geographic location can be obtained via IP data, device IDs, or mobile apps. However, the reliability of this data is limited by changing IP addresses and privacy regulations.

Target group information that is independent of these limitations is provided by data service providers that link geographic data with target group information, such as purchasing power in specific residential areas. Effective online and offline advertising measures can be derived from this.

In the field of digital outdoor advertising, the marketer Ströer and Deutsche Telekom are collabo-

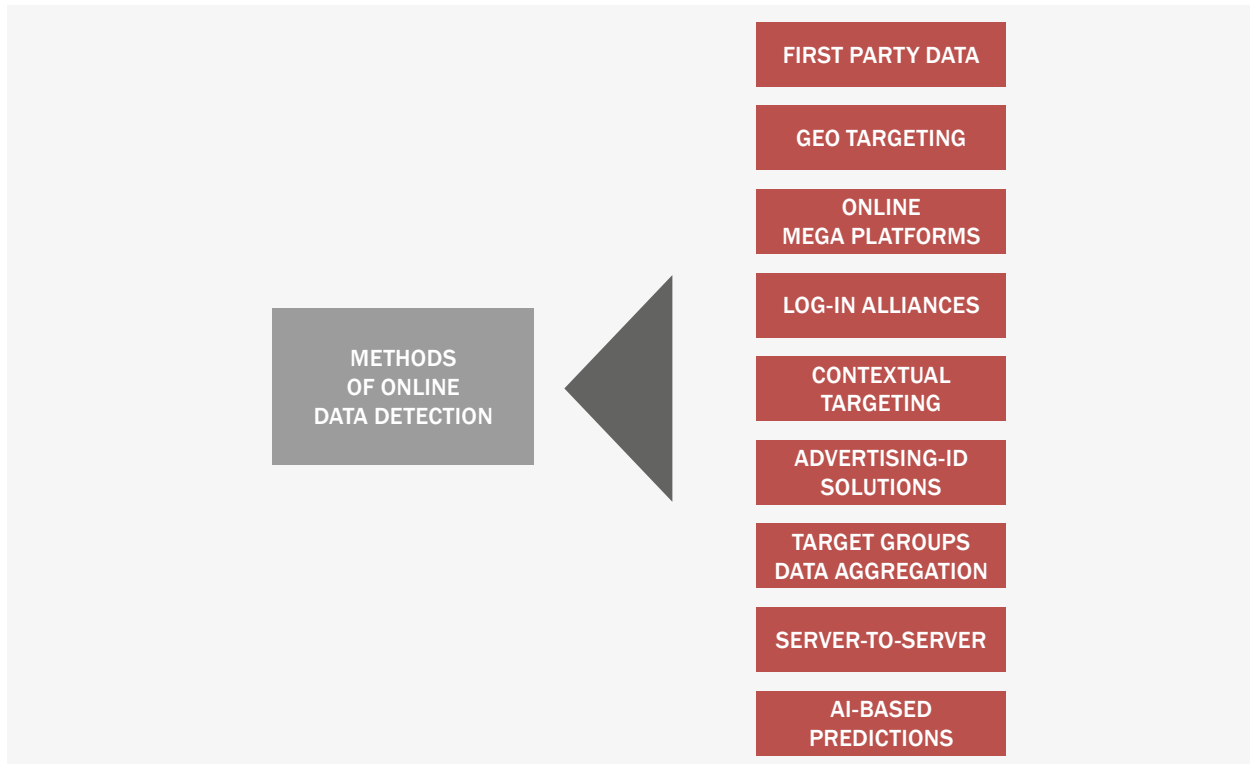


Fig. 4.3 Selection of online data collection methods as complements and alternatives to third-party cookies.
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rating to combine target group data, such as age and gender, with anonymized behavioral data. The objective is to play digital outdoor advertising in locations with a high number of people interested in the topics of family, sports or technology (Ströer 2022).

Online mega platforms

The competitive advantage of online mega-platforms – also called “walled gardens” or GAFA (Google-Apple-Facebook-Amazon) – is that registration is required for many functions. This personal data can be used for advertising purposes in the legally permissible form within the framework of data protection settings. Advertisers have the advantage that the target group can be

determined on the basis of detailed information and a large number of advertising environments with a high reach are available. One possible disadvantage is the limited ability to influence the quality of the advertising environments.

With the acquisition of the advertising technology platform provider Xandr by Microsoft in December 2021, another promising player has entered the digital advertising market. Microsoft has an attractive data pool through the Bing search engine, the LinkedIn business network, the MSN information service, cloud solutions and gaming platforms. The target group data available via these can now be implemented in combination with Xandr technologies for high-reach advertising campaigns.

Linking first-party data, for example from a CRM system, with user and target group data from online platforms can be particularly effective for advertisers. Reach can be increased and a link can be established between the advertising played and the advertising success, such as sales made.

Apple caused a furor when it provided the update for the iOS 14.5 mobile operating system in April 2021, which included the so-called App Tracking Transparency (ATT) function that required active consent for cross-provider tracking. It is estimated that only 10 to 20 percent of users give consent. This measure led to high revenue

losses from large advertising technology companies and platforms, such as YouTube, Instagram, Snapchat, Twitter, but also many other advertising marketers.

Log-in alliances

To counterbalance the market power of online mega platform providers, the so-called log-in alliances were founded, including European netID Foundation and Verimi. The idea is that users register once on a website and define their consent to advertising. The same log-in can be used on other websites affiliated with the alliance. NetID is also one of the advertising ID providers. The acceptance of this method will depend on the importance of the respective alliance partners and the benefit users get from the log-in.

Contextual targeting

Contextual targeting bypasses the barriers of the above-mentioned methods. Advertising is placed within environments that match each other thematically. With the help of artificial intelligence, large volumes of data can be analyzed on the web, the appropriate advertising placed and automatically played out to website visitors. Solutions are available from Criteo and Seedtag, for example. Here, too, it is interesting to combine first-party data with information about the preferred context in which users move in order to increase reach through target groups with similar interests. Contextual targeting does not require

any personal information, but measuring success is more difficult.

Advertising ID solutions

Advertising companies can connect to the offering of so-called advertising identifier (ID) providers as partners. For example, an e-mail address is sent pseudonymously to an advertising ID provider, which returns an ID to the company. The advertising ID provider can match the IDs of a large number of partners, provide target group information on the basis of which advertising is played out. Solutions include NetID, Liveramp, ID5 and Unified ID 2.0, among others. Deutsche Post's "Consentric" address matching technology, which matches address data of a website visitor with a microcell of about six households, works in a similar way. An encrypted microcell ID is then reused for advertising purposes.

Target groups data aggregation

In the aggregation of target group data, users are grouped into groups with similar characteristics (cohort formation) based on surfing behavior, location information or real-time data such as the weather. The aim is to exclude the possibility of drawing conclusions about individual persons.

Server-to-server

With the server-to-server solution, user data is transferred from the browser to a neutral server and stored in an ID-based manner in compliance with data protection regulations. From

the central server – no longer directly from the browser – the data can be sent to ad servers and linked to further data. In this way, the advertising company retains control over the user data and its forwarding or use. For the technical implementation, there are solution providers that can also manage consent management to meet data protection requirements. The perfumery company Douglas uses this technology for its online platform (*Zunke 2021*).

AI-based predictions

Based on customer data, analysis data of the media channels and behavioral data in real time, user- or context-oriented target group data can be determined in high quality with the help of artificial intelligence. Predictions about purchase probabilities or high-reach media channels can be made or incomplete user profiles can be supplemented.

4.4 Target Group Data Management Platforms

The technical realization of target group data management platforms takes place either in specialized solutions, such as customer data platforms (CDP), data management platforms (DMP) or within web-to-publish systems on an integrated technical level, which brings together, enriches and prepares data. Another development in the context of media planning and control are the "Data Clean Rooms".

4.4.1 Customer data platforms

A Customer Data Platform (CDP) collects, connects, profiles and segments, analyzes, forecasts and activates recipient and target group data for marketing and communication purposes.

The focus is on already known recipient data, which usually comes from customer relationship management (CRM) databases and can be enriched with other real-time usage data, such as web analytics, and data sources. Zero, first, second and third party data as well as ID solutions or geotargeting are used. The combination with product data and prediction data from web store recommendation engines also enables the contextualization and target group-specific output of personalized websites or print products for one-to-one communication.

The customer data platform is a data basis that cannot be used stand-alone, but must be connected to other systems, such as content management systems (CMS) or advertising material portals. This requires documented interfaces (APIs, Application Programming Interfaces).

4.4.2 Data Management Platforms

Like customer data platforms, data management platforms (DMPs) bring together data from multiple sources, but are more oriented toward processing target group data in compliance with

data protection regulations with the objective of acquiring new customers. The first-party data in a DMP is usually anonymized and supplemented with second- and third-party data. The objective is one-to-many communication rather than one-to-one targeting. DMPs also form a data basis within the infrastructure of automated programmatic advertising.

4.4.3 Data Clean Rooms

Data Clean Rooms are technology platforms used for targeting, media planning, reach measurement and success analysis.

For this purpose, several advertising companies join forces and make their pseudonymized first-party data available, while retaining data authority for the individual company. This data is merged with other data sources from advertising space providers, such as Google, Meta, Amazon or even TV providers, and statistically analyzed. The findings flow back to the advertising company and provide an important basis for further marketing campaigns. Data Clean Rooms are being developed by Google, Meta and Amazon, among others, and advertisers such as Unilever and Deutsche Telekom are already making their first experiences with them.

4.5 Media-neutral data management

The consequent separation of contents, structures and formats enables a working method in which the same contents can be output in different media channels in the respective media-specific formatting (Fig. 4.4).

Content:

Contents are marketing texts, product information and pictures. The content is managed and maintained in databases in the form of data formats such as CSV, JSON, HTML or XML.

Structure:

The structure determines the structure of a publication, website or app. The structural elements describe tasks such as headings, product descriptions, product images or article numbers.

Format:

The format determines the appearance of the content and is defined within layout templates and style sheets (page formats, chapter divisions, image sizes and font formatting).

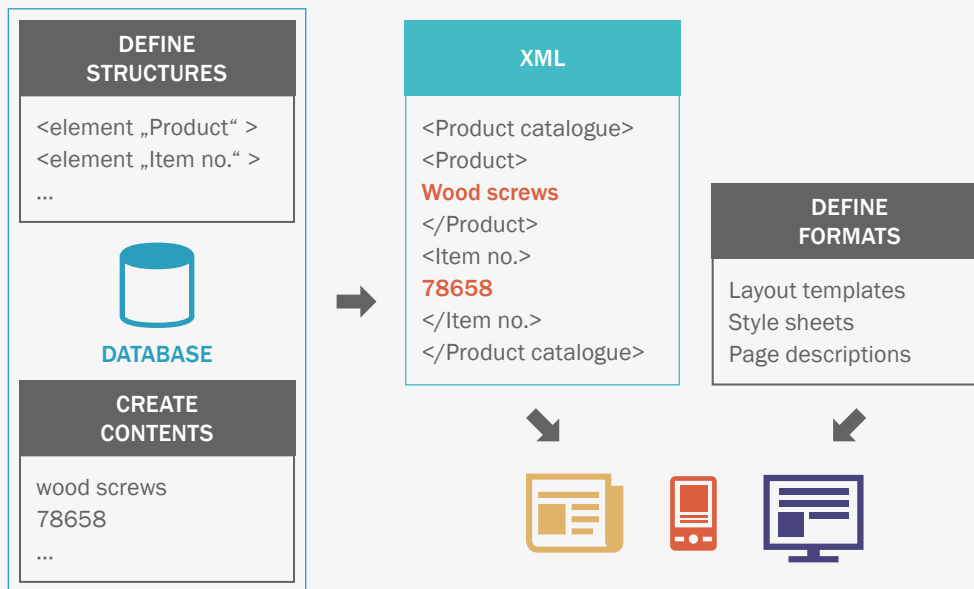


Fig. 4.4 The separation of structure, content and formats with XML. (© Melaschuk-Medien /skarín – Fotolia.com)

To realize the basic principle of separating content, structure and format, data is usually managed in databases – mostly in standardized data formats such as CSV, JSON, HTML or XML, which allow multiple use. XML is an important markup language for hierarchically structured data that consists of text characters and is primarily used for data exchange between computer systems, especially on the internet (*Wikipedia 2021b*).

The advantage of XML is its standardization, on the one hand via the World Wide Web Consortium (W3C), and as a subset of the Standard Generalized Markup Language (SGML) in the ISO 8879 standard. However, this generality also brings with it the disadvantages of greater complexity and the resulting larger volumes of data that have to be processed. In practice, data exchange via XML often requires complex adaptations despite the standardization.

When using XML, content is captured on the basis of a structuring rule (such as an XML schema) with structural elements (in an XML editor) and stored as an XML data stream or managed in a database.

The XML data stream is then assigned to a media-specific template and output for the respective media channel, for example as PDF for the print area, HTML for Web pages, or EPUB for e-books. XML is used as standard for content management, especially in the publishing area.

There are also concepts that use HTML as the starting point for media-neutral data management, such as Web Content Management Systems (Web CMS). Since the structure elements for HTML are already predefined, their use is restricted to simply structured documents.

PrintCSS (Cascading Stylesheets) technology, which can generate PDFs based on HTML or XML for output of print documents and display in web browsers, is currently under development (chapter Print Technologies, Print CSS).

The decisive factor is the separation of the structure from the formatting, as this allows a single central source data set to be output in different media-specific format templates. If, on the other hand, the content, structures and formatting for each media channel were stored “decentrally” in a file, updates would have to be manually maintained for each individual media channel or content would be cumbersome to transfer, as the following example shows.

Example

A company produces printed product brochures. The text content is captured in Word documents, then transferred to Adobe InDesign documents and designed. Content from these brochures is also used on the company’s website. Text is copied from the InDesign document and pasted into the Web CMS. If the text changes, the update

must be performed once in the InDesign document and a second time in the Web CMS.

4.6 Publishing from a single data source

Content management in specialized database systems offers even more possibilities, such as continuous updating of content and media channel-independent access to data.

This publishing from one data source avoids sources of error due to the multiple maintenance of data and enables the simultaneous, automated output of publications and information. This also implements the “Content-First” principle, in which central content forms the basis for media channel production (Fig. 4.5).

By means of the media-neutral mode of operation, very efficient production processes can also be realized. However, a relatively high conceptual effort is required. For this reason, solutions are also in great demand that enable the export of digital advertising media on the basis of existing print documents.

The goal: maintain content only once

With database-driven, media-neutral data management, the goal is to make changes and updates to the content only once and to transfer them to the templates or output media largely automatically. However, a “source file”, such as an image, cannot be used unchanged for all

different media channels. Depending on the output channel, individual technical parameters or content must be able to be used.

Examples:

- Images are required in various resolutions and data formats for print and digital editions.
- There are different combinations of product information for the printed catalog and the website.
- There are text variants for the print product, the website and the app.

These requirements must be taken into account when designing a media-neutral working method and setting up databases.

Media objects

For media objects, there are two possibilities of media-neutral management: Firstly, the linking of an original application file with variants that are saved including their media-specific properties. If the original application file changes, the linked variants are also changed.

The second option is to save the original application file permanently and only convert the media-specific variants on request. In this case, the variants are not stored permanently in the database. This option requires more computing power and a data transfer, but there are not so many objects stored in the database, which could complicate the overview.

Examples:

- Original image: Colour space Adobe-RGB, resolution 600 ppi (pixels per inch)
- Print version: CMYK colour space, 300 ppi resolution
- Variant Website: Color space sRGB, resolution 150 ppi

Product data

Product data is stored in structured form with the possible properties of a product in individual categories and fields. There must be a field for each product property that is required in the media channels. This also includes translations.

The structures within a product database can be very complex, as product data is made available for several business areas, such as product management, marketing and sales, customer service, or production and design.

Since companies often have other systems with product information, such as merchandise management systems, these are connected via an interface and the content is synchronized. This is to ensure that the information is only maintained once, at a central location.

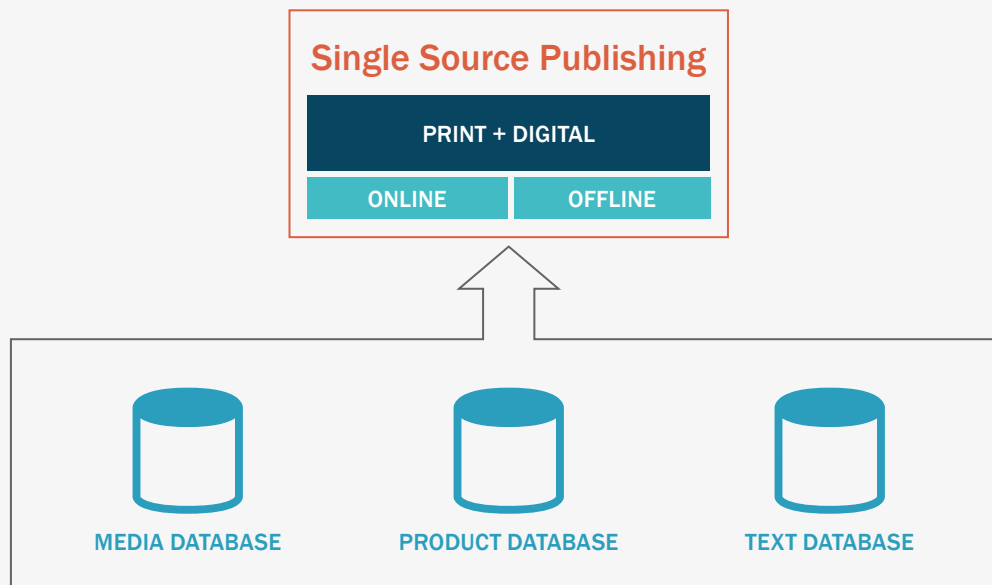


Fig. 4.5 Concept of Single Source Publishing. © Melaschuk-Medien

Text data

The structured administration of text data in a text database is usually carried out within editorial systems in so-called content management systems, which are mainly used for periodical publications or in the corporate publishing sector.

Text data for marketing materials is often created and maintained within a product database. Variants of text content, such as short and long text versions for a product description, should be able to be managed in structures that allow media channel-specific management.

The possibility to store “source code” and manage variants derived from it is more commonly found in editorial-oriented systems (Content Management Systems, CMS). Here there are special functions, like inheriting or even synchronizing text changes in linked variants.

5 CROSS-MEDIA PROCESSES AND PRODUCTION ROUTES

SUMMARY

In this chapter, cross-media processes and production routes are examined from different perspectives.

The first step is to clarify the terms. This is followed by a comprehensive description of media processing, which is relevant to marketing and includes both classic and programmatic processes.

Other topics show detailed aspects, such as different degrees of personalization in advertising media and variants of the creation of cross-media publications, which in turn are also relevant in the publishing sector.

A description of system concepts allows the identification of key aspects of software solutions and can help to classify certain systems with regard to the right area of application.

Practical examples show multichannel publishing based on Web CMS or databases. Further content deals with print technologies such as Programmatic Printing, PrintCSS and Web-to-Print.

5.1 Terms and principle cross-media

There is now a whole range of terms relating to one and the same complex of topics: cross-media, cross-channel, multi-media, multi-channel or omni-channel. Multi-channel refers to several channels that are designed, operated and organized independently of each other.

When using the prefixes “Omni” or “Cross” (as opposed to “Multi”), such as “cross-channel” or “cross-media”, it is often said that the individual media channels are related to each other.

Depending on the perspective, the concrete characteristics then turn out differently. In retail, for example, the organizational and technical link between stationary shops and web shops can be meant. The publishing sector, on the other hand, is concerned with the production of publications for print, e-books and apps with largely the same content. In product marketing, on the other hand, an online advertisement links to a landing page (special product website).

The background to this is the fact that consumers are increasingly using several communication channels, the benefits or effects of which increase when they are related to each other.

The lowest common denominator of all terms is that it is about the creation and output for two or more media channels. Further differentiations

consist in whether the individual media channels are each published as a single entity with all components (as a “silo”), on the basis of a uniform database (standardization of the media channels) or have additional connections to each other (interlinking of the media channels).

Standardization of media channels

In order to maintain a homogeneous appearance in the different media and to ensure a high recognition value as well as to avoid multiple efforts in media creation, the goal can be pursued to output on the basis of central multi-

media data sets as simultaneously as possible in different media channels (Fig. 5.1). For example, products that are displayed simultaneously in an app and in a web shop should be uniform in terms of designations, images and other information. The data sets are managed in media, product or content management systems, linked to the respective media-specific structures, format templates and functional environments and published in the respective media channel. This is achieved through central data management.

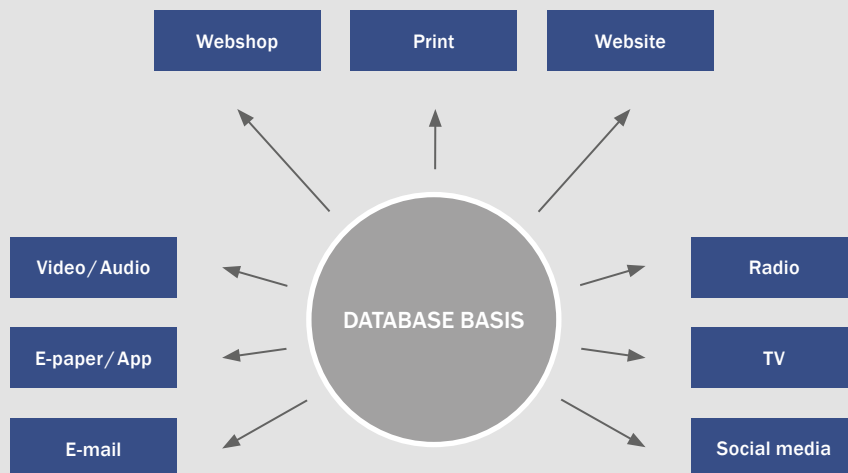


Fig. 5.1 Standardization of media channels: The contents in the media channels are to be displayed uniformly by means of central data management. © Melaschuk-Medien

Interlinking of media channels

In interlinking, the representations in the media channels contain links to each other in order to guide users from one medium to another (Fig. 5.2). It is necessary to use interactions and to achieve a strengthening of the respective media. The aim is to motivate the user to certain actions.

For example, print mailings may contain an NFC chip with an encoding that leads to a personalized website where products can be purchased in a special promotion. Standardization of media channels is also possible.

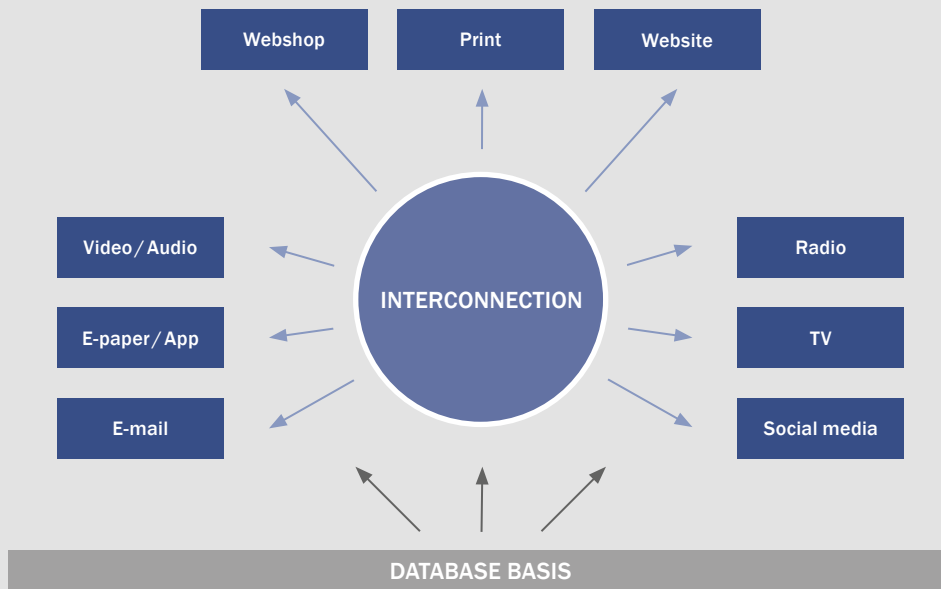


Fig. 5.2 Interlinking of media channels: Media channels are interconnected in order to reach and route recipients via different media. © Melaschuk-Medien

Merging of media channels

Media channels merge when previously different transmission and display technologies enabled playback on only one medium (Fig. 5.3).

Examples: Television or radio programmes can be transmitted on the internet or television sets with internet access make it possible to transmit online video data.

This book deals with the concept of cross-media with a focus on the aspects of technical and practical implementation.

Crossmedia process in the overview

In the following overview (Fig. 5.4) of a cross-media process, the database (database systems and data formats), content capture and the internal or external creation of media channels are included in the analysis.

In principle, it is recommended to follow the “content first” approach when designing IT solutions or media productions, in which content is centrally administered once only and then transferred to the media channels.

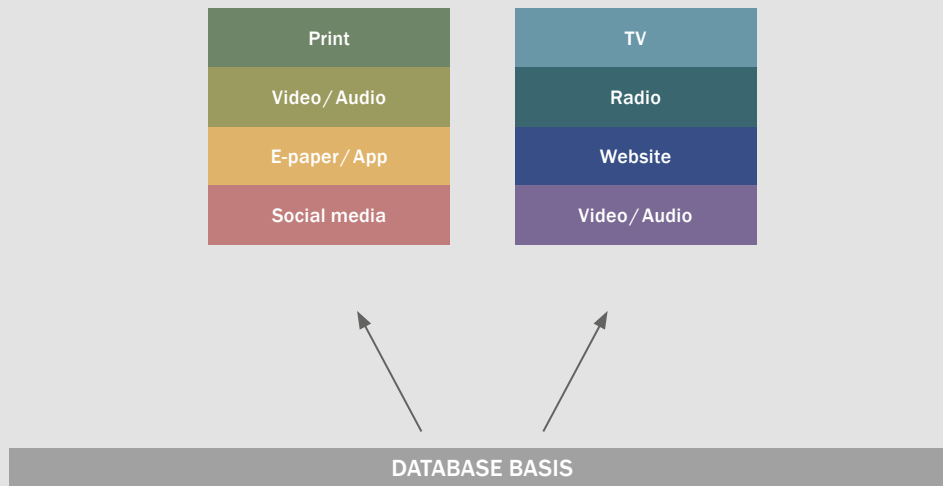


Fig. 5.3 Merging of the media channels: Previously isolated media channels can be used in an integrated way.
© Melaschuk-Medien

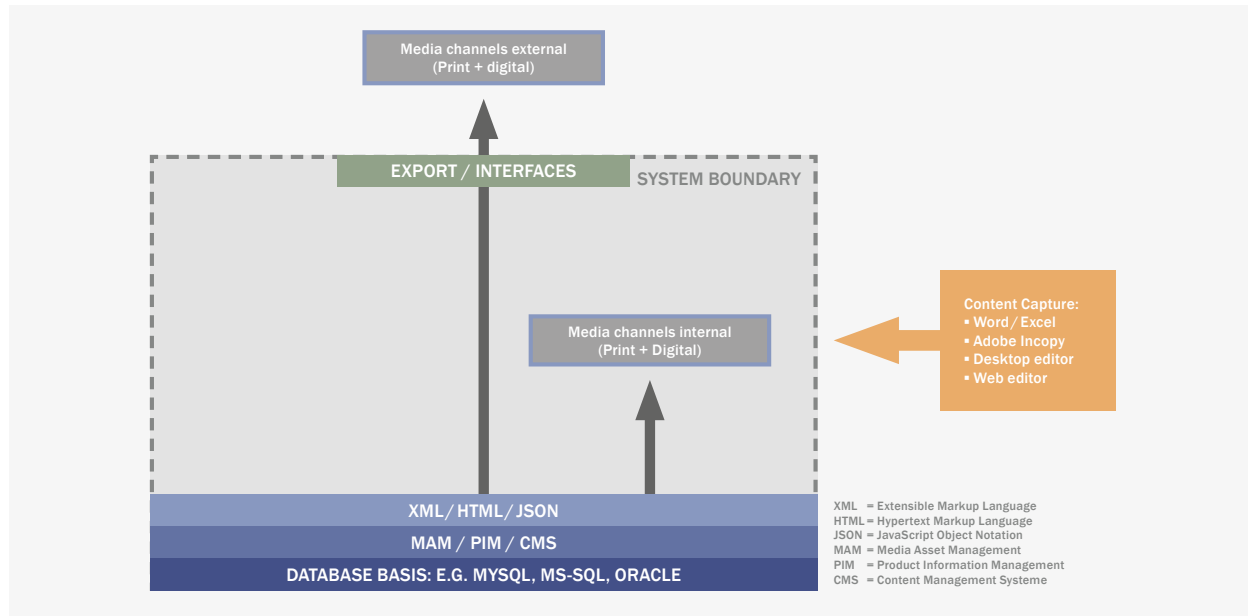


Fig. 5.4 Cross-media process in the overview with the elements databases, content capture and media channels.
© Melaschuk-Medien

Databases and data formats

When using a web-based publication system, a database basis such as mySQL, MS SQL or Oracle is used to manage all content such as user data, metadata, production and order data.

Specialized database systems can be used integrated or via interface. These include in particular media asset management (MAM) systems, product information management (PIM) systems or content management systems (CMS). Within the specialized database systems, content including its structural information can

be managed in XML, HTML, JSON or other media-specific data formats.

Content creation

Content is created using external application programs such as Microsoft Word, Microsoft Excel, Adobe InCopy or system-specific desktop or web editors. Desktop editors can also be used offline and, if required, establish the online connection to the system. The editors are either compatible with the respective system or the content is transferred to the system via conversions.

With the media channels, a distinction can be made between whether the creation or finalization in connection with a preview function takes place within the system or whether the media channels are created externally.

Internal media channels

In the case of internal processing and creation, the publications, advertising media or templates are produced, individualized, edited or ordered completely or partially internally in the system. Examples are the individualization of print templates in the system or the creation of HTML design templates in the system for a landing page.

External media channels

In the case of external processing and creation, the publications, advertising media or templates are produced externally and individualized, edited, ordered or linked with data in the system. An example is the external creation of print PDF files and ordering in the system within a web shop.

5.2 Data and workflows of media processing

In the context of digitization, more and more possibilities are being used to play out advertising in real time in a data-based, automated and target-group oriented manner. But not only the placement of advertising, but also media booking and order processing up to invoicing is automated and contributes to an optimization of business processes. In this chapter, the classical as well as the automated or programmatic processes are examined.

5.2.1 Automation of advertising

In marketing portals, the automated process flow already begins with the approval and creation of digital and printed advertising media (such as ads, posters) and ranges from the planning, selection, booking and distribution of media to integrated billing. The practical process: Users can select the advertising medium, such as a Facebook or Google Ad, add parameters (keywords, individual data) and display them. The success of keywords is monitored and adjusted automatically.

So-called “Programmatic Advertising” includes digital advertising and, according to a definition by the BVDW, describes “the automated control of individual advertising contact opportunities in real time” (*BVDW 2022*). In the area of online

advertising (including outdoor advertising), this is referred to as “Programmatic Advertising”, in the area of TV as “Addressable TV”. Audio Programmatic” is also on the way – on the basis of digital radio usage data.

A large field of application is the automated delivery of online ads. Since the end of 2021, Google has offered the option of creating ads fully automatically for multiple channels, such as Google Search, YouTube, Display Network, Google Discover, Gmail, and Google Maps, based on text, image, and video assets. Campaign optimization is also automatically AI-based using target group parameters and other information that the advertiser can provide (*Braitsch 2022*).

There are also exciting applications in the out-of-home area. In 2021, one of the best media strategies in the field of outdoor advertising was a sustainability campaign by Nespresso Germany. Based on data and target group analyses, motifs on the recyclability of coffee capsules were played out on digital screens, primarily in the area around Nespresso stores (*PlakaDiva 2021*).

The “Code of Conduct Programmatic Advertising”, which was initiated by the BVDW (*BVDW 2019b*), obliges participating market players to meet minimum standards in order to increase quality and transparency in this area. This includes, for example, the advertising environment, campaign

control, which includes the billing of data or the visibility of advertisements, and advertising media.

In studies by the market research company Gartner, advertising technology providers include digital ad management, campaign planning, media buying, and advertising analysis, optimization, and automation (*Gartner 2021a*).

In the print sector, we speak of “programmatic printing” when advertising materials, such as mailings or catalogs, are created in a target-group-specific, database-driven and automated manner and fed into logistics processes (for example, postal mailings).

Cross-channel campaign control and integration into planning will be a major challenge for software providers and their customers in the future.

5.2.2 Overview media processing

The following presentation of media processing (Fig. 5.5) comprises the data levels, including data sources, data management and online and offline advertising media. In digital marketing, available advertising space is also referred to as “advertising inventory”.

On the other hand, the process level is represented with the partners involved, such as the client and media provider, as well as the classic

or programmatically controlled execution within the context of media processing.

Participants, such as media agencies, media service providers, marketers, online, demand-side or supply-side platform providers, can also have several functions simultaneously. These overlaps are not shown here for the sake of transparency.

5.2.2.1 Clients

Advertiser, Agency, Marketing portal Media agency, media service provider

Advertisers and agencies are clients for advertising that either buy directly or through media agencies and media service providers that offer additional services such as consulting, campaign management, commercial processing, technical platforms or reporting.

Marketing portals can have the function of a system-supported ordering platform and be connected to booking platforms via an interface.

The order is placed either with the publishers, for example website operators, advertising space providers, marketers and online platform providers or – in the case of automated programmatic purchasing – with providers of demand-side or supply-side platforms. Orders are also placed with commercial advertising agencies that buy advertising space as “intermediaries”.

5.2.2.2 Technical platforms

Demand Side Platform (DSP)

Demand side platforms are technical platforms within the scope of Programmatic Advertising. Advertising inventory is made available for demand, i.e. the clients, is purchased automatically in real time and the advertising media are controlled. This is done on the basis of target group parameters and various price models, such as auctions or fixed prices. DSPs can be cross-channel or media-specific, such as for television, online video, out of home or the mobile sector.

Verifications within a DSP can integrate additional quality measures with regard to fraud protection, brand conformity, visibility or environmental suitability of the displayed advertising.

Supply Side Platform (SSP)

Supply side platforms (SSP) are technical supply platforms within the scope of Programmatic Advertising. Marketers, publishers and advertising inventory providers use these platforms to sell their advertising space to connected partners, such as DSP platforms, taking into account rule-based target parameters such as the highest possible prices. An SSP can be connected to one or more DSPs. Individual SSP providers also offer the possibility for advertisers or agencies to use the SSP offer directly via online access and thus bypass DSPs.

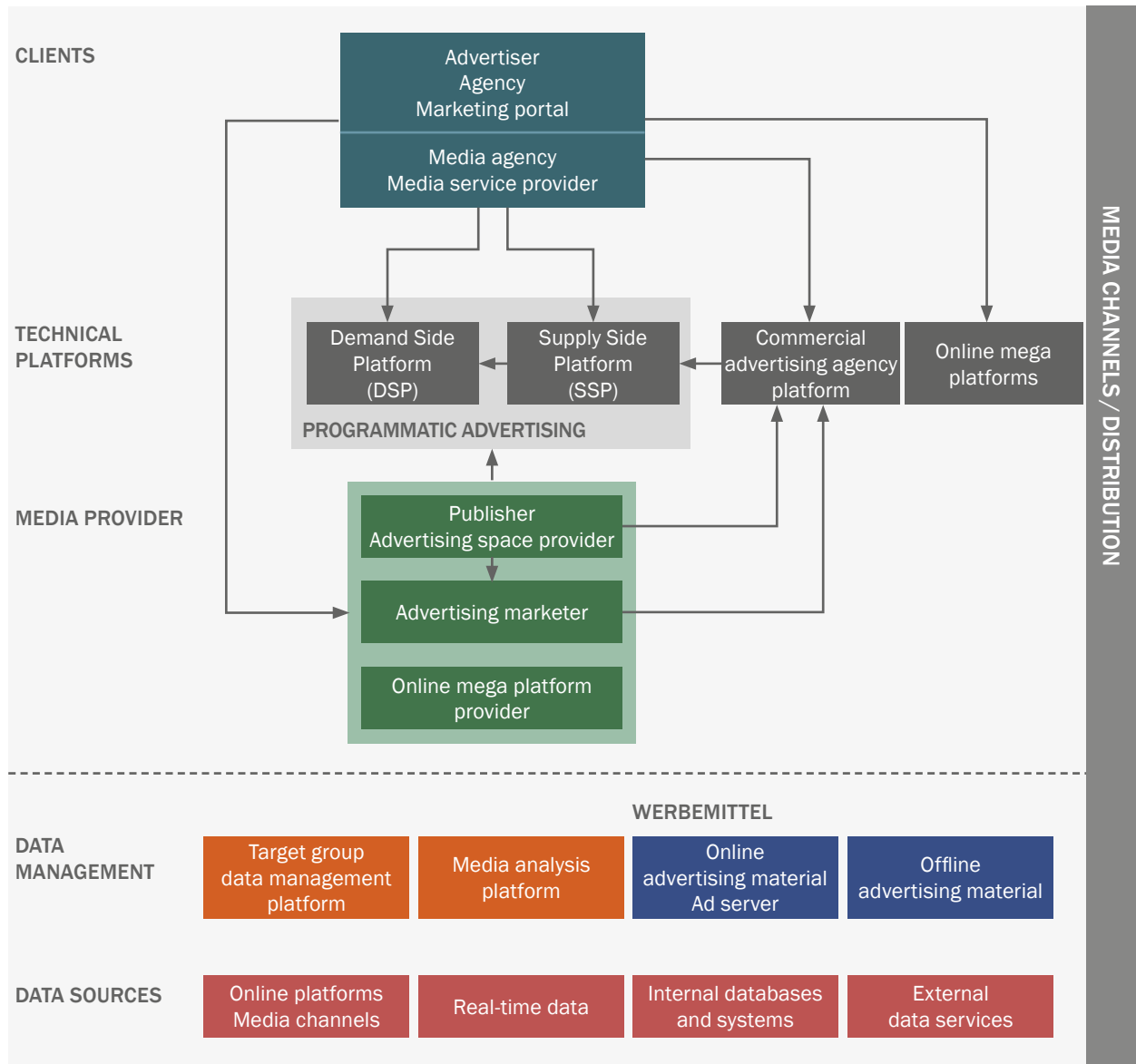


Fig. 5.5 Overview of media processing with classic and programmatic workflows. © Melaschuk-Medien

Commercial advertising agency

Trading desks buy advertising space or digital advertising inventory from media providers and often offer combined services of media buying, technology, targeting, and campaign optimization. Advertising media are controlled via Programmatic Advertising, own technologies or manually.

Online platforms

Online platforms include the providers Google, Facebook and Amazon, which offer online access for self service management on the one hand and standard interfaces in the form of APIs (Application Programming Interface) for direct connection and placement of advertising materials on the other. In some cases, the platform providers also have their own DSPs that can be used to programmatically purchase their own and, in some cases, “third-party” advertising inventory.

5.2.2.3 Media provider

Publisher, Advertising space provider

In the field of digital marketing, publishers are operators of online platforms and media channels, such as websites, apps or television, who sell advertising inventories. In the print sector, this includes newspaper and magazine titles. Advertising space providers also sell offline offers, for example outdoor billboards. The offers of these providers are sold either directly on their

own, through marketers or in the digital sector via supply-side platforms (SSP).

Media provider

Marketers act as “intermediaries” and sell the offers on behalf of publishers and advertising space providers.

For the following media channels, there are specialized offers for advertising from publishers or marketers, which are also offered across channels depending on the provider:

- Publishing titles Print, digital (newspapers, magazines)
- Online and display
- Search engines (SEA, Search Engine Optimization)
- Mobile, Apps
- Out-of-Home, posters
- Cinema
- Radio
- TV, Online video

Online platform provider

The platform providers Google and Facebook, but also large trading platforms such as ebay, Amazon or Zalando, have a rich database that enables advertisers to control their campaigns in a targeted manner. For example, various target group parameters can be determined in Facebook, such as age, gender, interests, behaviour or geographical locations.

Microsoft will also offer the opportunity to use its first-party data for targeted advertising campaigns in the future through the acquisition of advertising technology platform Xandr.

5.2.2.4 Data management and advertising material

Target group data management platform

Data management platforms (DMP) with a focus on target groups are technical platforms for measuring, analyzing and managing online and offline data, which are used for programmatic trading and target group-specific control of advertising media. Customer data platforms are also part of this. These can, for example, be operated by marketers and publishers to enrich media services, but also by clients.

Media analysis platform

On a media analysis platform, target group and reach data of media channels are brought together, analyzed and evaluated. Depending on the provider, geotargeting is also used. Geotargeting combines information on target groups (age, gender, interests) or media channels (distribution) with geographical data, such as addresses, and visualizes it in a user-friendly way using maps. For example, it can be used to illustrate in which urban areas residents with certain income areas and interests live. Advertising activities can be coordinated and optimized accordingly.

Advertising material

Advertising materials are provided online or offline. Specialized ad servers can be used for online advertising media.

Data sources

The data sources, such as internal databases and systems, online platforms and media channels, real-time data and external data services, are explained in more detail in chapter *“4.2 Data sources” on page 76*.

5.3 Target group-oriented advertising media and media channels

On the basis of the described data sources and processes, information can be created and distributed in marketing and communication at suitable times and places for specific target groups. The target group can, depending on the availability of the data, be relatively “unclear” defined, e.g. related to a location, or apply to a single person. The English term “targeting” is often used to determine the target group.

Examples of target group parameters are: Customer or prospective customer, women or men, areas of interest, purchasing power, purchasing activities, geographical location and time of day information.

Retailers and web shop operators can create personalized advertising media for their cus-

tomers based on target group parameters such as gender, age, purchase history and click behaviour. Log-in-protected environments, such as online shops or social media platforms, provide characteristics that can be precisely assigned to individual persons. According to the previous and expected customer behavior, the appropriate products are selected from a product database and displayed in the advertising media. Since the locations of the customers' homes are also known, reference can also be made to the nearest branch.

The target group parameters can influence the content of advertising material in different ways, such as the illustration of cosmetic articles in a drugstore mailing for female addressees. This is realized in particular in Programmatic Printing by including customer-specific purchase recommendations based on purchase history and product portfolio.

In other cases, the target group information is only used for distribution, for example the distribution of a furniture store brochure to certain households as part of a direct mailing. The same principle can also be applied to digital output channels, such as websites and web shops, to display personalized content.

Further basic parameters for determining target groups on the internet are thematically appropriate environments on websites, the click

behaviour of online users, geographical data (e.g. based on IP addresses), device data (such as manufacturer, display resolution) or user IDs from log-in data.

In retargeting, for example, customers are shown content on websites on the basis of their previous activities, the relevance of which is assumed for buyer behaviour. This principle can also be applied to the print sector, for example when personalized printed brochures take into account consumer behavior in online shops and are enclosed with the consignment of goods.

By combining this with the use of artificial intelligence, the success of personalized campaigns can be increased even further in the future.

The following workflows show the different personalization and individualization options for the output of advertising media. In addition, the different ways in which target group parameters are included in the technical creation of advertising media and the level of control in the media channels are analyzed.

5.3.1 Unpersonalized creation of advertising material

With this variant, advertising media are created without extensive personalization or individualization of content (Fig. 5.6). Media production is either database-supported, automated, semi-automated or manual, possibly by integrating export files from databases. Examples are brochures

of furniture stores, DIY stores, electric houses or advertisements.

At the same time, desired target groups are selected, for example using address service providers, household databases or special marketer data. The advertising media are then directed to these target groups, for example offline via direct mail, postal addressed items,

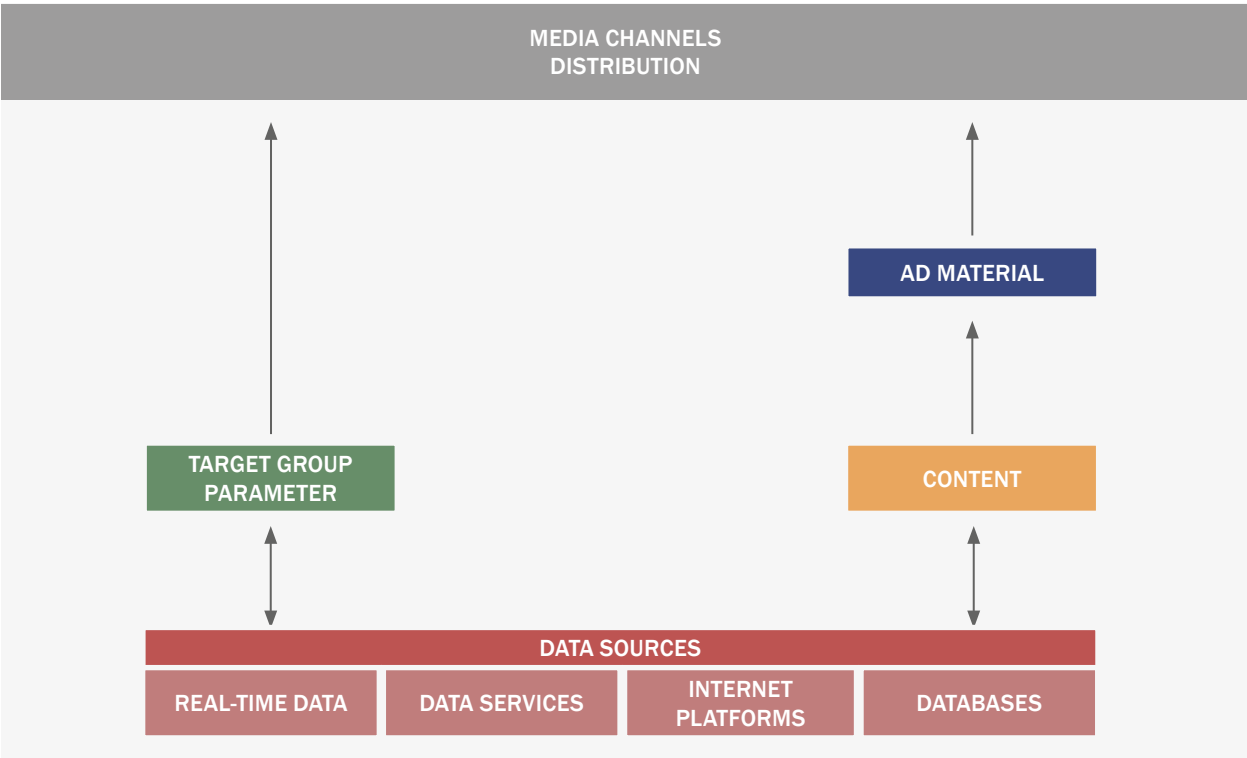


Fig. 5.6 Unpersonalized creation of advertising material. The advertising media are created without personalized content and distributed according to the target group parameters or media channel. © Melaschuk-Medien

as inserts in newspapers or digitally in the form of online advertisements on websites or in social media channels.

5.3.2 Partially personalized creation of advertising material

The unpersonalized advertising media can partly be personalized or individualized, for example by

imprints in digital printing or in marketing portals of brand companies. Corporate design-compliant templates are created unpersonalized and branch offices, branches or sales employees supplement individual data in the marketing portal in the form of contact data, regional offers or prices (Fig. 5.7).

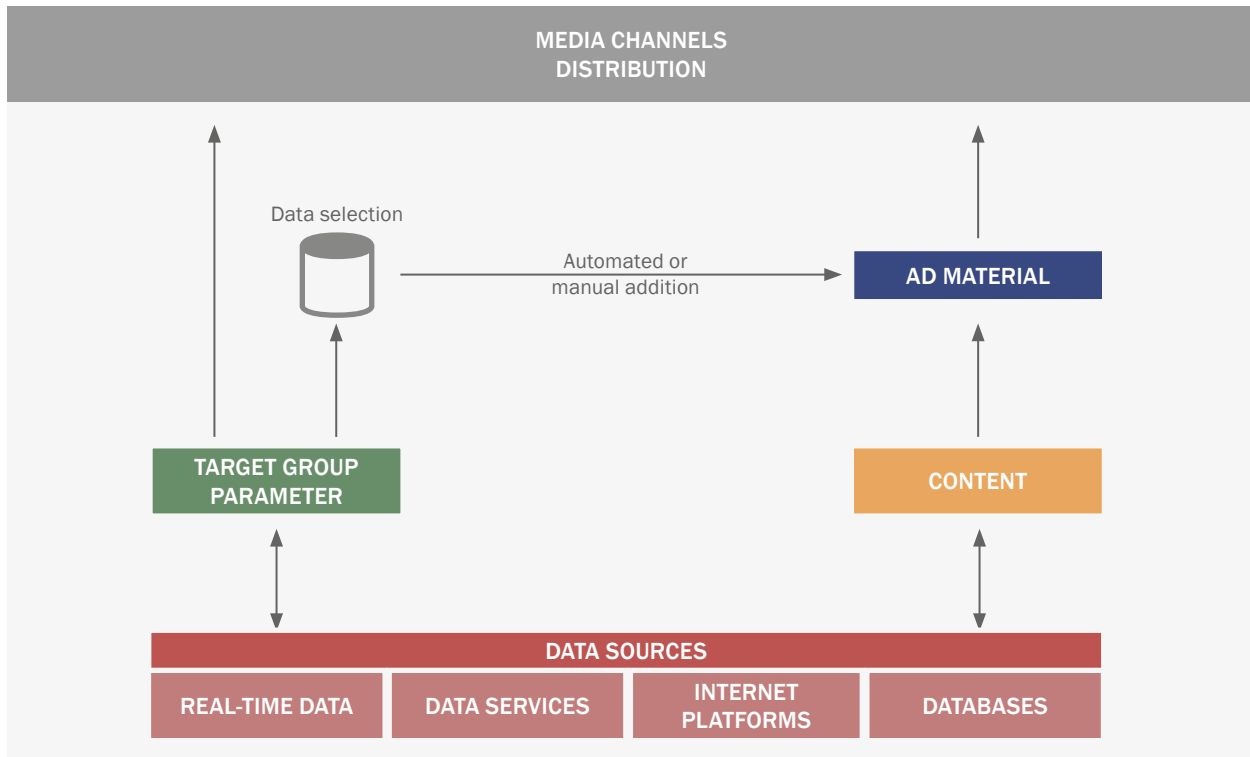


Fig. 5.7 Partially personalized creation of advertising material. The advertising media are largely created without personalized content and distributed by means of target group parameters or media channel-specific. © Melaschuk-Medien

Examples are flyers from insurance companies or dealers that supplement regional data or online ads that are also completed with regional data and displayed live in a certain regional area. Fully addressed direct mailings are also included in this area.

5.3.3 Fully personalized creation of advertising material

In this variant, the advertising media are largely created automatically on the basis of the target group parameters and personalized and individualized content (Fig. 5.8).

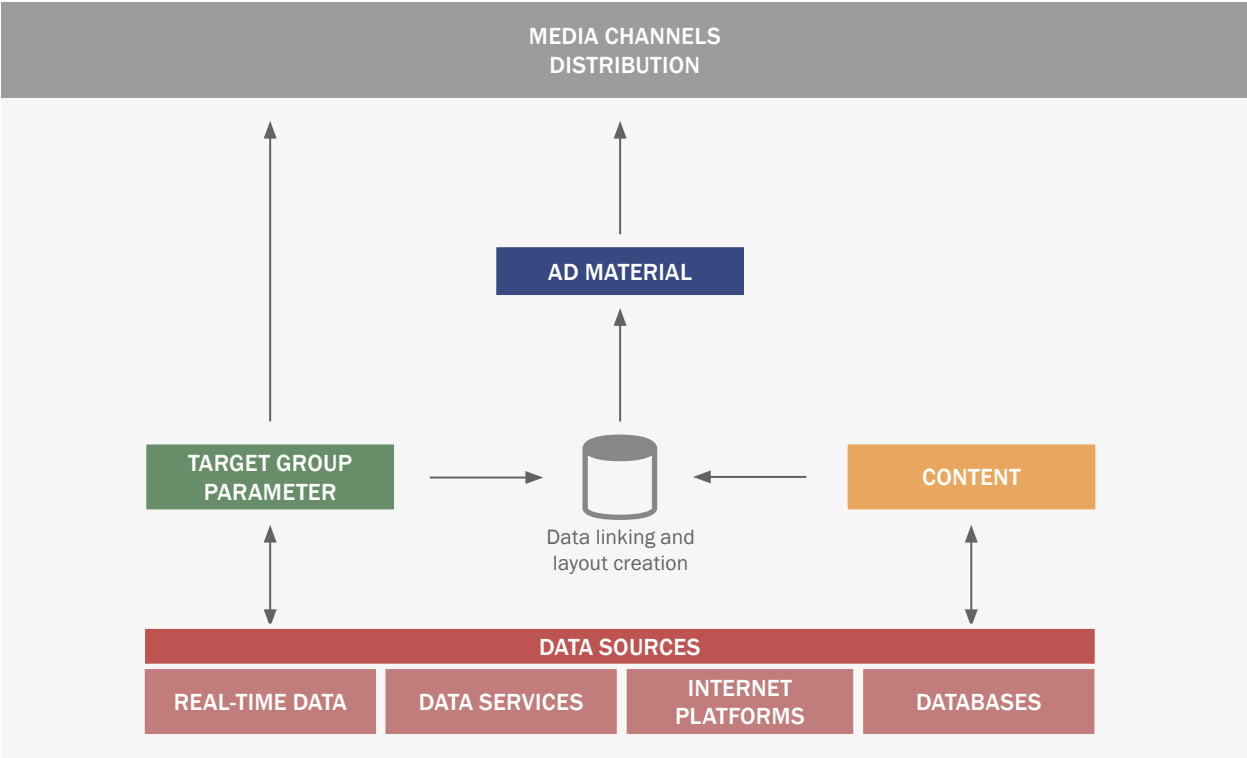


Fig. 5.8 Fully personalized creation of advertising material. The contents of the advertising media are created, issued or distributed in a personalized manner using the target group parameters or media channel-specific. © Melaschuk-Medien

In this way, websites, product recommendations in web shops or newsletters are personalized or individualized in real time, for example by determining location data on the basis of the IP address and displaying local offers or contact data of branches and subsidiaries. Information on the device types used, i.e. whether a desktop PC or mobile device is used, or whether a new visitor is involved and the click or shopping behavior, can also be used to derive suitable content in real time.

In the print sector, solutions are establishing themselves with which package or catalog inserts and mailings can be created in a fully personalized manner. This can be based on various data sources, such as customer relationship management (CRM) systems, enterprise resource planning (ERP) systems and recommendation engines.

The customer and product data are combined, linked to layout templates in an automatic process, output via digital printing and delivered to the recipients – either together with a consignment or in the form of print mailings. In these processes, target group parameters and the advertising medium itself are brought into almost 100 percent agreement.

Digitization makes it possible to design and deliver advertising media and media channels in a differentiated and highly target group-specific

manner. However, considerable challenges also have to be mastered: The structured structure and regular maintenance of data stocks as well as the intelligent linking of data sources require a relatively high conceptual effort.

Then, however, marketing campaigns can be implemented that align their messages with the individual recipient. Competitive advantages can be expected – through new customer acquisition, customer loyalty and higher sales.

5.4 Content-first with WordPress

BY SIMEA MERKI

“Content-first systems are expensive and therefore only something for large companies”.

A common opinion, which we have disproved several times in our practical projects with WordPress. The do-it-yourself way can do more than you may think.

Why WordPress?

Originally, WordPress is a web content management system that was originally built for blogs. However, WordPress also has great advantages that come into place when used as a content-first system. One plus is that WordPress is [open source](#). With open source software, anyone is allowed to use the software and its source code, modify the code, and redistribute it. This grants users a great deal of freedom.

A second advantage is the market share of WordPress. More than 40 percent of all websites on the Internet now run on WordPress. That helps in production. I always put it this way, “With WordPress, you’re never alone with your problem. Someone has had the same problem and can help you.” This is evident in the numerous plugins and extensions for WordPress. Almost for every need you can find a ready-made solution.

And then the third advantage of WordPress: The [community](#) behind WordPress. I don’t know any

other user group that is so interactive and helpful. This collaboration not only keeps WordPress alive, but also keeps it innovative.

XML vs. HTML

However, there is one big difference between WordPress and classic content-first systems. That is the code language in which the content is stored. [For WordPress this is HTML](#), for content-first systems it is often XML or JSON. There’s a very specific reason for this: XML and JSON can be validated in real time as soon as the content is created. So I can define structures or no-gos, which are then specified in the editor. This is a great way to ensure that all content can be automated. That’s a little more complicated with WordPress using the HTML editor. There are validation tools, of course, and in our projects this fact has never been a problem. But the difference in use should be conscious.

But that doesn’t mean that you are committed to WordPress forever: The structure of HTML and XML is very similar, and switching from HTML to XML data is possible as long as the content is cleanly structured in the database.

The structure of a WordPress content system

WordPress stores content in a [MySQL database](#). To enable connections, database access must be guaranteed. The free choice of the hosting provider is central for content-first projects and

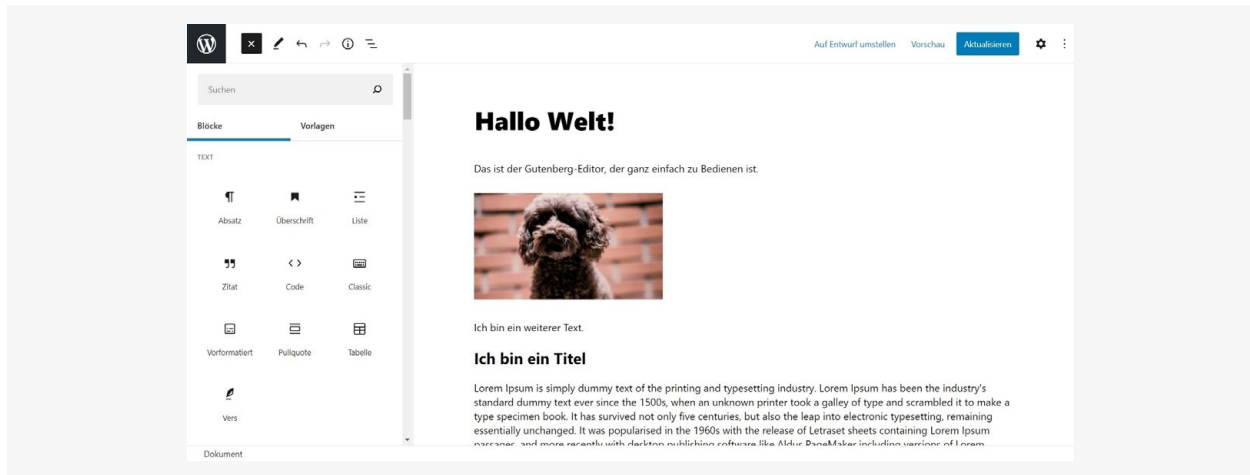


Fig. 5.9 The WordPress block editor in use. © morntag

only possible with the open source version of WordPress.

For content-first projects, one always uses the [WordPress.org](https://wordpress.org) version (open source). Do not confuse this with WordPress.com, which is a paid and maintained version of WordPress. WordPress.com is distributed by the company Automatic.

WordPress.com is to be seen as a competitor to other website builders like Wix, Jimdo and Squarespace and is not meant in this article.

The data structure in WordPress is quite simple. There are three important containers:

- Post Types (content types, such as pages, news posts, products in the store, etc.).
- Fields (content elements in the Post Types)
- Taxonomies (categories and tags for filtering)

These three containers can manage all types of content, which does not have to be editorial content. [Product management \(PIM\)](#) with multi-channel features or e-commerce is also possible. For this, we like to use WooCommerce, the most widely used webshop system for WordPress.

For editorial content or long-form content, the [block editor](#) of WordPress is great. It is also known as “Gutenberg” (Fig. 5.9):

The principle is simple: Each content element is a block. A paragraph, a headline, an image,

or more complex content such as tables and embeddings from YouTube, Twitter, etc. The block library can be expanded with self-programmed blocks or plug-ins. This makes it easy to handle diagrams and other more complex content. The Gutenberg editor can be simplified. Everything that is not needed can be hidden. We have had very good experiences with the editor in our projects. It is easy to use, runs in the browser and is even operable in the WordPress app on mobile devices.

Possible output channels

In principle, almost all output channels are possible with WordPress. The output channel **web** is given with WordPress from the beginning, because it is originally a web CMS. The connection to the MySQL database and the WordPress own interface REST-API open practically every channel. I present the most common ones in this section.

If you want new content to land automatically on **social media**, there are basically two options. Option 1: You work with a WordPress plug-in, for example Blog2Social. This allows you to prepare posts directly from the block editor for social media and then play them out. However, the plug-in requires you to make minimal adjustments to the content for social media. If you don't want to do that, you're better off using an automation service like Zapier or Integromat,

which automatically play out the content on social media without manual intervention.

If the content is to be turned into a printed magazine, then a connection to **InDesign** is a good idea. There are two ways to achieve this objective: EasyCatalog (65bit Software) or press2id (Gregor Fellenz). EasyCatalog is connected to the MySQL database via an ODBC interface. The import process is then hardly differentiated from other EasyCatalog processes. A simpler, but not as extensive solution is press2id. The InDesign script by Gregor Fellenz can read a WordPress JSON link and thus import the content. press2id is a good solution for a quick import and can save a lot of copy-paste work. However, when it comes to catalog or magazine production, a more comprehensive tool like EasyCatalog is recommended.

Sometimes there are print products or PDFs that do not require manual intervention. In this case, going via InDesign would be an unnecessary extra effort. That's where **PrintCSS** comes in. The basis for this is the "Paged Media Module" of CSS3, which deals with printed media and makes it possible to render PDFs directly from HTML, CSS and JavaScript. For this you need a PDF renderer, which is connected via an API. You can also automate such processes with WordPress, for example with the plug-in "Magazine" by Andreas Zettl. The PDF generation can even be triggered by end customers on the website.

Of course, that's not all. Newsletters, apps, progressive web apps (PWA) and audio output (text-to-speech or podcasts) are also no problem with WordPress. This results in an extensive range of possible channels (Fig. 5.10).

An open source system requires self responsibility

WordPress as a content-first system could be described as a “do-it-yourself” project. That's what differentiates WordPress from most other systems. You have to do it yourself. With traditional systems, whether new channels and technologies can be served is basically up to the vendor or integrator. But that's dangerous.

The innovation of a publishing tool should not be pre-determined by the system or the technology. Ultimately, the needs of the publisher and the

target market should decide where the journey is directed. Not a software. This is where a closed content management system can fail. An unintended output channel may not be connectable or expandable. This dependence on a CMS provider can thus limit innovation. In the WordPress environment, one is freer there, but must take this responsibility and develop the system on one's own.

A do-it-yourself system democratizes the market

WordPress proves: Multichannel publishing systems don't have to be expensive.

Small companies and publishers can introduce such systems with a suitable budget. This is a reminiscent of developments we've seen in the

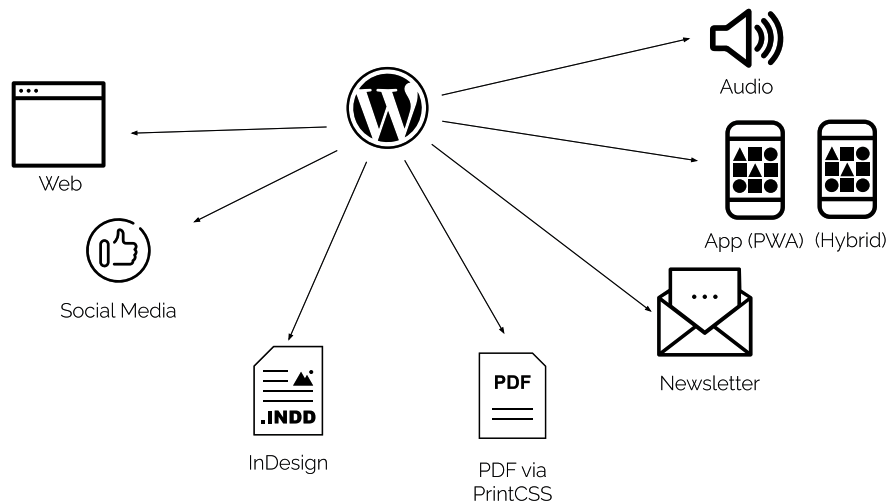


Abb. 5.10 Based on WordPress, numerous output channels can be directed. © morntag

last few years of digitization. Whether it's web-sites, print design or other channels; **producing yourself will become easier and easier**. This also applies to multichannel systems.

Publishers and content creators are able to assemble and maintain their multichannel system themselves. The experts are then involved on a selective basis. For example, for personalized solutions or consultation in advance.

This development is what excites me personally about the solution with WordPress. Companies that have hardly dared to dream of Content First, now can suddenly use it and look after it independently if they have digital skills. **In the end, this is a democratization of the media and publishing landscape** that provides more equal opportunities, regardless of financial resources.

As the media landscape continues to evolve, **everyone who can quickly adapt their systems to the latest circumstances wins**. Those who appreciate and use the wide distribution and community of WordPress are well placed to do so.

This means that digital skills are becoming increasingly important for publishers. A WordPress system requires more personal responsibility, but offers more freedom and adaptability.

SIMEA MERKI

Simea Merki is part of the family business “morntag”. As the daughter of an entrepreneur (Haeme Ulrich), she learned early on what it means to think entrepreneurially. She takes this into her work with customers. The combination of entrepreneurial understanding and versatile creativity is complimented by customers again and again.

The mission: to help clients say what they have to say, every day. Whether this involves web-sites, online stores, business coaching, content systems, texts or design is secondary. The goal is to help customers get forward with the right services.

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5.5 Publication concepts

A further orientation guide for the classification of web-to-publish systems with regard to the technical system concepts is the following structure:

- Template-based systems
- Document-based systems
- Automation-based systems
- Cross-linking-based systems

This categorization has its origin in the analysis of print-oriented output channels, but can also be transferred to the output of digital media. For example, templates can be based on InDesign, but also on HTML for the output of web pages or e-mail newsletters.

The term “document” covers both printed and digital editions or files. Individual systems can either be assigned to a single concept or to several. This results in meaningful application possibilities for the solutions.

Basically, all web-to-publish systems have a database basis. Due to the clear system separation of content and layout of a publication, content can be managed centrally and used multiple times for different media channels.

With the use of specialized databases, including media, product or text databases, cross-media channel access to the data is also possible.

5.5.1 Template-based systems

In the template-based system concept, designed templates are provided on the web server (Fig. 5.11). These templates contain both unchangeable design elements (such as a logo) and elements that can be changed by users. When a template is called, a copy, i.e. a document, is created. In this way, any number of users can call up and individualize a copy of this template.

Individualization can also be automated, for example by inserting address data from merchants by retrieving them from the master data of the users. The individualized template is either an advertising medium, such as an advertisement, or is linked to a promotional item, such as a ballpoint pen, and produced externally.

Variable templates

To control the “behavior” of the variable objects during user input, rules are added to the templates: For example, a text frame can “grow” to a maximum height as the amount of text increases and displace subsequent frames.

Some systems also allow you to assign different layout variants to a template. This allows users to switch from a two-column layout to a three-

column layout without having to open a new template.

The rules can either be directly linked to the template or defined in the user rights management. More complex rules can be implemented with the template-bound method than with the right-hand method.

Typical areas of application:

Advertising materials, such as flyers, posters, advertisements, mailings, promotional items or business prints, such as business cards, letterheads.

- Advertising media portals
- Marketing service portals
- B2C/B2B webshops for printed materials
- B2C webshops for consumer goods

See chapter “3.2 Areas of application” on page 56.

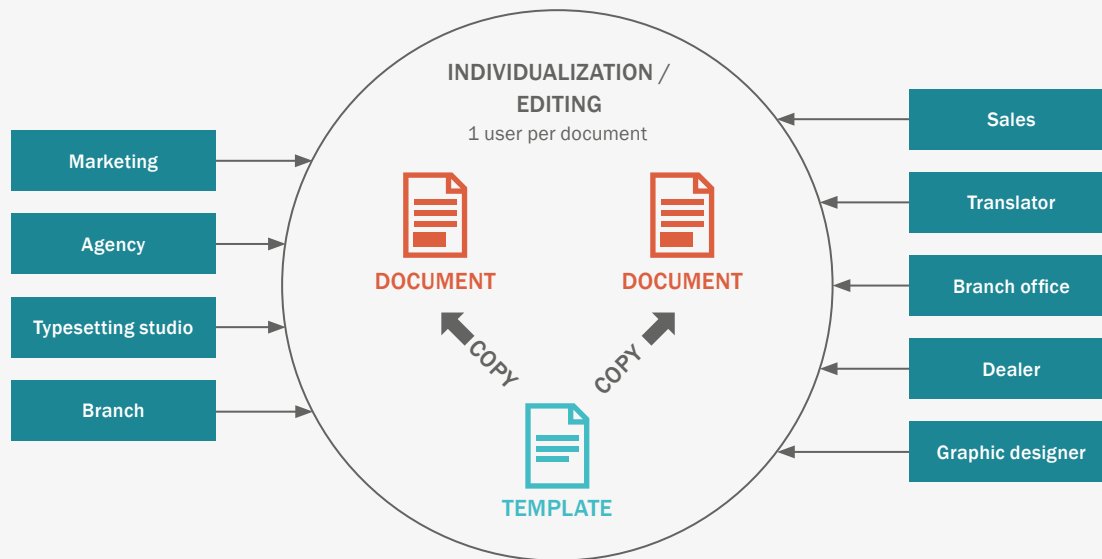


Fig. 5.11 Template-based system concept. © Melaschuk-Medien

5.5.2 Document-based systems

In the document-based system concept (Fig. 5.12), either pre-designed documents are made available on the web server and processed or individualized by several users simultaneously. Or parts of a document page, which can also be a website, are assembled in a kind of “modular system”. In both cases, user groups receive editing rights; for example, the marketing staff of a company may only change texts, but no images, or editors only have access to certain texts. These documents can also contain unchangeable corporate design elements and elements that can be edited.

From a technical point of view, it is possible, depending on the system, that a “working copy” of a source document must first be created.

For multilingual publications, one language version corresponds to one document copy. In contrast to the template-based approach, however, there is only one working document and several users can access it. Simultaneous editing by users can be possible within the document on different pages or at object level within a single page.



Fig. 5.12 Document-based system concept. © Melaschuk-Medien

Typical areas of application:

Product brochures (multilingual), editorial publications (also corporate publishing).

- Web content management systems
- Editorial platforms
- Translation portals

See chapter “3.2 Areas of application” on page 56.

5.5.3 Automation-based systems

With the automation-based system concept (Fig. 5.13), content is continuously maintained by several users in media, product or text data-bases on the web. At the same time, a template is created. This template can be a print layout template or an HTML template for a website. The design elements in the layout templates are linked once to the contents of the databases. The successive flow of the contents can either be done manually “at the push of a button” or permanently fully automated. The content can also be largely personalized so that a unique version is created for each output document.

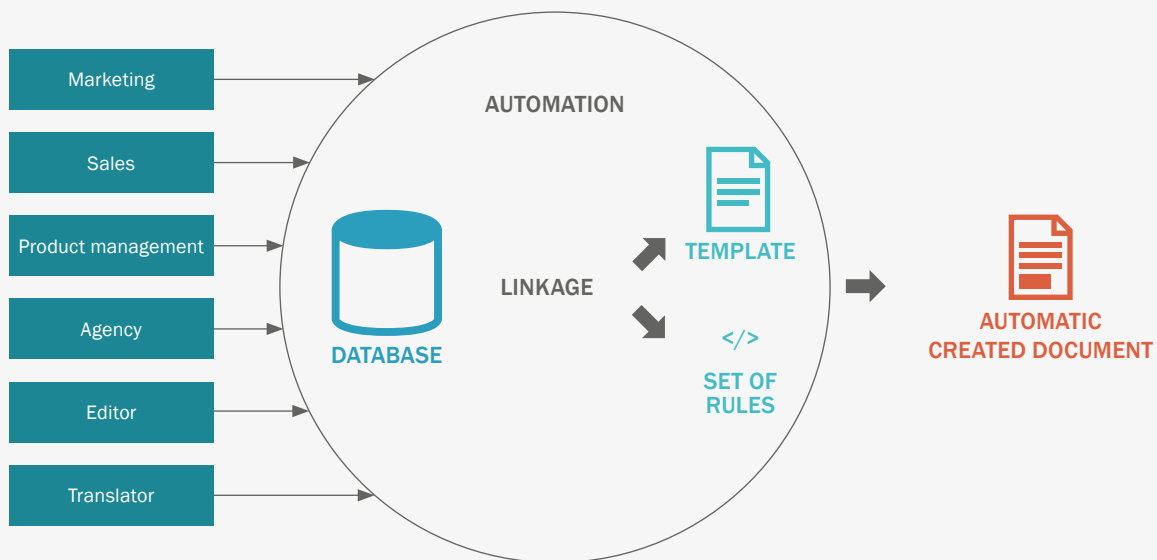


Fig. 5.13 Automation-based system concept. © Melaschuk-Medien

A semi-automated approach is possible by continuing to create the layout with the already integrated content in parallel to further database maintenance until the document is released for final output.

Automation-based systems in the print sector usually have sophisticated control functions so that the design elements fit in flexibly when the content flows into the layout templates and subsequent post-processing is kept to a minimum. A common term for this process is “database publishing”.

Typical areas of application:

Product catalogs, price lists, newspapers, magazines, mailings.

- Marketing automation, dialogue marketing
- Multi-channel content management systems

See chapter “3.2 Areas of application” on page 56.

5.5.4 Cross-linking based systems

The combination of media channels within cross-linking-based systems (Fig. 5.14) is becoming increasingly important, as there are more

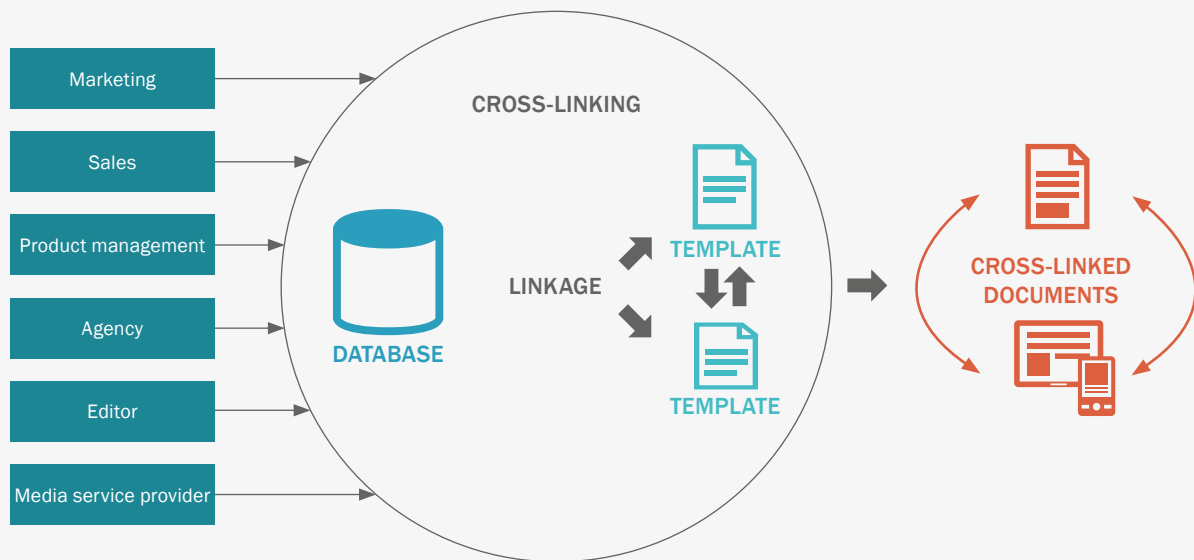


Fig. 5.14 Cross-linking-based system concept. © Melaschuk-Medien

PRODUCT TYPE	ADVERTISING MATERIAL	BUSINESS PRINTS	PUBLICATIONS
	Flyers, advertisements, posters, mailings, product sheets, web-sites, promotional items	Business cards, letterheads, envelopes, forms	Kataloge, Preislisten, Broschüren, Bücher, Zeitschriften
SYSTEM CONCEPT OF THE MEDIA PRODUCTION	TEMPLATE-BASED		DOCUMENT-BASED
	CROSS-LINKING-BASED		AUTOMATION-BASED
TYPICAL MANIFESTATIONS	Small number of pages Single documents Individualized advertising material Personalized serial documents		High number of pages Periodic documents Multilingual

Fig. 5.15 Print product types, system concepts and typical forms of appearance. © Melaschuk-Medien

and more channels and touchpoints on which consumers can be reached. In retail, for example, the individual media channels are increasingly interlinked in order to accompany recipients of advertising messages on their way to an action, such as purchase or request. These so-called “customer journeys” run along touch points at which interactions are possible or information or advertising messages can be placed.

Templates for print and digital advertising materials are linked with variable data from databases, such as recipient data, product and media data. The advertising media are also linked together to enhance the advertising effect and trigger actions such as filling out a web form. The link

to a landing page (website) is realized, for example, by means of personalized web addresses (PURLs). Typical scenarios from the automotive sector are online advertisements on the internet linked to the websites of local car dealers where test drives can be booked. The success of such a campaign is clearly measurable by the number of test drives booked.

However, the link between advertising activities is also made through “retargeting” by “recognizing” the user or user type on a social media platform and playing an ad.

Typical areas of application:

Cross-media campaigns consisting of print mailings, e-mail newsletters and landing pages.

- Marketing automation, dialogue marketing

See chapter “3.2 Areas of application” on page 56.

5.5.5 Interaction of the system concepts

The system concepts presented can also be used in combination (Fig. 5.16). For example, publications that are created based on documents or automation usually contain extensive content that must be managed on a database basis. In addition, there may be a need for individualized editions.

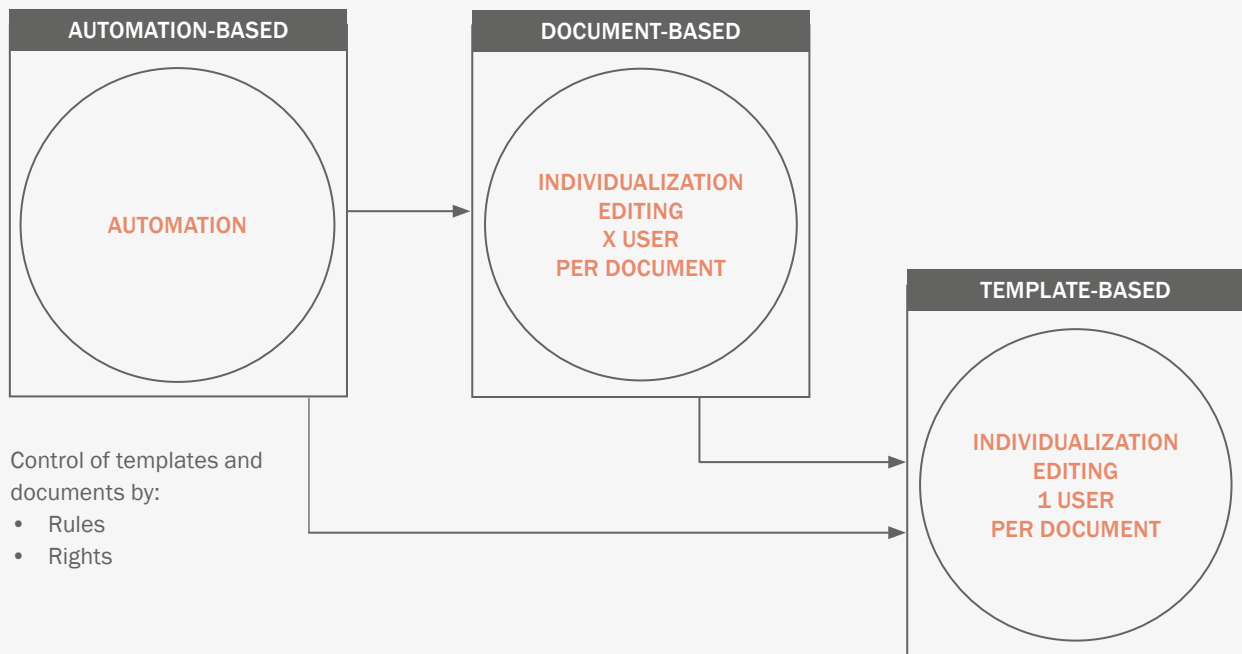


Fig. 5.16 Interaction of system concepts. © Melaschuk-Medien

Example

A franchise company with seminar offers creates a training catalog, which is available in different versions for each franchisee. The seminars are held by franchisees at different locations. The seminar offer is maintained in a database containing the seminar descriptions. The training catalog is created with the central contents from the database and made available to the franchisees on the web server, which can supplement individual event locations and dates. The training catalog including the individual data is issued.

It is also possible for a catalog to be created automatically with the use of a database (automation-based) and then finalized in a document-based manner by several participants, such as employees from marketing or the agency. As in the example above, this publication can then also be released for individualization, e.g. by dealers (template-based).

5.6 Example of a cross-media, data-base-driven media production process

Using an anonymous example based on a practical application, the basic processes of cross-media media production are shown, in which the media channels print, website and app are created (Fig. 5.17). The company is a manufacturer of household goods that sells its products in retail stores and department stores. The following requirements apply to media production:

- Once or twice a year a product catalog is created in several languages.
- Within the company website there is a web shop for end users.
- An app for tablet PCs is intended to provide sales staff with product presentation options and an ordering function.

The database basis

At the center of the web-to-publish system is a MAM (Media Asset Management) system for managing media objects, such as images or videos, and a product database, referred to here as PIM (Product Information Management), for managing product information. The information in the product database is transferred from the ERP (Enterprise Resource Planning) system and supplemented in the marketing department.

Within the scope of product selection, the products and features within the database are assigned to the respective channel – the print catalog, the website and the app. This assignment can be automatic, manual or semi-automatic.

Product data is often inserted several times in media channels as a result of the assignment; however, these are only “copies” that must not be changed. Changes are only allowed in the “source data”. The following descriptions of the steps refer to numbers 1-4 in Figure 5.17.

1: Media channel Print

The web-to-publish system contains an internal template editor that is used to create the “Layout Template Print”. The layout objects, in this example the “placeholders” for the product name, the product image and the article number, are placed on the page. If several products are to be displayed on one page, both product templates and page templates are created, which can contain several product templates.

A database field is assigned to each layout object. For example, the product name appears at the top of each catalog page.

The format definitions are also created in the form of style sheets. During the final document generation, the layout objects in the templates are linked to the assigned contents of the data-

base fields. Depending on the number of products, the document pages are generated, output as a PDF print file and forwarded to the print service provider.

2: Media channel Website

The product selection for the web shop forms the selection basis for the XML export.

This export data is used to transfer the content and structure of the product information to the Web Content Management System (CMS). Similar to the print media channel, the CMS contains HTML templates and format definitions in the form of Cascading Stylesheets (CSS), with which the XML export data is linked and prepared for online presentation.

This update of the product data in the web shop can be done automatically or manually, depending on the configuration. This means that the current product information is quickly available online in the web shop.

3: Media channel app

The product selection for the app is also defined via the XML export. Here, too, the transfer is carried out either automatically or manually to the web server on which the app is hosted. The app is linked to the product information and is therefore always available in a current version.

As soon as sales staff start the app, the data is automatically updated.

Products can be better explained via video presentation in the app and all color variants can be displayed in conjunction with the product at no extra cost.

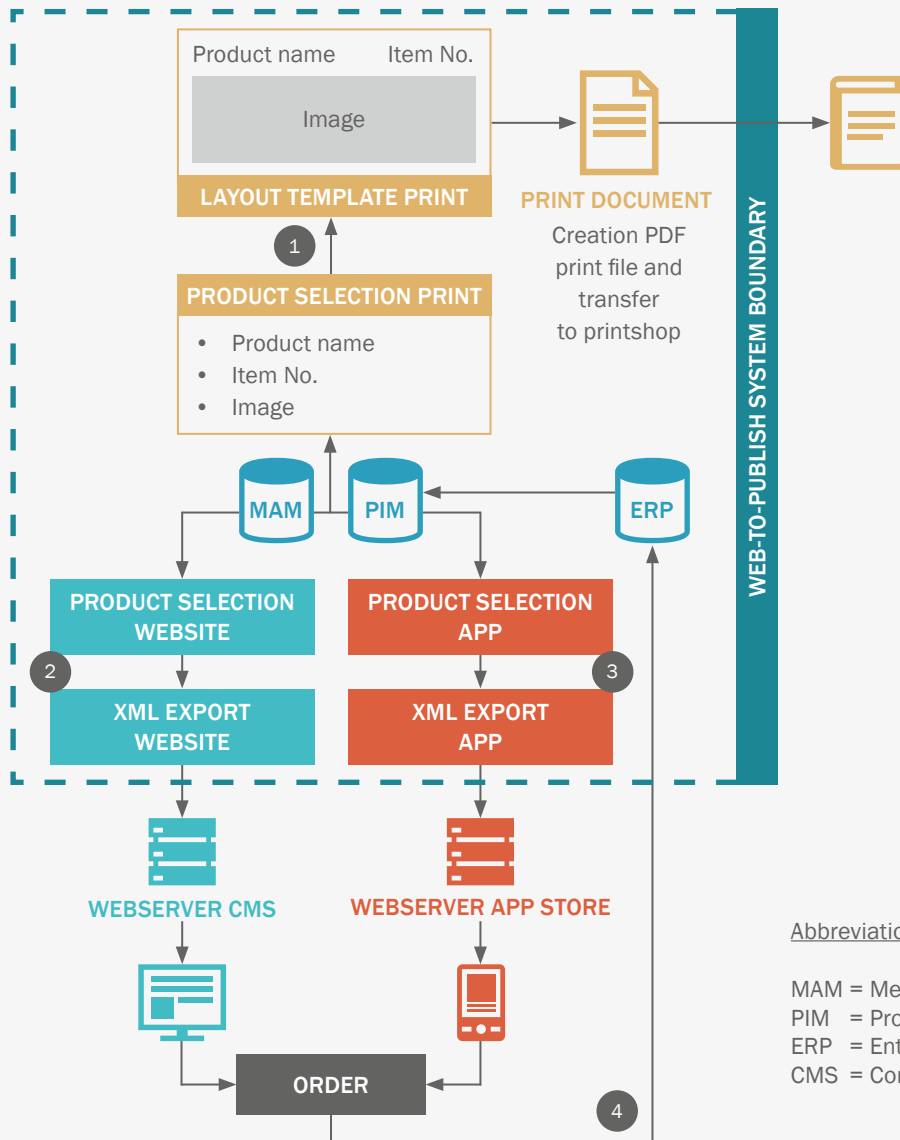
In the printed catalog, on the other hand, the presentation of color variants is associated with additional printing costs.

The sales staff can also use the app offline, so that there is no dependence on functioning internet connections.

4: Orders

Orders placed via the web shop or app are automatically transferred to the ERP system. The order function integrated into the app was a key motive for developing this media channel to relieve sales staff of time-consuming administrative tasks.

EXAMPLE OF A CROSS-MEDIA, DATABASE-DRIVEN MEDIA PRODUCTION PROCESS



Abbreviations:

MAM = Media Asset Management
PIM = Product Information Management
ERP = Enterprise Resource Planning
CMS = Content Management System

Fig. 5.17 Example of a cross-media media production. © Melaschuk-Medien

5.7 Marketing automation

A general definition describes marketing automation as “the IT-supported execution of repeated marketing tasks with the aim of increasing the efficiency of marketing processes and the effectiveness of marketing decisions.” (*Hannig 2021*).

This description applies to the most diverse areas of application described in this book, so that a delimitation of technologies and processes with the help of this definition is not expedient.

In fact, the term “marketing automation” has become established for a category of systems that Gartner defines as “multichannel marketing hubs” as technologies “that enable companies to orchestrate their communications and offerings to customer segments across multiple channels. These channels include websites, mobile apps, social media, direct mail, call centers, paid media and email. Multichannel marketing hubs can also integrate marketing offers/leads with sales in B2B and B2C environments.” (*Gartner 2021b*)

The data basis includes recipient and lead data, but also information from web stores, web analysis tools or internal databases and real-time data that is merged by means of customer profiles, segments or personas. Leads are contacts with people interested in products or services who provide the advertising company with their contact data for further interactions (*Wikipedia*

2022c). All this data is the basis for the personalization of advertising measures.

Accordingly, marketing automation systems mainly include digital advertising measures and print mailings that enable one-to-one personalization and are specifically geared to target groups or individual persons.

The various advertising measures in a campaign are coordinated with each other and frequently linked. The link is established, for example, by means of personalized web addresses (PURLs).

Other links between advertising measures can be established, for example, when web store visitors move to social media channels at other times and suitable ads are displayed there.

The execution and delivery of the personalized advertising material is automatic, as is the measurement of success.

The advertising materials usually contain interactive components that are intended to lead to actions or a dialog. This can include downloading a white paper or registering in a web form for an event.

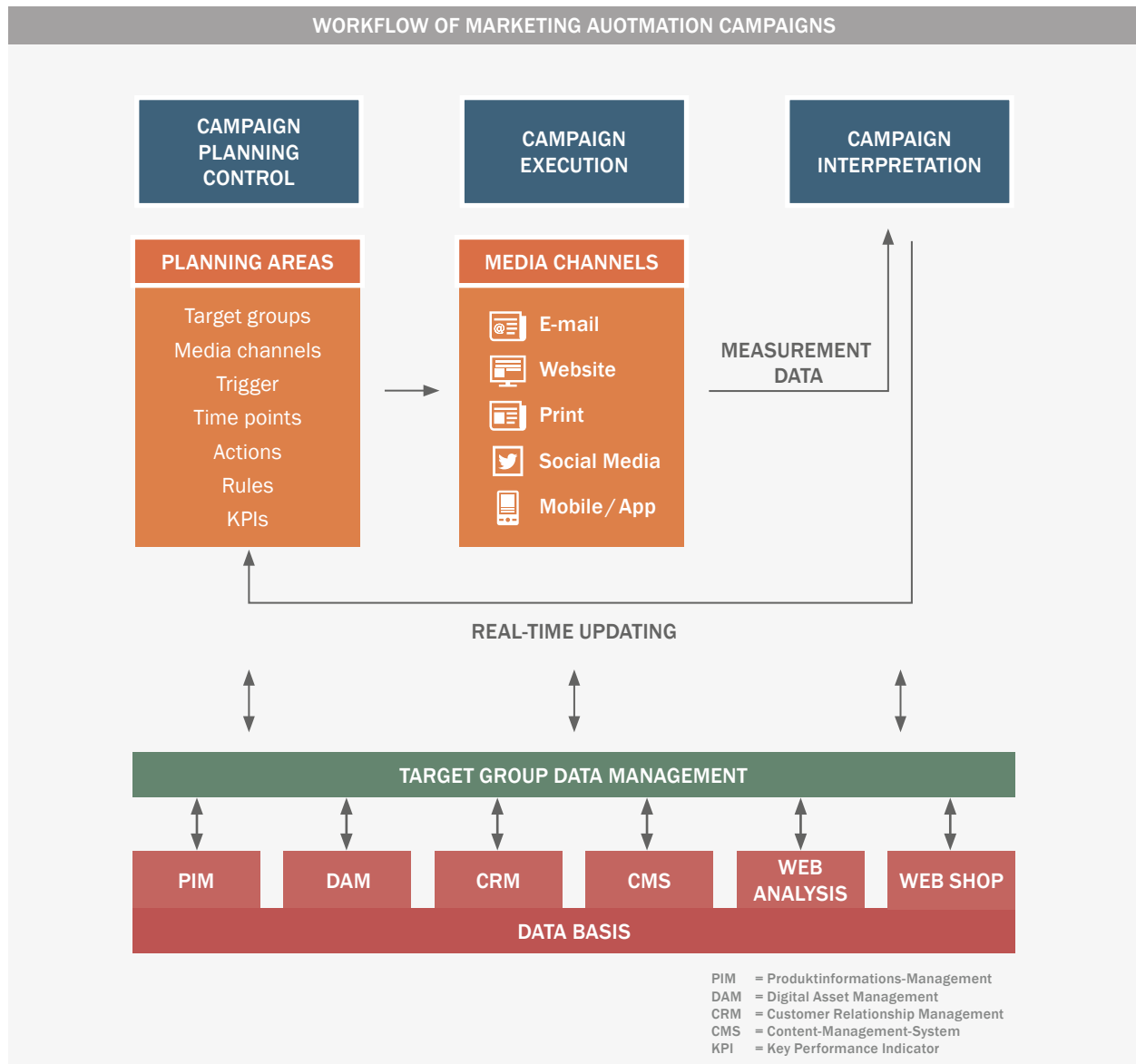


Fig. 5.18 Cross-media dialog marketing campaigns as a cycle with planning and control, implementation and evaluation.
© Melaschuk-Medien

Variable data such as recipient data, product and media data, PURLs (personalized URLs) are linked to the advertising media,

QR codes, geomaps (directions sketches, videos with simulated routes), image personalization or video personalization (Fig. 5.19). Print mailings can be highly personalized.

The results of the campaign success flow – in real time – back into the database and optimize follow-up campaigns.

In the ideal case, it is a closed loop that is planned, controlled and provided with rule-based automatisms in a workflow.

Workflow includes promotional activities, tasks, events (such as shopping cart abandonment, birthdays) or timelines.

One example is sending reminder emails when addressees have not triggered an action after a defined period of time.

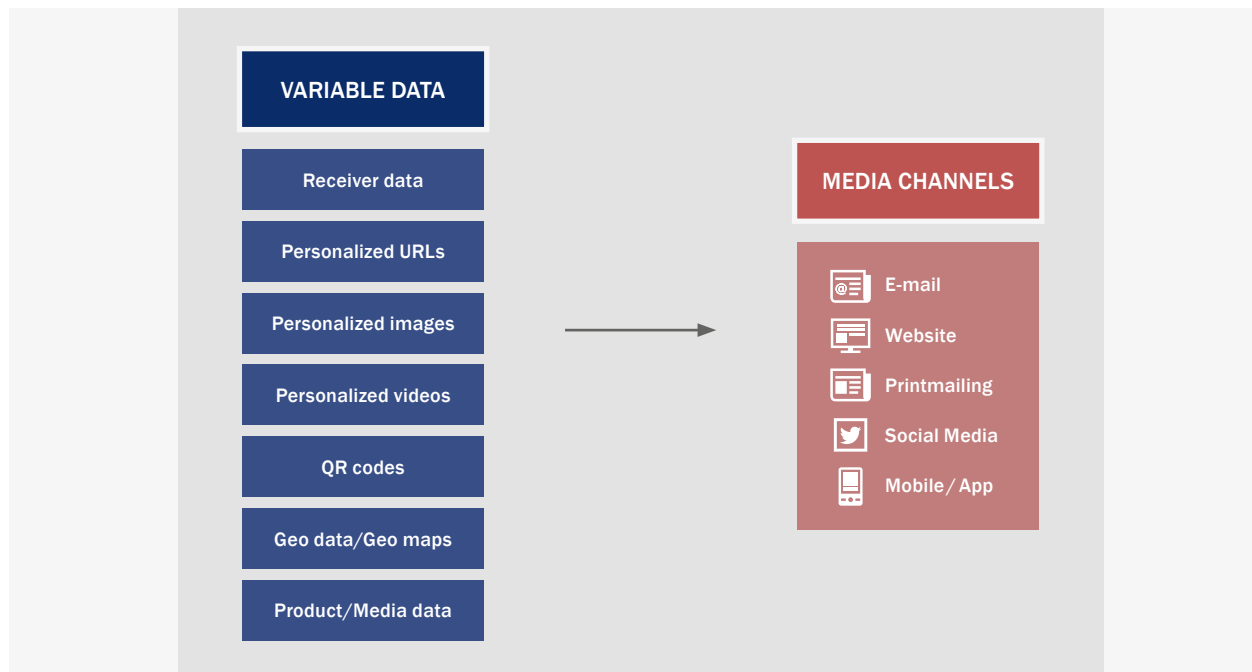


Fig. 5.19 Variable data for the personalization of dialog marketing campaigns. © Melaschuk-Medien

The following requirements are important for automated marketing campaigns:

- High-quality database (addresses, product data)
- Clear marketing strategy (goals, measures)
Attractive offers (incentives) and contents (relevance to the target group)
- Feedback (performance measurement) with reverse transfer (data optimization, sales support)

Campaign workflow

The course of a campaign is divided into the steps analysis and strategy, planning, campaign execution, measurement and evaluation (Fig. 5.18).

Analysis and Strategy

Market and data analyses as well as the definition of the campaign strategy are at the beginning of a dialog marketing campaign.

Targets can be:

- Lead generation
- Customer loyalty
- Activation of inactive regular customers
- Product sales and sales increase
- Information on new products
- Sales support
- Branding

Key performance indicators (KPIs) are derived from the objectives for subsequent measurement of success.

Planning and realization

The target groups, advertising media, content (like download documents), variable data, actions and times are planned and created within a planning tool in the system.

Also accompanying measures outside the system, like telephone marketing, press reports, blog contributions, television, radio and print advertising belong to the campaign preparation.

Campaign execution

Campaigns are executed automatically on a time-controlled basis and actions are changed or supplemented in real time as required.

Depending on the campaign rules, the main and follow-up actions (such as follow-up e-mails) are executed automatically.

Measurement and evaluation

Campaign data is measured and transmitted to the system. The database is supplemented if necessary and the results are visualized in diagrams and lists. The campaign data includes, for example, the click behaviour of the recipients or the number of purchase actions.

Main applications

The following describes typical areas of application for dialogue marketing campaigns with exemplary objectives and campaign elements. As a rule, these are multi-level campaigns in which several actions are executed in parallel or consecutively in a defined time-controlled sequence.

New customer acquisition and existing customer care

Targets:

Winning new customers, retaining customers to increase product sales, increasing newsletter opening rates, taking advantage of discount promotions.

Campaign elements:

1. Sending personalized e-mails, newsletters or print mailings with an invitation to visit a website with a special offer (landing page). Content and incentives are individualized offers, test products, gifts, discount campaigns or vouchers, which can vary based on the recipient profiles (such as higher discounts for recipients who have been inactive for a longer period of time).
2. On the landing page, the updated recipient data is entered for retrieving offers, gifts or participation in surveys.
3. Sending reminders and postcards to non-respondents.
4. Send a thank-you letter by post or e-mail.

Increase of purchase transactions and turnover

Targets:

Motivate potential buyers in the online shop to close broken shopping baskets, reactivate inactive existing customers, more purchase actions after the creation of offers and shopping baskets.

Campaign elements:

1. Sending personalized e-mails with individual customer approach based on recipient and shop transaction data, also in connection with a voucher campaign.
2. Reminder mailings with selected offers, product recommendations (e.g. based on the products in the cancelled shopping basket) and coupon codes.

Event management

Targets:

Increase the number of participants for events, e.g. reaching high numbers of visitors at a fair or a roadshow.

Campaign elements:

1. Send a personalized print mailing and emails with an offer for a free ticket including registration code. The mailing contains a personalized URL and a personalized QR code whose link targets lead to a landing page with registration form.

2. Recipients register via a registration form on the landing page with recommendation function on social media channels.
3. Confirmation e-mail that enables the log-in data for the event ticket shop and the ticket download.
4. Vouchers can be exchanged or gifts collected on the day of the event.
5. Reminder mail or postcard for non-responders.
6. After the event: Sending e-mails or print mailings with an event review.

Outlook

Marketing automation campaigns are part of marketing and sales activities that are currently often carried out in isolation from other marketing systems or advertising measures in terms of system technology and organisation.

The “minimum basis” here is print and e-mail newsletter marketing. However, establishing a technical level of target group data management, linking it to content and advertising materials, and installing a “closed loop system” that feeds usage data back into the database is still a major challenge in many companies.

5.8 Print technologies

5.8.1 Programmatic Printing

Programmatic printing is a procedure for the database-based, automated creation and distribution of highly personalized or target group-specific print documents, such as mailings or catalogs. Mailings can be addressed (dialogue mail), partially addressed or unaddressed via household distribution. Catalogs usually reach recipients via direct delivery or as an attachment in a parcel shipment.

Production is usually triggered by an occasion, for example a shopping cart abandonment or a booking.

Print production is done in digital printing and each page of a print document can be composed of different content and layout modules. The data comes from product, media or customer databases, such as addresses, article numbers, prices or images. Other data sources include merchandise management, booking and customer loyalty systems.

There are basically two production routes:

- Generation of print documents on the basis of sets of rules.
- Generation of print documents on the basis of templates.

Generation of print documents on the basis of sets of rules

When generating print documents based on sets of rules, layout templates are not used. The input data is combined with a set of rules, which can be XML-based, and the output documents are generated fully automatically. The set of rules has the task of implementing all necessary layout optimizations and can control these very flexibly. It is used for documents with a very high degree of complexity. The rule sets are mostly created and adapted by the software providers.

Generation of print documents based on templates

When generating print documents based on templates, layout templates are used to connect to the input data. It is possible to differentiate between static and dynamic layout templates. In static templates, only the contents of the layout objects, such as text and image frames, are variable, but not the position or number.

In dynamic templates, the position of the layout objects varies depending on the target group parameters, for example, products with a higher purchase probability are placed in the front section of a catalog, while lower-weighted products are placed on the back pages. The number of pages can also vary depending on the content. The prerequisites are modular layout templates and sophisticated rule logics linked to the layout

objects. Layout template editing can be performed by technically skilled and trained users.

Both processes, the rules-based and the template-based generation of print documents, can also be combined. In this case, documents are generated fully automatically via sets of rules and these are stored as a template basis on a web-to-print platform. Company branches then use these to produce individualized print documents.

Examples of variable content:

- Recipient data
- Products, texts and images suitable for a specific customer or customer segment (age, gender, preferences, brand affinity), in connection with a booking or product recommendation.
- Coupons and vouchers for promotions.
- Product recommendations
- Information depending on the order method (postal, telephone, online).
- Vouchers or payment options depending on creditworthiness and payment behavior.

Through integration into marketing portals or marketing automation campaign systems, Programmatic Printing is an output channel that can be triggered within a campaign workflow by specific occasions, such as abandoned shopping carts, birthdays or new customer greetings. In conjunction with “media bridges” to digital offerings, such as PURLs (Personalized URLs) or

QR codes, high advertising effectiveness can be reached.

Features and effects of personalized print products:

- The delivery of print mailings to recipients does not require consent, but there is a right to contradict.
- Addressed advertising mailings are viewed from time to time by 82 percent of recipients (*Deutsche Post 2021*).
- Online stores achieve 20 percent higher shopping cart values with fully addressed print mailings than with partially addressed advertising mailings (*CMC 2021*).
- Print catalogs are regarded positively in households: around 70 percent of respondents rate catalogs as useful or inspirational (*Deutsche Post 2021*).
- Coupons and product samples are particularly effective forms of advertising: almost 90 percent of consumers use coupons and 85 percent buy the product after receiving a product sample. In fact, however, these effective forms of advertising are used too little by advertisers (*Deutsche Post 2021*).
- Print mailings can be used to attract additional attention, for example by using varnishing or die-cutting effects, enclosures such as stickers, parking discs or product samples.

Ultimately, the best advertising effectiveness is achieved by thoughtfully combining print and digital in advertising campaigns.

The promotion of Programmatic Printing is pursued by the organization “Programmatic Print Alliance – PPA (*PPA 2022*)”.

See chapter “5.7 Marketing automation” on page 126.

5.8.2 Process variants based on InDesign

In practice, the processes involved in print production are often of particular importance. These include aspects of layout program integration (such as Adobe InDesign) and the associated layout control, the extent of standardization and the degree of automation in the creation of publications.

The following process variants, which can also be implemented combined in systems, take into account scenarios with and without a publishing server. In the following, we will refer to “InDesign Server” as the most common type of publishing server on the market. Alternatively, publishing servers from Pageflex or Quark are used.

The processes of template preparation (template creation), where publications can be enriched with rules or controlled by means of rights management, are not considered here in order to keep the illustrations manageable. The methods of template preparation are diverse and range from plug-ins for InDesign or Adobe Acrobat to system-internal, web-based tools.

Process variant 1:

Print creation based on InDesign templates

In the process variant based on InDesign templates (Fig. 5.20), customizable InDesign documents are provided as templates in the system on the web server. If the template is changed, the document must be transferred to the system again. Depending on the system, changes already made may be lost. This depends on the extent to which an internal system separation of content, structure and layout is implemented.

Content can be automated or manually linked to the template, depending on system functionality. In principle, a high degree of automation is possible. It depends on the degree of media-neutral management of content and system functions whether content from a template can be written back into the databases.

The following options result from the integration of the InDesign Server:

- Users can call up a system internal binding preview at any time.
- Optionally, the InDesign template or document can be extracted from the system and post-processed in an InDesign desktop version if the system’s internal functions are not sufficient. In this case, the print PDF file is created in the InDesign desktop version and not via InDesign Server in the system.

Areas of application

The option of final InDesign post-processing in conjunction with translation processes is a common reason for using this system concept.

See also chapter “5.5.2 Document-based systems” on page 117.

Process variant 2:

Print creation on InDesign document basis

This process variant (Fig. 5.21) includes customizable InDesign documents that are made available in the system on the web server. The document can be fully edited in the InDesign desktop version and retransmitted to the system in an updated version. Depending on the system, this requires a separate check-in or

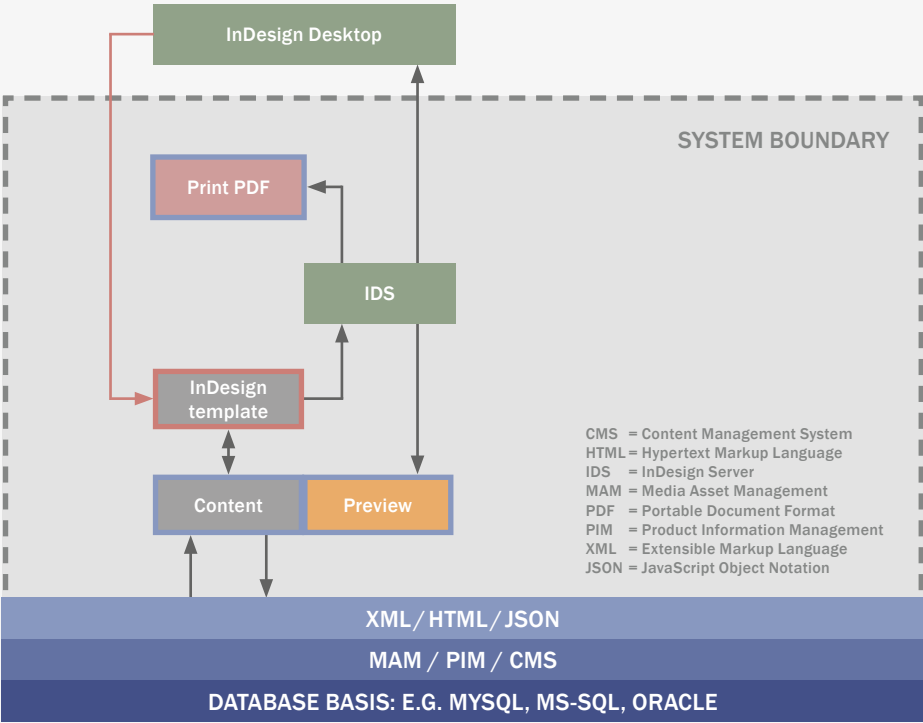


Fig. 5.20 Print process variant (1) based on InDesign templates. © Melaschuk-Medien

check-out process and users are informed of layout geometry or content changes. This makes it possible to practice parallel content and layout creation processes.

By integrating the InDesign Server, users can call up a system-internal, binding preview at any time.

Areas of application

This process is particularly suitable for collaborative projects in media production, such as

magazines, periodicals or publications in the field of corporate publishing.

See also chapter “5.5.2 Document-based systems” on page 117.

Process variant 3:

Print creation based on XML, IDML templates

In the process variant based on XML or IDML templates (Fig. 5.22), customizable InDesign documents are exported in XML or IDML data

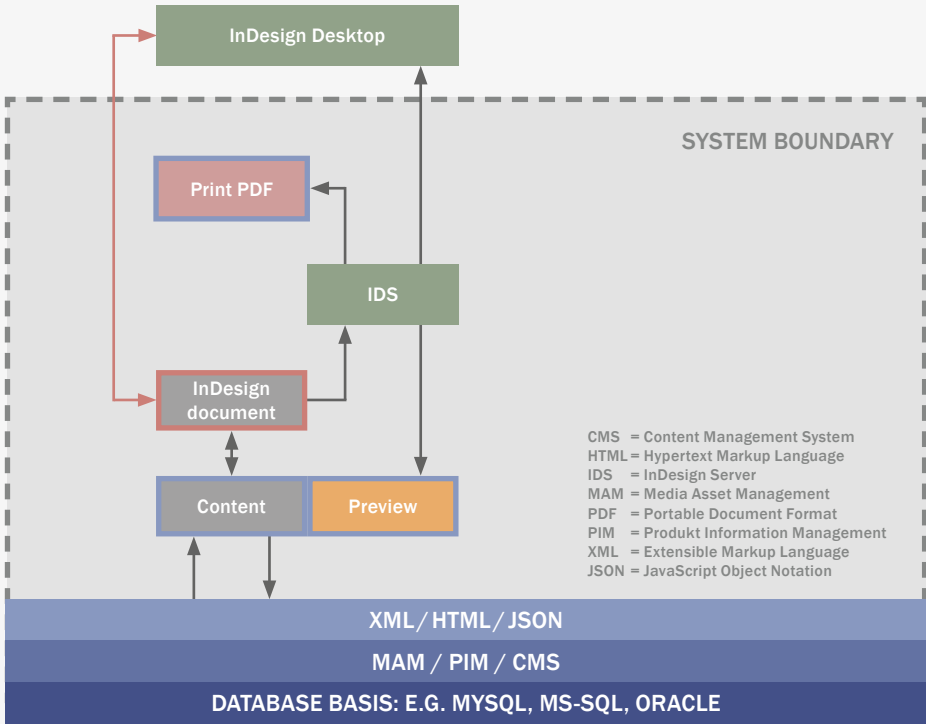


Fig. 5.21 Print process variant (2) based on InDesign documents. © Melaschuk-Medien

format and made available on the web server as templates. Alternatively, there are systems with which XML-based templates can be designed directly in the system.

Changes in the template are made internally or the XML or IDML data is transferred to the InDesign desktop system again and also transferred back again. In individual cases, data may be lost, especially when XML data is converted. For this reason, it makes sense not to transfer

the document back into the system after it has been exported to InDesign and to create the print PDF in the Desktop InDesign version.

Content can be automated or manually linked to the template, depending on system functionality. In principle, a high degree of automation is possible. It also depends on the degree of media-neutral administration of the content and the system functions whether content from a template can be written back to the databases

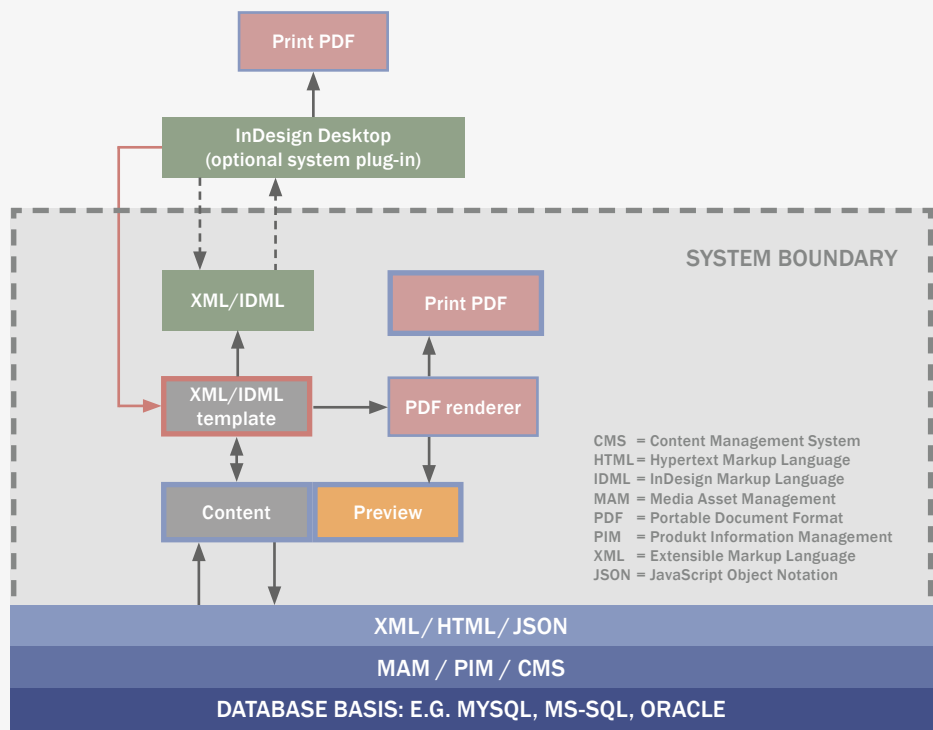


Fig. 5.22 Print process variant (3) based on XML or IDML templates. © Melaschuk-Medien

(see chapter “4.5 Media-neutral data management” on page 87).

A PDF renderer (like PDFlib, iText) is used to render preview and print PDF files.

Areas of application

This process variant is suitable for a wide range of applications, such as collaborative,

template-based, but also automation projects in which the layout of the documents is largely standardized and extraction to InDesign is only necessary on a case by case basis.

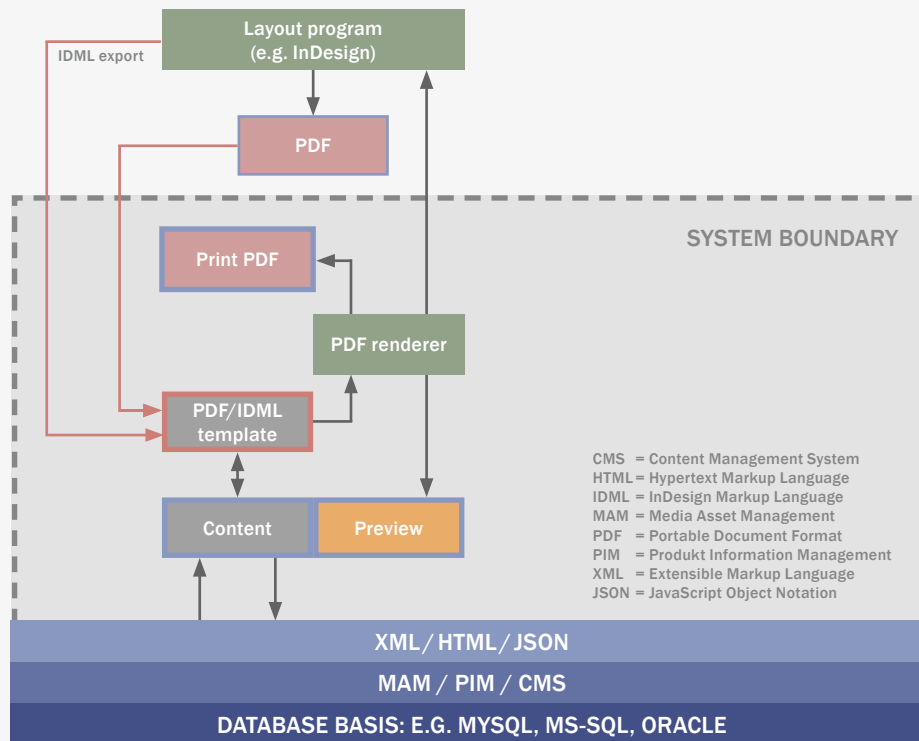


Fig. 5.23 Print process variant (4) based on PDF or IDML templates. © Melaschuk-Medien

Process variant 4:**Print creation based on PDF, IDML templates**

When using this process variant (Fig. 5.24), customizable PDF or IDML documents are provided as a template basis in the system on the web server. If the template is changed, the document must be transferred to the system again and any changes already made are lost.

Content can be automatically or manually linked to the template depending on the system function. In principle, a high degree of automation is possible, but this is limited to comprehensively standardized publications, as possibilities for post-processing are limited in the layout. It depends on the degree of media-neutral administration of the content and the system functions whether content from a template can be written back into the databases.

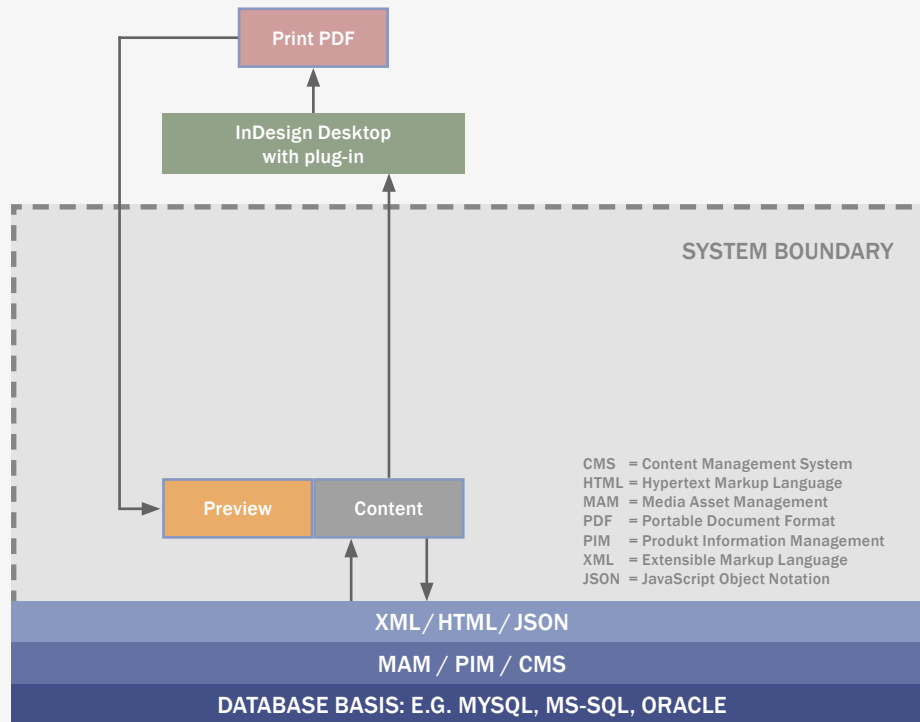


Fig. 5.24 Print process variant (5) with InDesign plug-in. © Melaschuk-Medien

A PDF renderer (such as PDFlib, iText) is also used to render the preview and print PDF files.

Areas of application

This process variant is mainly used for the individualization of advertising materials and promotional items as well as for the fully automated creation of standardized publications, such as price lists or catalogs.

See also chapter “5.5.1 Template-based systems” on page 115 and chapter “5.5.3 Automation-based systems” on page 118.

Process variant 5:

Print creation with Indesign plug-in

In this process variant (Fig. 5.24), InDesign documents are created in an InDesign desktop version and are given access to the database contents via a system plug-in for InDesign. The database contents are linked to the layout elements in InDesign. Content changes can be updated “at the push of a button” in the InDesign document.

This allows largely automated print productions in conjunction with the extensive option for local layout editing. Depending on the system, content can also be played back via the plug-in.

WORKFLOW VARIANT PRINT CREATION	1 INDESIGN TEMPLATE BASE	2 INDESIGN- DOCUMENT BASE	3 XML/IDML TEMPLATE BASE	4 PDF/IDML TEMPLATE BASE	5 INDESIGN- PLUG-IN
SYSTEM CONCEPT	Template-based Automation-based	Document-based	Template-based Document-based Automation-based	Template-based Automation-based	Automation-based
TEMPLATE FORMAT	InDesign	InDesign	XML or IDML	PDF or IDML	InDesign
CENTRAL RENDER ENGINE	InDesign server	InDesign server	PDF	PDF	None
OUTPUT IN INDESIGN DESKTOP VERSION	Yes, native	Yes, native	Yes, after conversion	No	Not relevant

Tab. 5.1 Comparison of the print process variants. © Melaschuk-Medien

In the (database) system, there is no central access to the layout document and no binding preview. A PDF preview can be created in the InDesign desktop version and made available in the system to allow system users to view the current status of the layout document.

Areas of application

This process variant is used if the layout creation is largely standardized and can be automated or decentralized layout processing is possible.

See also chapter “5.5.3 Automation-based systems” on page 118.

Table 5.1 compares the differences of the presented process variants.

5.8.3 Web-to-Print

Web-to-print refers to production processes for the internet-based transmission or creation of printed matter.

The print products that are created, processed or commissioned by means of web-to-print are usually standardized – in terms of paper format, number of colors, page count or design. In addition to standardization, other important features of web-to-print are user operation via web browser and the automation of workflows.

The following web-to-print production routes (Fig. 5.25) can be differentiated, which include template-, document- and database-based system concepts.

Transmitting ready print files

Print documents are created using graphics or design programs (such as Adobe InDesign, QuarkXPress, Adobe Illustrator) and saved as PDF files.

These PDF files must contain settings that meet the qualitative requirements of the subsequent printing process (such as sufficiently high image resolution, font size). The PDF file is uploaded to the web server in a web-to-print portal and from there is processed in further production steps up to the printing process.

Individualization of print templates

Templates are files that are stored on the central web server of a web-to-print system. The templates contain unchangeable (static) and changeable (customizable) elements and must be prepared beforehand in a separate step in a way that is compatible with the system.

The users of a web-to-print system call up the templates in the web application to individualize or personalize them (for serial documents). The results can be checked by the user during processing and before the final order in a preview view that is generated on the web server. The final document version is finally converted into a PDF print file on the web server and processed in further production steps until the printing process is complete.

Print on demand

When retrieving printed materials via a web portal, a distinction is made between “print on demand” (POD), where printed materials are only printed on request (order). On the other hand, a web portal can be used to order printed matter that has already been pre-produced and can be retrieved from a warehouse stock.

Cooperative creation of print documents

Print documents are created cooperatively if they are provided centrally on a web server and, using the functionality of a web-to-print system, are

created, edited or commented on cooperatively by several users for the purpose of correction.

Automatic creation of print documents

For the automated creation of a print document (like a product catalog) a print template with layout objects (text, image) is first created. In the next step, the individual layout objects of the print template (a product heading) are linked to the structure elements of a data source, such as a product database. A data structure element (product description) is assigned to each layout object of the template (product heading). Finally, the print document is created in which the print template is automatically merged with the contents of the data source. A common, synonymously used term for this production method is “database publishing”.

Examples for Web-to-Print applications

- Open print shops for standard printed materials, such as business cards or flyers, with calculation, ordering and uploading of finished print files.
- Advertising material portals of industrial companies whose branches or subsidiaries can access, individualize and order central corporate design-compliant advertising material templates via log-in.
- Creating editorial products, such as newspapers or magazines, in which several text

and image editors and layout designers work together on a document.

- Translation of a product brochure into several languages, whereby the language documents are provided centrally and translated by the translators in the countries. The translators have layout control in an updatable preview.
- Creation of an extensive product catalog with several hundred pages based on product data managed by product information management.

This section “Web-to-Print” is part of the article “Web-to-Print” on Wikipedia.de, which was initially posted by the author Ira Melaschuk (*Wikipedia 2020*).

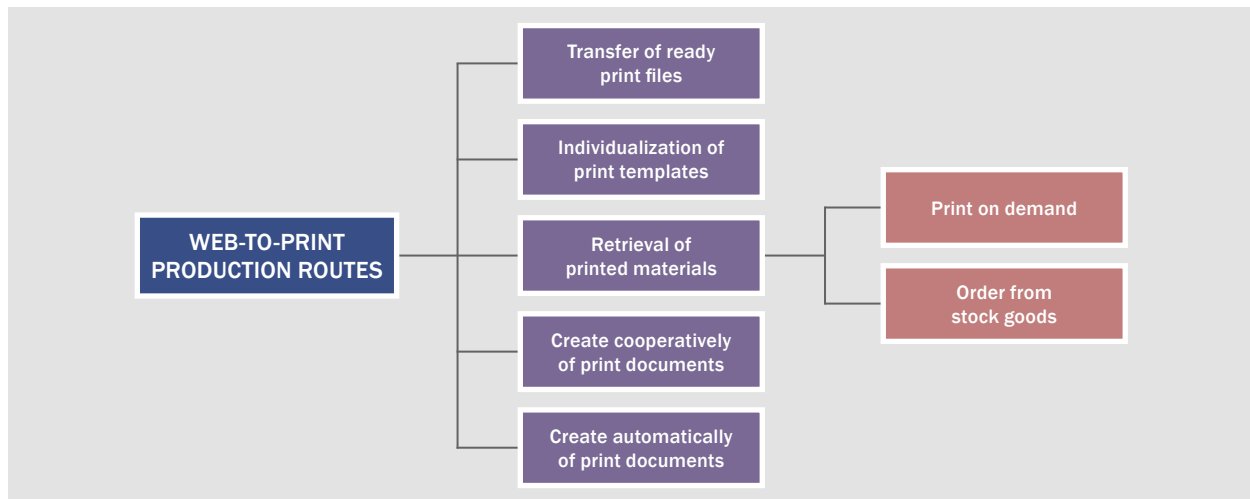


Fig. 5.25 Production routes in web-to-print systems can be implemented individually or combined. © Melaschuk-Medien

5.8.4 PrintCSS

PrintCSS is based on the W3C standard “CSS Paged Media Module” (*W3C 2018*) and is a method for automatically generating PDF documents from HTML or XML data using CSS (Cascading Stylesheets). The formatting and layout information is stored in the CSS. CSS are usually used for formatting web pages, in PrintCSS print-specific parameters are added to output margins, headers and footers or page numbering. A renderer, such as Antenna House, is used for PDF generation.

PrintCSS technology is already in use, especially in the publishing sector, although there is still potential for development that would make it possible for non-programmers to use it.

6 COMMUNICATION CHANNELS

SUMMARY

The term communication channels is used in this chapter as a generic title for advertising media and media channels. In a tabular overview, separated into print and digital, advertising media are assigned to the media channels for which they can be used.

These tables can be used by marketing strategists during planning because they show which advertising media can only be used in one or more media channels.

Individual media channels and advertising media are then viewed separately – in terms of content, technologies, market relevance and trends. The market observations in this chapter relate primarily to the German or German-speaking market. This information can be used to evaluate existing or planned communication channels and integrate them into the marketing strategy.

6.1 Overview and trends

The diversity of media channels continues to increase, especially in the digital sector, and in many cases leads to technically and organizationally independent production processes. An example of this are e-mail campaigns, which are implemented as an important marketing instrument as standard, but in companies often by using stand-alone solutions.

In future, however, largely automated planning and control of the entire media mix will be required. For example, the share of digital advertising in the total budget of the Volkswagen Group is expected to approach 50 percent, as marketing manager Jochen Sengpiehl explained in an interview with the magazine HORIZONT (*Scharrer 2019*).

Media channels and advertising media in the market overview Web-to-Publish systems

The interactive market overview Web-to-Publish systems of Melaschuk-Medien is updated annually by the providers. The diagram (Fig. 6.1) shows the evaluation of the results from the update of the market overview Web-to-Publish at the beginning of 2022 compared to the corresponding data from 2019.

Some digital communication channels show relatively high growth rates, such as online/mobile (up 16 percentage points), office

applications (up 13 percentage points), video/audio (up 5 percentage points) and search engines (up 4 percentage points).

Data for media channels that are supported by internal functions in the systems (in contrast to media channels generated) were taken into account.

The following overviews (Tab. 6.1 and 6.2) connect printed and digital advertising media to the media channels and thus provide an overview of the respective application spectrum.

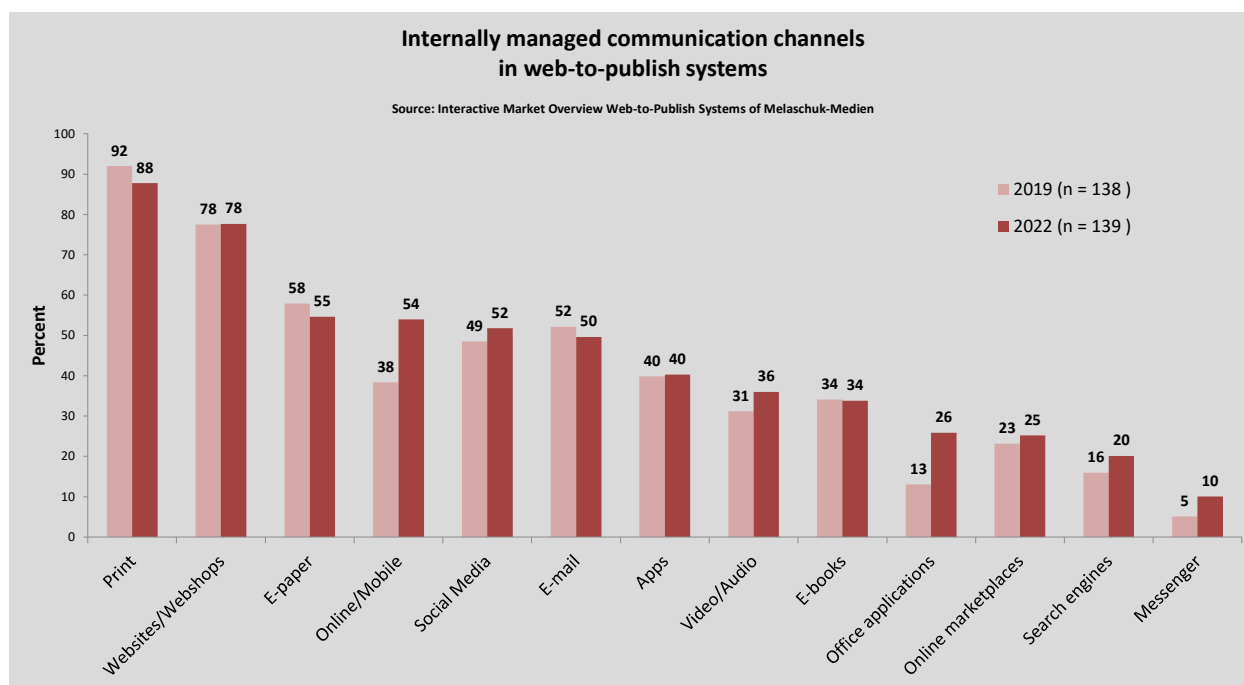


Fig. 6.1 Communication channels supported internally in web-to-publish systems. Data from the market overview Web-to-Publish 2019 and 2022, version in German, comparison (Status: 25.02.2022). © Melaschuk-Medien

Media channels Ad material print	One-to-One marketing Home	Point of Sale (POS)	News- paper Magazine	Out-of- Home	Internet Web- shop Online market place	Mobile Apps	Social Media	Cinema TV Radio Audio portals	Internet of Things
Flyers, leaflets, brochures	✓	✓	✓						
Business cards, letterheads, envelopes, folders	✓	✓							
Coupons, discount cards	✓	✓	✓						
Posters, billboards, large format prints		✓		✓					
Brochures, catalogues, price lists, books, instruction manuals	✓	✓							
Whitepapers, presentations, studies	✓	✓	✓						
Packaging, labels, stickers	✓	✓							
Flags, roll-ups, beach flags, displays, signs		✓		✓					
Vehicle signage				✓					
Print ads			✓						
Mailing	✓								
Promotional items	✓	✓							
Indoor furnishing, event objects		✓		✓					✓

Tab. 6.1 Overview of typical print advertising media and their use in single or multiple media channels.
© Melaschuk-Medien

Media channels Ad material digital	One-to-One marketing Home	Point of Sale (POS)	News-paper Magazine	Out-of-Home	Internet Web-shop Online market place	Mobile Apps	Social Media	Cinema TV Radio Audio portals	Internet of Things
Brochures, catalogues, price lists, books, instruction manuals	✓	✓	✓		✓	✓	✓		✓
Whitepapers, presentations, studies	✓	✓		✓	✓		✓		
Search engines, online directories entries and advertising					✓	✓			
Online ads (web, social media)					✓	✓	✓		
Messenger ads					✓	✓	✓		
Social media profiles and posting					✓	✓	✓		✓
Website, blog, microsite, landing-page					✓	✓	✓		✓
Online-newsletter (e-mail, messenger, app push notifications)	✓				✓	✓			✓
Community, chatroom, forum	✓				✓	✓	✓		
Video spot, slideshow, Infographic, 360-degree panorama image		✓	✓	✓	✓	✓	✓	✓	✓
Digital signage, POS-TV		✓		✓					✓
Cinema, radio, TV spot	✓	✓		✓	✓	✓	✓	✓	
Skill, podcast, audio spot	✓	✓			✓	✓		✓	✓
Augmented reality, virtual reality	✓	✓	✓	✓	✓	✓	✓	✓	✓

Tab. 6.2 Overview of typical digital advertising media and their use in single or multiple media channels.

© Melaschuk-Medien

6.2 Print

For some years now, the printing industry has been exposed to sustained strong competition in an international market, monopolization by “printing factories” and shifts in advertising budgets from print to digital. Print’s share of total advertising media in 2020 was around 31 percent of total net sales, three percentage points lower than in the previous year (*ZAW 2021a*). According to calculations by the Bundesverband Druck und Medien e. V. (German Printing and Media Industries Federation), production values in the first quarter of 2021 for print products and print services fell by 14.4 percent down compared to the previous year (*BVDM 2021*).

Opportunities through digital printing and automation

The former mass production of printed matter is increasingly being replaced by individualized, target group-oriented small and very small print runs that can be realized with digital printing “*6.5 One-to-one communication*” on page 152. For many companies, this supports the optimization of business processes by no longer storing large quantities of printed matter, but producing and delivering it on demand. This reduces storage costs and ensures that print products are always up to date.

In connection with automated, database-driven production, “Programmatic Printing” plays a

particularly important role here, enabling highly personalized print products to be output.

Print with bridge technologies

Another trend is the combination of print products with elements that link to digital offerings, such as URLs to landing pages, QR codes, wireless technologies such as NFC and augmented reality technologies. This makes the use of print measurable and makes it easier to document the advertising impact. *See also chapter “6.10 Mobile” on page 158.*

One speaks of web-to-print systems when the media channel print is almost exclusively supported in web shops (*Wikipedia 2020*). *See chapter “5.8.3 Web-to-Print” on page 141.*

6.3 Online platforms, websites and apps

The importance of the internet for society and the economy continues to grow: According to the ARD/ZDF online study, 94 percent of the German-speaking population aged 14 and over are now online. Mobile internet use has also risen sharply: 79 percent of Germans access the Internet at least occasionally while on the move, among the 14- to 29-year-olds, the figure is 97 percent (*ARD/ZDF 2021*).

Online platforms as advertising media

Web-to-publish systems are in themselves web platforms for the creation, processing, adminis-

tration and distribution of advertising materials and documents. However, if the media channels website or web shop are mentioned, they fulfil the function of advertising media, such as trading platforms or publishing websites, on which advertising can be placed. To this end, AGOF (Arbeitsgemeinschaft Online-Forschung – Online Research Group) lists 376 website offerings, 213 mobile-enabled website offerings, and 185 app offerings as advertising media with performance data (*AGOF 2021*).

The importance of search engines as an advertising medium is also important, as the occasional or frequent use of search engines within internet use is in first place with around 93 percent (*AGOF 2021a*).

Online advertisements

Online advertisements are published on highly frequented websites, trading platforms, social media channels, within messengers, in mobile apps or in the digital out-of-home (DOOH) sector. The term “display advertising” is also commonly used to distinguish it from more text-oriented forms of advertising, such as in search engine marketing. Gross advertising expenditure for online advertising reached a plus of 6,5 percent in 2021 compared to the previous year. (*Nielsen 2021*).

Apps

The term “app” is usually used for application programs that are used on mobile devices such as smartphones and tablet PCs.

Revenues and download figures in the Apple and Google app stores are at a consistently high level. Of the more than 3.3 billion downloads in 2021, Google’s Play Store accounted for 2.5 billion and Apple’s App Store for 786 million (*BITKOM 2021*).

Technical variants

The technical app variants include native apps, web apps and hybrid apps.

Recent developments that support increasing mobile internet use include Accelerated Mobile Pages (AMP) and Progressive Web Apps (PWA).

Native apps are programmed for a specific operating system, such as Google’s Android or Apple’s iOS. The app must be installed on the mobile device. The development effort is particularly high if an app is to be made available for different operating systems. The reasons for using native apps so far have been the use of device functions such as camera or location detection and high demands on design, usability or performance.

Web apps are created using web technologies (HTML, CSS, JavaScript) and can be accessed

via URL links in web browsers. The high degree of coverage of operating systems and end devices as well as the relatively cost-effective development speak in favour of web apps. However, the use of device functions such as camera, telephony or location data is not self-evident.

So-called hybrid apps, in which only a single app is programmed and certain functions, such as access to device functions, are programmed natively, provide a solution. Therefore the development is simplified and usually cheaper.

The technologies around AMP and PWA, which are to be assigned to mobile optimized websites, are supposed to facilitate the increasing mobile use of the internet mainly by increasing the performance and platform-independent development.

6.4 E-commerce

According to the German Retail Association (Handelsverband Deutschland, HDE), online retail will record a year-on-year increase of 23 percent in 2020 due to the pandemic. The online share of retail in 2020 was 12.6 percent (2019: 18.8 percent) (*HDE 2021*).

Online marketplaces gain in importance

Online marketplaces play a major role in retailing and impair the growth of providers who operate only one online shop without a market-

place connection. The platforms include various options for individual company and product presentation through to fully automated trading transactions.

Amazon already accounted for 53 percent of online sales in Germany in 2020. In addition to other established online marketplaces such as ebay, Zalando or Otto, other, specialized marketplaces are also gaining in importance, including such as manomano or moebel.de are also gaining in importance (*HDE 2021*). For advertisers, retail platforms are becoming increasingly interesting as advertising media under the keyword “retail media”.

E-commerce functions are also increasingly being integrated into social media platforms or Google. Product recommendations can be ordered for directly.

6.5 One-to-one communication

One-to-one communication is also referred to as direct marketing and comprises advertising measures, for example by means of print or e-mail newsletters or messengers, which are directed at individual recipients or recipient groups.

Customers in an online shop can be informed by newsletter about new products and current offers or a service is offered for products with further information. The target-group-specific

design of offers based on profile information can also enable targeted addressing.

One-to-one communication is primarily implemented within marketing automation systems, with particular importance attached to cross-media networking of media channels (*see chapter “5.7 Marketing automation” on page 126*).

Print media

Using digital printing or imprinting systems, personalized print mailings can be produced in any number. In the simplest form, the recipient's address varies; in complex applications, mailings, catalogs, brochures, or product inserts also output the displayed products in a customer-specific manner as recommendations based on the purchase history.

Direct mail advertising by Deutsche Post AG declined by around 10 percent in 2020 compared with the previous year due to the pandemic. Internet advertising, on the other hand, increased by around 11 percent due to increased online use.

Nevertheless, addressed advertising mailings still attract a lot of attention – almost 50 percent of recipients use them for shopping (*Deutsche Post 2021*).

E-Mail

Email marketing accounted for 32 percent of advertising budgets in 2020 (*Deutsche Post 2021*). Important requirements include compliance with data protection regulations (GDPR). For example, when selecting newsletter software, care should be taken to ensure that there is no data transfer with the USA and recipient addresses must be validated regularly.

Technically, browser compatibility and responsive design requirements must be met. Other developments include the BIMI (Brand Indicators for Message Identification) standard (*BIMI 2022*) as a visual seal of approval for e-mails and DMARC (Domain-based Message Authentication, Reporting and Conformance), a security procedure that is increasingly being used by Internet providers (*DMARC 2022*).

Messenger

83 percent of the German population aged 14 and over regularly uses messenger. By far the most frequently used messenger service is WhatsApp (81 percent), followed by Telegram (8 percent), Signal (6 percent) and Threema (3 percent). (*ARD/ZDF 2021*).

Messenger messages are used according to the medium rather for short messages, like current offers or new products. But also news services and the possibility of product orders or bookings are possible. The technical basis for this

is provided by so-called (chat) bots, which can be used to run automated processes that are increasingly equipped with artificial intelligence (AI) and function via voice control.

6.6 Social media

Social networks play an important role in marketing concepts. The most frequently used social media application is Facebook, although Instagram leads among younger people. The social media channels are used at least rarely as follows (data for 2021, in parentheses: value total population/value 14-29-year-olds):

- Facebook (38 percent/52 percent)
- Instagram (32 percent/80 percent)
- Pinterest (20 percent/43 percent)
- Snapchat (13 percent/55 percent)
- TikTok (13 percent/40 percent)
- Twitch (10 percent/36 percent)
- Twitter (8 percent)
- Clubhouse (2 percent)

(ARD/ZDF 2021)

In 2021, the company Facebook Inc. has changed its name to Meta Platforms, Inc. The social media platform Facebook will retain its name, as will Instagram and the messenger service WhatsApp. An important reason for the change of name is the development of “Metaverse”, a virtual environment.

Interesting for advertisers are the options on platforms such as Facebook and Instagram to play out advertising to the desired target groups, reach and marketing goals.

Purchasing functions are now also being integrated into social networks and messengers.

6.7 Out-of-Home

Out-of-Home (OOH) includes both printed and digital media used in outdoor communication and marketing, outside of private premises.

The media types of outdoor advertising are diverse and include large-format posters and giant posters, city light posters, mega lights, city light boards, digital displays and monitors in public areas, automotive advertising and full pillars.

Net advertising revenues in outdoor advertising fell by around 19 percent in 2020 compared with the previous year, and digital also suffered losses of around 13 percent. The most important reason was restricted mobility due to the pandemic **(ZAW 2021)**.

The MA 2021 Out of Home media analysis conducted by agma (Arbeitsgemeinschaft Media-Analyse e.V.) reports performance data for 272,000 outdoor advertising locations in Germany. This enables advertisers to plan their out-

of-home advertising strategies comprehensively (*agma 2022*) (*FAW 2021*).

6.8 E-books and e-paper

According to Wikipedia, the term e-book refers to books in digital form that can be read on e-book readers or with special software on personal computers, tablet computers or smartphones (*Wikipedia 2022*).

In this sense, the term e-book is also used in this book - with a focus on books and in contrast to digital publications that are available in the form of e-papers or apps for mobile devices. E-papers, also known as flip books, are often created on the basis of print documents and, unlike e-books, do not allow content to be automatically adapted to different display sizes. Typical applications are digital editions of newspapers and magazines.

Digital added values

Important added values for e-book readers are the variable adjustment of font sizes and search functions. Further advantages are the quick access to books at any time as well as the small space requirement and the low weight (*BITKOM 2020*).

E-Book use on the increase

According to a Bitkom study in 2021 (*BITKOM 2020*), 34 percent of Germans read digital books. In the five years before that, the share

was 25 percent in each case. Printed books are used by 84 percent. Many publishers also supply the digital counterpart with the print edition, so that both media forms coexist.

The fixed book price also applies to digital books in Germany. This means that a digital book may be offered at a different price than the printed edition, but this must be the same in all distribution channels. This already common practice was confirmed in the Book Price Fixing Act (*BMJV 2020*).

The application of the reduced tax rate of seven percent to e-books, which already applies to print products (*BMF 2021*), could be conducive to the further spread of e-books.

6.9 Moving image / Video / Audio

Use of moving images is consistently high: 74 percent of the German-speaking population aged 14 and over watched videos online daily or weekly in 2021. In the 14-29 age group, the figure is 97 percent (*ARD/ZDF 2021*).

Linear television is consumed by 84 percent of Germans over 14 at least once a month. The declining trend is mainly due to younger people. One growth trend is the use of smart TVs, i.e. TVs that have an integrated function for connecting to the Internet. 64 percent of all TV households own a smart TV, but only 80 percent of these

sets are actually connected to the Internet. Connected TV (CTV) is when Internet capability is established via additional devices such as set-top boxes, streaming sticks or even PCs or smartphones. The term CTV is often used as a generic term for Internet-enabled TV.

Another trend is the distribution of TV or moving image content via “over-the-top” (OTT), which means via the open Internet using IP protocols (as opposed to IPTV in closed networks). This includes TV providers making programs accessible via media libraries or offerings from streaming services, such as Netflix or Amazon (ALM 2021).

Areas of applications

For marketing and communication, there are also a number of possible application scenarios in the moving image area:

- Videos as advertising on the internet.
- Video streams on social media platforms for advertising purposes with interaction possibilities.
- Moving images for advertising or information purposes at the point of sale that are displayed on monitors, for example in sales rooms, at trade fairs, presentations or press conferences.
- Moving images for advertising purposes on digital outdoor advertising spaces (Digital-Out-

Of-Home, DOOH), streets and squares, supermarkets and public transport.

- Video productions in marketing materials as supplementary product information to illustrate how products work or to illustrate views of products.
- Video productions as a supplement in specialist books or magazines in order to illustrate and deepen facts and topics.

Technical realization in web-to-publish systems

The management of moving image data makes sense in media databases with integrated preview. The data can thus be assigned and used for export to digital output channels (such as websites, monitors). Optionally an individualization of video files is possible; for example by the individual customization of the intro and outro of a video.

In networked digital signage systems – also known as POS-TV – the moving image content is centrally processed and made available. The sequence of the moving images can be defined manually or automatically in so-called “playlists” or “scripts”. These moving image sequences are transmitted to or retrieved from decentralized playout locations, such as branches of a company.

Diverse channels for online video consumption

Video streaming services are the most popular, used by 53 percent of the total German popula-

tion and by 89 percent of 14-29-year-olds. The market leader is YouTube (64 percent), followed by Netflix (40 percent) and Prime Video (33 percent). Other usage options are media libraries, live TV broadcasts or videos in social media channels (*ARD/ZDF 2021*).

Growing podcast use

The use of audio services on the Internet is high, in line with the video sector: 66 percent of Germans aged 14 and over listen to audio on the Internet, and in the 14-29 age group the figure is 98 percent. Music streaming services are used most frequently (45 percent), and among younger people the figure is 84 percent. The market leaders are Spotify (28 percent) and Amazon Music (14 percent). Podcasts are listened to much more frequently, with at least infrequent use rising by 9 percentage points from 27 percent (2020) to 36 percent (2021). (*ARD/ZDF 2021*)

Voice assistants, such as Alexa, Cortana, Google Assistant or Siri, are used by just under 40 percent of Internet users. The most common applications are music playback (79 percent) and controlling household appliances (74 percent), followed by information queries on transport connections, weather or sports (*BITKOM 2020*).

6.9.1 Virtual Reality (VR) and Augmented Reality (AR)

In virtual reality applications, interactive worlds are designed on a digital basis in which people move, act interactively and see themselves as part of this environment. Movement in virtual space is made possible by data glasses with integrated motion sensors that record head movements and translate them into virtual reality.

According to a survey by digital association BITKOM, 17 percent of Germans use VR glasses, and interest in them is growing. The association also examined users' fields of application:

- Computer and video games (77 percent)
- Virtual travel (71 percent)
- Consuming movies (56 percent)
- Watching concerts (39 percent)
- Sports activities (37 percent)
- Education and learning (16 percent)
- Visiting exhibitions and trade shows (12 percent)
- Professional use (7 percent)

(*BITKOM 2022*)

The announcement by the technology group Meta (formerly Facebook) of the development of "Metaverse", a virtual world that is to become reality in everyday life, has already brought high

sales of VR glasses. The first advanced examples are in the games sector (*Knitterscheidt 2022*).

In contrast to virtual reality, users of augmented reality applications remain in the real world. Objects are captured by mobile devices, like data glasses or apps, using intelligent image recognition techniques and then linked to the appropriate digital content.

The company Küchenquelle uses AR technology with Microsoft Hololens AR glasses for sales support in kitchen planning. Sales consultants design the kitchen at the customer's premises using 3D software, and the customer can view the model within the future environment using Hololens glasses (*Campillo 2021*).

Another example is the Snoopstar app, which scans products in Aldi Süd's brochures with a smartphone and plays back examples of use or information on how to use them in an eventful form (*Campillo 2022*).

6.10 Mobile

The term "mobile" refers to advertising and communication measures that are transmitted to recipients by means of mobile devices or trigger actions. Applications in the area of location-based services are particularly linked to mobile devices. In this context, technologies such as Beacon, NFC or QR codes, which act as a "media bridge" between print, online and offline channels, should be mentioned.

Location Based Services (LBS)

Location-based services (LBS) are transmitted via apps and integrated location recording (GPS, WLAN, Bluetooth or radio cell location) depending on the geodata of users of mobile devices. If the target persons enter a defined area, advertising is played out in the form of "push notifications" (see below). This is also called "Geofencing" (artificial word from "Geographic", and "Fence"). LBS require the consent of the users.

Near Field Communication (NFC)

NFC is a radio technology that can transmit data between devices over short distances (up to about 4 cm). The standard integration in smartphones will increase the number of applications for NFC. "NFC tags", which contain a chip with an antenna, are applied to objects and activated by placing the NFC-enabled smartphone on them. Additional apps do not need to be installed. One area of application is cashless payment in retail.

Beacons

Beacons are radio chips based on Bluetooth radio transmission technology that can transmit signals at regular intervals and thus bridge distances of several meters. The radio signals establish the connection to a specific mobile device app that processes the location data.

QR-(Quick-Response-)codes

QR codes are generated in the form of square patterns containing encoded information and links to websites, email or social media channels. When photographing the QR code on printed matter or displays, actions are triggered with a mobile device and a QR Read app. In the event that an app is not available, naming a simple URL for later retrieval can lead to a mobile-optimized website.

Push notification

Push notifications are messages that the user of an app receives, provided he gives his consent. These messages can be sent in response to a specific action or can be made dependent on the user's location without the app having to be open.

6.11 Internet of Things

Internet of Things (IoT) involves machines, devices, buildings and vehicles in industry and everyday life in digital data cycles. On the basis of internet technologies such as WLAN, states are determined in real time and the resulting information is forwarded to IoT platforms for further processing, triggering actions and evaluation. To perform these functions, objects are equipped with sensors, radio chips, location systems and internet-capable mini computers. Advanced solutions are also self-learning based on usage habits.

Also the so-called “wearables” belong in the extended sense to the Internet of Things. These are portable computer devices that can be worn on the head or body. Examples are data glasses, watches (“Smartwatch”) or bracelets (“Fitness Trackers”).

Examples of areas of application:

- Anti-burglary devices on doors and windows or smoke detectors that send messages to a smartphone in the event of an alarm.
- Parcel tracking via Internet
- Automatic acquisition of vehicle data and resulting messages.
- Automatic control of heating or cooling systems.
- Control of stock levels through automatic post-production.

7 PRACTICE AND SOLUTIONS

7.1 “Content First” instead of “Print First” in the entire production process at Heise Medien

AUTHOR: MATTHIAS KRAUS, CEO XPUBLISHER

By implementing Xpublisher, Heise Medien succeeded in establishing transparent and well-organized content and media asset management together with a highly streamlined production process for its magazines. Xpublisher supports efficient content utilization along the entire value chain, from planning, editorial creation, editing, and layout to the final publication.

Successful high-tech news

“High-quality independent journalism is our trademark.” True to that principle, Heise Medien GmbH & Co. KG, one of Germany’s leading tech industry publishers, publishes magazines that include c’t, iX, Mac & i, the technology magazine Technology Review, and the multiple-award-winning online magazine Telepolis. The heise online website is also a primary source of German-language high-tech news.

The challenge: Automating the Heise Medien production process

Optimizing and automating magazine production while simultaneously repurposing content across a multitude of digital channels is a significant challenge for many publishers. And in the case of “print first” processes, it leads to an enormous amount of work. In order to publish across multi-

ple channels in a way that is highly efficient, cost effective, and error free, Heise Medien made the decision to completely overhaul its Heise Medien production processes as part of its “Content First” project.

This involved defining a number of key requirements, which included:

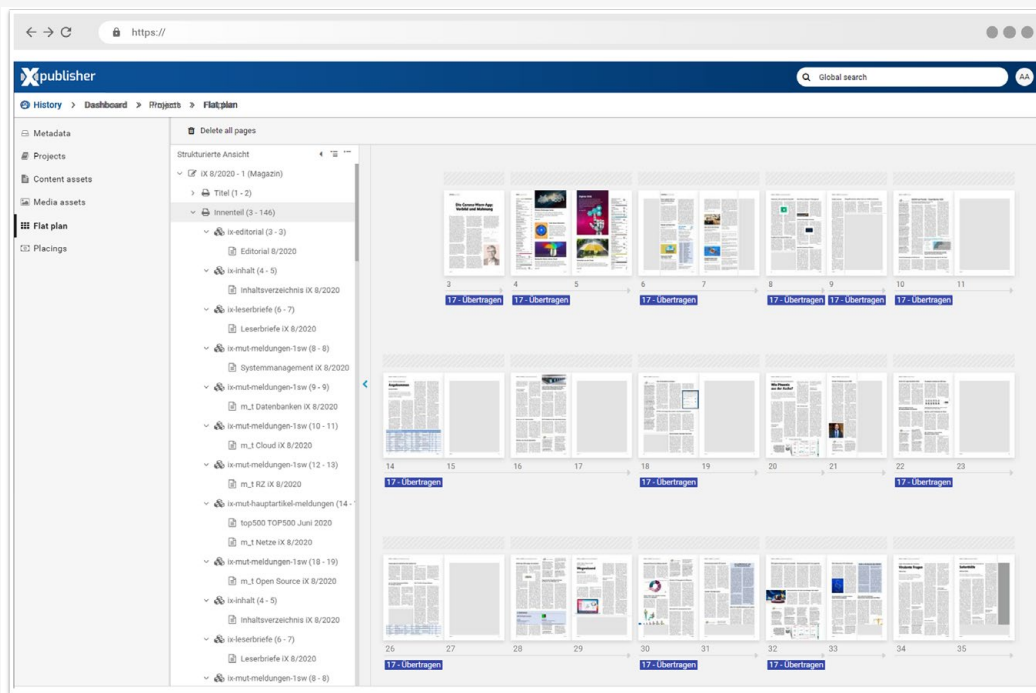
- Standardizing processes across all titles and editorial departments and setting up a central production unit.
- Establishing the means to combine content across the entire company to create new products, such as cross-brand subject-specific dossiers – in a way that is highly automated and not tied to a specific medium.
- Reducing the amount of administrative work involved in producing magazines across all formats, as well as for in-house development of proprietary production tools.
- Focusing the work of each employee on his or her core competence.

All of the proposed measures were designed to increase efficiency in the overall process and shorten production times.

The solution: Implementing Xpublisher

To meet these challenges, Heise Medien turned to Xpublisher. The first step was to give all employees – from the editorial team to the desktop publishing (DTP) department to the in-house IT staff – the opportunity to take a closer look at the Xpublisher online editorial system in the context of a simulated production process. The next step was to define the requirements together

during joint workshops. Then followed the task of transferring and optimizing the existing process in the Quark Publishing Platform into an InDesign workflow. As a result, all processes were standardized and the specific needs of the individual editorial teams and users were integrated.



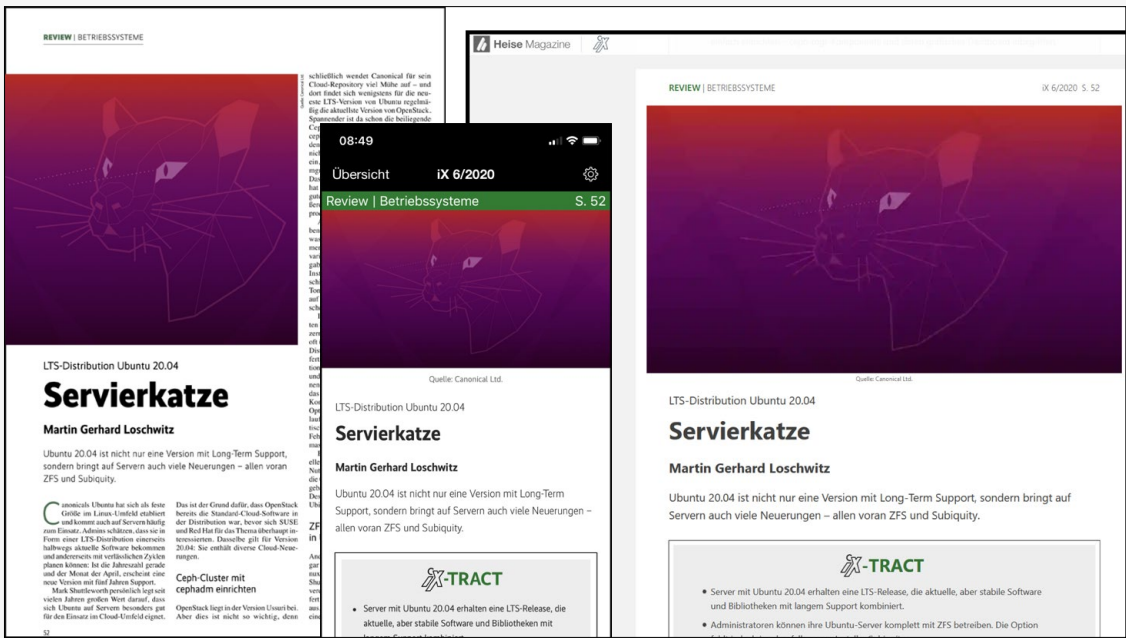
Page planning of the new c't issue with Xpublisher.

Increased production based on efficient workflows

Configuring Xpublisher and connecting it to the in-house systems was accomplished by applying agile work practices to deliver initial results quickly. That also helped when it came to adapting requirements from the definition phase on short notice whenever necessary. After just one year, Heise published the first issue of iX magazine, produced entirely with Xpublisher.

This was soon followed by Technology Review and the most prominent title in the portfolio, c't, as well as an additional magazine every three to four months.

The numbers are a testament to the project's success: Instead of the typical production phase of ten days, the first issue of c't was ready for printing in just nine days. In digital production, the company succeeded in both enhancing quality and shortening the production time.



Automated iX output to print, mobile, and website.

Going forward, this extra time will be available for other projects and further growth. Xpublisher provides the full range of tools and capabilities, enabling Heise Medien to recombine existing content with very little manual effort and to launch this content by means of innovative products such as special editions devoted to specific topics.

“Thanks to the excellent support and the completely goal-oriented collaboration with our colleagues from Xpublisher, we’ve mastered the conversion of our print products to Xpublisher superbly, resulting in shorter production times and a lasting boost in the quality of our products”, says Christine Kreye, Head of Production Heise Medien.

PROVIDER

Xpublisher GmbH, a leading provider in multi-channel publishing, offers intuitive solutions for the creation, management as well as automated publication of magazines, books and documentation with Xeditor and Xpublisher. Founded in 2009, the company has been part of the Fabasoft Group since 2019. Numerous leading international companies and organizations rely on Xpublisher’s products.

Xpublisher GmbH
Schleißheimer Street 6-10
80333 Munich
www.xpublisher.com
+49 89 54726178-0
service@xpublisher.com



CLIENT

Heise Medien is one of the leading IT publishers in Germany. The media company publishes titles such as c’t, iX, mac & I, the technology magazine Technology Review and the award-winning online magazine Telepolis. heise online is the leading medium for German-language high-tech news.

Heise Group GmbH & Co. KG
Karl-Wiechert-Allee 10
30625 Hanover
www.heise-gruppe.de
+49 511 5352-0
info-hg@heise.de



8 APPENDIX

8.1 Provider directory



**MARKET OVERVIEW
WEB-TO-PUBLISH**

Providers with this symbol have an entry in the interactive MARKET OVERVIEW Web-to-Publish at www.Melaschuk-Medien.de.



**CERTIFICATION „ECOSYSTEM
MARKETING AND COMMUNICATION“**

Providers with this symbol are certified according to the “Eco-system Marketing and Communication” of Melaschuk-Medien – www.oekosystem-marketing.de.



**QUALITY SEAL
SIMIO ANALYSIS**

Providers with this symbol have a seal of quality from SIMIO – Jürgen Burger – www.simio-analyse.de

The respective providers are responsible for the information in this directory.
Melaschuk-Medien assumes no liability for the contents.

BERTSCH INNOVATION GMBH

Kronenstraße 25
DE-70174 Stuttgart

bertschinnovation.com/en/
bertschinnovation.com/en/product/mediacockpit/

Contact:

Johannes Kowalski
+49 711 968 816 0
johannes.kowalski@bertschinnovation.com

E-RAUMWERK GMBH

Engelbertzstr. 16
DE-53121 Bonn
info@e-raumwerk.de
+49 228 304 018 60

www.e-raumwerk.de/en
www.e-raumwerk.de/de/snello/

Contact:

Marcus Köhler
+49 228 304 018 60
m.koehler@e-raumwerk.de

BERTSCH INNOVATION

smart product information

Bertsch Innovation develops software solutions for PIM, DAM, and electronic catalogs.

With mediacockpit, Bertsch Innovation currently helps more than 1,000 companies from industry and commerce to win new customers and retain them permanently by means of outstanding product and media content.



MARKET OVERVIEW
WEB-TO-PUBLISH



QUALITY SEAL
SIMIO ANALYSIS



Since 2016, e-raumwerk GmbH has been engaged in scaling strategies. In 2021, e-raumwerk launches SNELLO.

SNELLO is the world's first easy-to-use and wizard-driven email automation solution for decentralized teams, dealers and partners based on premium technology Evalanche in a headless approach.



MARKET OVERVIEW
WEB-TO-PUBLISH

NOVOMIND AG

Bramfelder Chaussee 45
DE-22177 Hamburg
+49 40 80 80 71-0

www.novomind.com/en/
www.novomind.com/en/pim-system/novomind-ipim-pim-software/

Contact:

Patrick Stephan
+49 40 80 80 71-0
info@novomind.com

SITEFUSION GMBH

Küstriner Straße 14
DE-94315 Straubing

www.sitefusion.com

Contact:

Thomas Weinberger
CEO SiteFusion GmbH
thomas.weinberger@sitefusion.com
+49 9421 7847 125



NOVOMIND

CUSTOMER FOCUSED. TECHNOLOGY DRIVEN.

novomind AG has developed intelligent omni-channel commerce and customer service software solutions for global use for more than 20 years and is among the technology leaders in Europe.



MARKET OVERVIEW
WEB-TO-PUBLISH



QUALITY SEAL
SIMIO ANALYSIS

SITEFUSION

diversify your content

SiteFusion is one of the leading XML-based Content Management and Workflow Solutions for publishers. Numerous well-known organizations rely on the solution for the creation, management and publication of assets, content, and products into a wide variety of analog and digital channels.



MARKET OVERVIEW
WEB-TO-PUBLISH

VJOON GMBH

Kieler Straße 103-107, Haus D
DE-25474 Bönningstedt

www.vjoon.com

Contact:

Holger Kraemer
business@vjoon.com
+49 40 55 69 50 0



vjoon is one of the world's leading software providers for digital content management. With K4, vjoon offers one of the most powerful publishing systems and with seven one of the most modern DAM systems on the market. Integrated, they optimize workflows and offer users a unique UX.



MARKET OVERVIEW
WEB-TO-PUBLISH

XPUBLISHER GMBH

Schleißheimer Straße 6-10
DE-80333 München

www.xpublisher.com

Contact:

Lucia Höll
+49 89 54726178-38
lucia.hoell@xpublisher.com



Xpublisher GmbH, a leading provider in multichannel publishing, offers intuitive solutions for the creation, management and automated publication of magazines, books and documentation with Xeditor and Xpublisher. Numerous leading international companies rely on the products.



MARKET OVERVIEW
WEB-TO-PUBLISH

8.2 Market overview web-to-publish

The market overview Web-to-Publish of Melaschuk-Medien covers web-based software solutions and services in the fields of marketing, product communication, media production and cross-media.

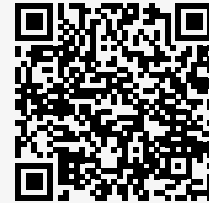
The market overview is available in an interactive version on the MELASCHUK-MEDIEN.de website. Filter functions allow systems and services to be evaluated on the basis of important selection criteria and provide an initial orientation in the wide range of software available.

The research tool has already been awarded the IT Innovation Prize of the Initiative Mittelstand several times.

In the further process of system selection, the evaluation and selection of suitable systems take place according to the specific customer requirements and priorities.

Melaschuk-Medien supports this process with consulting and workshops. Customers and partners particularly appreciate the broad market overview and the provider-neutral approach.

[**WWW.MELASCHUK-MEDIEN.DE/**](http://WWW.MELASCHUK-MEDIEN.DE/)
MARKTUEBERSICHTEN-WEB-TO-PUBLISH.HTML



www.it-bestenliste.de

M MELASCHUK
 MEDIEN

8.3 Supporters

8.3.1 University of Wuppertal

Printing and Media Technology is a section of the School of Electrical, Information and Media Engineering of the University of Wuppertal. With innovative research and a future-oriented education the faculty meets the technological change – including smart packaging, 3D printing applications, cross-media documents, augmented and virtual reality and deep learning in media production.

Research and teaching are closely interlinked and students are directly involved in research works e.g. as part of their final theses.

Two six-semester degree programmes lead to a **Bachelor's degree**:

The **Combinatorial Course** of studies in which printing and media technology is combined with economics, computer science or media design and design technology.

The **engineering science course of studies** Information Technology and Media Technology. This new course combines the basics of computer science with media technology applications.

The four-semester Master's programme in Print and Media Technology is based on the undergraduate programs. The selection of optional modules offers the individual opportunity to deepen media technology engineering knowledge or to acquire technical management skills. The **Master's degree** is the prerequisite for a doctorate as Dr.-Ing.

For the teaching profession at vocational schools, the first step is to complete the combinatorial course of studies; this involves combining printing and media technology with another school subject or another vocational specialization. This is followed by a four-semester Master's programme with several practical phases. The **Master of Education** degree is equivalent to the first state examination for the teaching profession.

Further informations:

www.dmt.uni-wuppertal.de/en



8.3.2 Berliner Hochschule für Technik

“Study the future” is the motto of the Berlin University of Applied Sciences.

Founded in 1971, the state university of applied sciences offers more than 70 bachelor's and master's degree programs for more than 12,000 students. One of these is the Print and Media Technology course, which was established in 1995. It was designed from the outset to be cross-media in nature. The content is updated regularly – since 2005 as a bachelor's and consecutive master's degree program.

„Shape your path“ is the motto that students have given the course. Because: over 56 % of the six-semester bachelor's program can be freely designed.

In the 3rd and 4th semesters, 26 elective subjects are offered. The subjects come from the areas of prepress, press and postpress, interactive and audiovisual media, IT and business administration.

Very well-equipped Mac labs, a photo studio, and technical labs equipped with modern printing and postpress machines allow for hands-on practice and project-oriented study.

The course-integrated internship is in the 5th semester and offers intensive experience in the field of printing and media technology.

The four-semester master's program broadens the student's view of scientific topics, innovative research fields and an international perspective. One semester can be spent studying abroad with a focus on media technology.

www.bht-berlin.de

The study programs also present themselves at:
www.dmt-berlin.de

If you are interested and have any technical questions, you are also welcome to contact the study advisors for print and media technology.

Prof. Dr. Shahram Hauck (Bachelor's program):
shauck@bht-berlin.de

Prof. Dr. Patrick Godefroid (Master's program):
godefroid@bht-berlin.de



8.3.3 dmpi – Industrieverbände Druck und Medien, Papier- und Kunststoffverarbeitung

Community makes you strong

Political lobbying, legal, business and technical advice, training and advanced education – take advantage of the services offered by the printing and media, paper and plastics processing associations in Baden-Württemberg. We represent around 350 companies in the sector. The competition between the media and the coming challenges at national and international level make it clear more than ever how important it is for companies to join forces in the association. Better together stronger!

Services

- As an employers' association, we conclude the collective agreements for the sectors.
- We represent our members before labour and social courts in all instances by lawyers with special qualifications in labour law.
- Company agreements or in-house collective agreements – here you will find us at your side.
- Through our engagement in recruiting junior staff and in training and advanced education, we ensure that well-trained specialists continue to contribute to your business success in the future.

- We organise platforms for the exchange of experience with various industry events or our network meetings.
- The board and advisory board of the association set the political course.
- With public relations and press work, we are committed to the interests of the companies.
- Our subsidiary printXmedia Süd supports its members in all technical and environmental issues – from process standard offset printing or digital printing via dampening solution test form or press acceptance to the CO2 climate initiative.
- printXmedia Süd is also the consulting partner in business management matters. Planned cost accounting, comparison of financial ratios and operational analyses – you will find the experts here.

To the website: www.dmpi-bw.de



Industrieverbände Druck und Medien,
Papier- und Kunststoffverarbeitung
Baden-Württemberg

8.3.4 drupa 2024 – no. 1 for printing technologies

Digital printing technologies and their various print applications offer great design opportunities for cross-media productions.

They are the focus of drupa, which will be held again in Düsseldorf from May 28 to June 7, 2024. The world's leading trade show for printing technologies sets crucial impulses for the print and media industry.

What influence do the megatrends of sustainability and digitization have on processes, products, business models and the future of the industry? drupa 2024 will showcase cutting-edge technologies along the entire value chain of the industry with a special focus on future and cross-sectional technologies.

In this context, topics such as Circular Economy, Automation, Print/Finishing 4.0, Artificial Intelligence, Platform Economy and Connectivity will play a central role in the conference programme and dedicated forums.

drupa cube and other touchpoints relating to packaging, textiles and sustainability will offer visitors detailed insights into relevant topics and provide impetus for growth potential and further development of respective business models.

drupa stands for inspiration, innovations, top-class knowledge transfer and intensive networking. This is where top international decision-makers from the industry meet and exchange ideas on the latest technology trends and groundbreaking developments.

Be there – see you at drupa 2024!

You can find further information under:
www.drupa.com



8.3.5 Fachverband Medienproduktion e. V. (f:mp.)

f:mp. is committed to the interests of media producers in the brand industry, advertising and production agencies, service and industrial companies and producers in publishing houses.

Well over 1,800 members play a key role in the development of industry trends and benefit from in-depth knowledge of all aspects of media production.

More activity

The f:mp. actively represents the interests of media producers, arranges important contacts, advises and supports. As part of a strong community, the members can participate in the development of competence, develop creative concepts and new ideas.

More innovation

The f:mp. invests in innovation. In cooperation with industry experts, new trends and opportunities are identified, their practical benefits assessed objectively and competently and promising future strategies developed on this basis.

More competence

The f:mp. brings together experts and members from various areas of media production in a strong network and thus promotes the development of new trends and technologies as well as competence and know-how along the entire value chain.

More knowledge

The f:mp. training courses have a very special significance in the industry, as they always focus the participants' attention not only on the latest technology but also on sustainable trends and potentials. In addition, f:mp. offers the opportunity to learn from experienced experts and collect relevant know-how in numerous seminars and roadshows.

Industry initiatives of the f:mp.:

www.programmatic-print.org
www.mediamundo.biz
www.print-digital.biz
www.go-visual.org
www.printperfection.de
www.creatura.de

f:mp. on the Internet:

www.f-mp.de

f:mp.
 fachverband
 medienproduktion

8.3.6 Fogra The Research Institute for Media Technologies

Independent, committed – an asset for the printing and media industry.

We work for the good of the industry; not in competition with print and media companies. Our members are small, medium and large companies across the entire spectrum of the industry, from equipment manufacturers to the producers of printed and electronic media. Our research is application-focused and we have been involved in the development of many forward-looking and globally acknowledged process and quality inspection standards.

Research with impact.

In our research we tackle the themes that are key to the future of media technology. We are in constant dialogue with companies to identify subjects for investigation that are geared to their requirements. For us, delivering the results of our research in usable form is a given.

Practical solutions.

We combine high quality technical research with practical application, developing, for example, objective measurement methods and process standards. We see ourselves as a modern service provider that carries out inspections tailored to the industry's needs, that advises companies on questions of quality and that mediates in technical disputes.

Passing on what we learn.

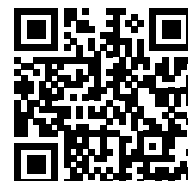
Our capital consists of a massive and constantly expanding body of knowledge combined with a high degree of technological expertise and a detailed understanding of current developments. We make this available to the industry through numerous publications, one-to-one consultancy, symposia and other specialist events through which we promote and support the discussions of themes that are key for the future.

Constant dialogue.

We offer media companies an expert network and support them in making their adjustments to structural change. In doing so we want to stimulate the opening up of new areas of business and to ensure that the industry is properly configured for the future.

www.fogra.org

To YouTube-Video
"WE ARE FOGRA"



8.3.7 Hochschule der Medien (HdM)

The Hochschule der Medien (HdM) in Stuttgart is a state university for applied sciences that educates specialists and all-rounders for the media world.

The range of courses offered under one roof is unique in Europe. Almost 30 accredited Bachelor's and Master's degree programmes are available: from printing to audiovisual media, information management and computer science, advertising or media production to media management and packaging technology.

In all study courses, active knowledge transfer is offered through well-founded theory and practical projects. Media content, technology and business are interlinked, teamwork is trained and complex challenges are mastered.

The course contents are regularly reviewed and adjusted to current developments in the media industries. A practical semester is part of the Bachelor's programme and underlines its practical relevance.

In cooperation with partner universities, students can also do their doctorate at the HdM.

Applications such as the Internet, mobile TV, visual radio, the mobile office or computer games, their platforms and end devices such as mobile phones, notebooks, portable game consoles or infotainment and navigation systems are the focus of the HdM's app course:

[Mobile Media](#).

It offers interdisciplinary studies in this rapidly growing media sector. Students design and develop applications for mobile devices, design business models and learn to realize services. In addition to technical feasibility, the focus is on the provision of content, its design and user-friendliness, as well as the planning and correct use of marketing strategies and sales models.

Links:

www.hdm-stuttgart.de – the university

www.hdm-stuttgart.de/mm – the study course Mobile Media



8.3.8 Hochschule Wismar

Openness, transparency, participation, many freedoms and at the same time clear structures: The Faculty of Architecture and Design at Hochschule Wismar, University of Applied Sciences, Technology, Business and Design offers a solid and at the same time multi-layered studies in the diploma program Communication Design and Media and the Bachelor's programs Architecture, Design – Product and Design – Product and Jewellery and Interior Design as well as the Master's programs Architectural Lighting Design, Architecture, Interior Design and Material Culture Design and the numerous distance learning programs through WINGS GmbH.

Up-to-date teaching content professionally and socially relevant topics, as well as modern equipment are a matter of course – the Faculty of Architecture and Design also attaches great importance to classical techniques and fundamentals. Photo fine printers, for example, are juxtaposed with tintype and lithography, and in addition to the latest studio and medium-format digital camera technology, students can work with several analog cameras and in photo labs with classical photochemistry. The examination of user experience and programming backgrounds is supported by discussions of cultural history and cultural studies.

In addition, students collaborate on projects across degree programs and faculties (in addition to design, economics and engineering).

Approximately 2000 square meters of laboratory and workshop space are available to students at the Faculty of Architecture and Design at Hochschule Wismar, University of Applied Sciences, Technology, Business and Design.

The student studios are accessible 24 hours a day, around 350 days a year, through a chip card system.

The Faculty of Architecture and Design at Hochschule Wismar, University of Applied Sciences, Technology, Business and Design on the Internet:

www.fg.hs-wismar.de/en



8.3.9 morntag

Innovation is a matter of the heart. That's what morntag stands for. A family business with a big heart for customers, an eye for the big picture and a passion for new things.

Good ideas should never fail when it comes to realization. morntag helps to transport great ideas into the world. May it be it with a new website, social media, print products or even a content-first system based on WordPress. Personal, straightforward and efficient, that's how working with morntag feels. You can also get help with problem-solving from morntag. In workshops or also in personal 1 to 1 support.

In addition to production, training and support, morntag also offers valuable coaching. Changes in the digital world have an impact on how people communicate, produce and collaborate. With coaching from Haeme Ulrich, you can discover how to think into the future even on Mondays. This offer is for everyone: solopreneurs, small agencies and big players.

May it be it in production, technical support, workshops or personal coaching. morntag means innovation at your fingertips.

www.morntag.com

With over 45,000 monthly readers, publishingblog.ch with the authors of morntag is one of the largest blogs in the German-speaking publishing industry. Authors from education, publishing and marketing share their mindset and know-how. The huge wealth of experience and the valuable community are fun!

www.publishingblog.ch



morntag

8.3.10 PDFX-ready

For 17 years, the PDFX-ready association has played a key role in shaping the print and media industry. The primary goal is secure and efficient data exchange. The association is supported by the two printing associations in Switzerland, Viscom and VSD, system integrators, training companies, trade journals and suppliers as partners. Four working groups form the foundation. These are education and training, technology, certifications and marketing.

The PDFX-ready association is open to all companies or individuals interested in the PDF/X data format. There are currently 160 corporate and 31 individual members. Members can obtain the PDFX-ready Creator and/or the PDFX-ready Output Certificate for PDF/X-4 in offset, digital printing or proofing.

PDFX-ready offers courses for corporate or school classes. Practical individual workshops are organized which cover the entire spectrum, from PDF creation from the most important prepress and office programs, through data checking, PDF preparation and certification, to output.

Through its active participation in the Ghent Workgroup, PDFX-ready benefits from the current developments relating to the ISO PDF/X standard. The association uses this knowledge to create settings and instructions for data creation

and preflight profiles for checking to ensure reliable print data transfer. You can find these in the download area on the website.

The latest development is the PDFX-ready converter from Office PDF to PDF/X-4 print template. With the help of two preflight profiles, PDF files from Office programs can be converted to digital PDF/X-4 print templates.

Subscribe to our newsletter, follow us on LinkedIn or visit our website www.pdfx-ready.ch.

This way you will always stay PDFX-ready!

www.pdfx-ready.ch/en

www.pdfx-ready.ch/en/downloads

<https://ch.linkedin.com/company/pdfx-ready>



8.3.11 publishingNETWORK (Fachverband Medienproduktion)

publishingNETWORK wants one thing above all else:

Generate knowledge. Publishing develops rapidly and grows into upstream service areas. This also changes the job profile of the publisher. Everyone has to stay on the ball today when it comes to technologies, solutions, training and visions of the future.

Professional competence + network

At publishingNETWORK, specialists join forces to form a competence center and benefit from combined resources. Through our networks of experts, we maintain close contact with current events – regardless of whether it's a matter of looking at trends in the technological field or developing technology standards.

We maintain cooperation with various associations in the graphic arts industry, ICT Berufsbildung Schweiz and associations in Germany. Always with the focus on acquiring the knowledge and skills that are important for your job and your industry.

publishingNETWORK, as an independent industry authority, coordinates the professional further education “Publisher Basic” for creative lateral entrants in media production as well as “Publisher Professional” with the three main

profiles multimedia, design and technology. For the CAS Digital Communication Excellence training at the HTW Chur, the professional association is responsible for the technical content.

publishingNETWORK offers:

- Expert Network Switzerland – online and real
- Forums, lectures, seminars, diploma courses, industry information service, supplier-independent specialist information
- Support in questions of basic education
- E-Learning platform Mediametro.ch, current teaching materials
- Courses Publisher Professional Technology and Project Manager Publishing in cooperation with dmpi, Germany
- Lobbying for practical and contemporary advanced education

Contact:

www.vsd.ch/publishingnetwork
<https://de.linkedin.com/company/publishingnetwork>
facebook.com/publishingnetwork
twitter.com/pubNETWORK

publishingNETWORK
 Fachverband Medienproduktion

8.3.12 rb omnichannel

rb omnichannel is specialized in consulting and project management in the field of marketing technology.

There is no way around digitalization. For marketers of companies of all sizes and industries, this is often a major challenge – especially when it comes to harmonizing strategies, processes and technological possibilities. This is where rb omnichannel provides support in all project phases: From the business case to the complete implementation of new processes and technologies. Depending on the type of project, rb omnichannel acts as a consultant, project manager or product owner.

Focus

With a focus on the respective requirements, rb omnichannel supports technology implementation in the following areas, among others:

- Web-to-Publish
- Marketing Management Systems
- Product Information Management
- Digital Asset Management
- Marketing Automation
- Holistic view of the process and system landscape

Personal

Roland Bühler founded rb omnichannel GmbH in 2017 – after holding executive positions at agencies and system service providers. He has experience in managing complex and international projects for customers in the industry, automotive, retail, FMCG, advertising, print and media sectors. Activities for analyst firms complete his profile.

Certifications are available in the following areas: Scrum, PRINCE2 (Agile), ITIL, Java, Google, AWS, Data Science, Machine Learning, Design Thinking, Lean UX, Data Protection.

Website:

www.rb-omnichannel.com



8.3.13 Schule für Gestaltung Zürich

Continuing education as the key to success

In Switzerland, two-thirds of people have an apprenticeship diploma by the age of 25. This means they have gained an early foothold in the labor market. The combination of basic knowledge and practical experience makes them sought-after specialists. A new study by SECO shows that apprenticeship graduates find attractive jobs, earn good salaries and rise quickly to management positions.

At the Zurich School of Design, around 1,500 learners are preparing for apprenticeships in 26 professions in the fields of media, form and color. Basic training is supplemented by a range of continuing education courses, which are currently attended by around 1000 students. Six part-time courses focus on analog and digital media and concentrate on the design, production and management of analog and digital communication:

- Betriebsfachmann/-fachfrau Druck- und Verpackungstechnologie (higher vocational education, degree EFA).
- Advertising technology specialist (advanced vocational training, EFA degree)
- Interaction design (college)
- Media technology (college of higher vocational education)
- Techno-polygrapher (Advanced vocational training, EFA degree)
- Visual Design (University of Applied Sciences)

Feedback from former students shows that the School of Design Zurich is not only an inspiring place to learn, but also the starting point for remarkable careers. The practical orientation of the lecturers, up-to-date learning content and the opportunity to network at the school are keys to success.

www.sfgz.ch



Schule für Gestaltung Zürich

8.3.14 simio – Jürgen Burger

Our fields of activity

We support companies that want to improve their product communication and need appropriate systems to do so. Our support consists of providing objective and structured market overviews (“navigators”) as a first orientation tool on the one hand, and personal consulting from requirements management to the final decision for a concrete solution on the other hand. Our most important objective is always to identify the most suitable solution together with our customers, thus laying the foundation for long-term and successful partnerships.

In addition, we constantly monitor the market of technology providers in the field of product communication and conduct detailed analyzes of individual solutions. We publish the results of these analyses in the form of our quintessences on simio-analyse.de.

The thematic fields

Our core competence lies in the areas of PIM (Product Information Management), MDM (Master Data Management), PXM (Product Experience Management) and MAM (Media Asset Management) or DAM (Digital Asset Management).

Through close partnerships with experienced experts, we are also able to provide the above services in related areas (such as publishing, CRM, marketing automation, CPQ, etc.).

Our unique selling points

- We are independent and objective.
- We have a deep knowledge of the provider market through project experience and analyses.
- We have a very comprehensive know-how through our network of experts.
- We value and live values such as respect and honesty.
- We have a holistic view of solutions (i.e. not only systems, but also companies, system implementation and people involved).
- We are aware that not only data and facts are important when selecting optimally fitting solutions, but also the so-called “soft” factors play a major role. In order to be able to determine and convey these, we place particular emphasis on personal contact in analysis and consulting.

www.simio-analyse.de/en



Analyse | Digitalisierung | Beratung

8.3.15 Verband Druck und Medien Hessen e. V.

The Association of Print and Media Hessen e. V. (VDMH) is a strong and reliable partner for prepress companies, media agencies and service providers as well as printing and finishing companies.

At the heart of all the VDMH's work is ensuring the entrepreneurial success of its member companies. This is why the VDMH service network offers a differentiated and exclusive portfolio of consulting and services in addition to active representation of interests in politics and administration.

We inform and advise you in the fields of labour law, business administration and technology. In addition, we help with company training and further education as well as environmental protection. For support and advice, printXmedia Süd, the joint service subsidiary of the print and media associations, is at your disposal.

With our industry-specific experience and knowledge, we accompany you in mastering entrepreneurial challenges and daily tasks in your company. In addition, we present our industry to the outside world through effective public relations work.

Inform yourself about new industry standards and technologies. If you do not want to cover new business areas yourself, we will arrange cooperation with other companies, exactly according to your specifications.

Do you need help with daily problems? Our Germany-wide network has a large pool of experts at its disposal who will be happy to assist you with advice and assistance. The VDMH is there for you!

Please consult us, we will help you further.

www.vdmh.de

Seminars and trainings:

Presence seminars: www.vdmh.de/seminare

Online education platform: print-academy.de



Verband Druck und Medien
Hessen e. V.

8.3.16 Verband Druck Medien Österreich Print Media Association Austria

We have been Austria's voice for the print and media industry for 150 years now and consider ourselves the first place to go for everyone who wants to know about printing.

With over 200 members, the association is not only the **largest private network** for printing and the graphics industry in Austria and a source of inspiration for the industry, but also a platform for networking and exchange between members, partners, and their customers.

MEMBERSHIP

Our members benefit from our comprehensive services and win clear added value for their company's success:

- ✓ Door opener for new business contacts through free advertising of our members and partners in the association's print and online media.
- ✓ Advice and support on legal and business issues.
- ✓ Certifications: PRINTED IN AUSTRIA, the CSR certificate for printers and a carbon footprint calculator for printing at exclusive member rates.
- ✓ Webinars, seminars and lectures for (continuing) education.

- ✓ Representing our members' interests in politics and the media.
- ✓ Trendsetter and innovation driver for the industry.

PARTNERSHIP

As part of a **partnership**, we offer service providers for printing companies the exclusive opportunity to reach the B2B top decision-makers in the Austrian printing and media industry and their customers.

Due to our **strong market position** and a considerable cross-industry reach in social media, the Verband Druck Medien is the **ideal advertising platform** for companies and a door opener for new business contacts.

CONTACT

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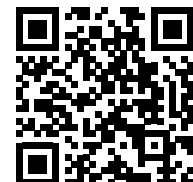
verband@druckmedien.at

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www.linkedin.com/company/vdmoe/



VERBAND
DRUCK | MEDIEN
ÖSTERREICH



8.3.17 Winter Consulting

Do you really speak your customers' language?

Today, communication is subject to change.
We find the right words.

Who we are

Winter Consulting is your adviser for modern customer communication.

Since 2002, owner Sandra Winter and the team at Winter Consulting have successfully invested their extensive experience in the development and implementation of customised communication campaigns to numerous projects – hand in hand with clients and our network.

How we work

Our customers appreciate working together with us because we offer a convincing mix of creativity and realization power.
So let's work together!

Why communication is so important

Behind every product, brand or service there is an idea with a fascinating success story.
Let's talk about it!

What we can do for you

We are at your side to help you communicate and find the right words – for both individual projects and long-term campaigns.

These includes:

- Strategic corporate communications
- Implementing of marketing campaigns
- Event planning and organization
- Moderating of your customer events
- Creating specialized articles and texts
- Coordinating your PR work

Visit us at www.wintercon.de

We look forward to having you on our site !



8.4 About the author

Ira Melaschuk is a graduate engineer for printing technology and owner of the management consultancy **Melaschuk-Medien**.

Her work focuses on web-based system solutions for marketing, product communication, cross-media and publishing.

The fields of work include consulting projects around system selection, digital and printed publications as well as training activities.

Workshops and training activities

Ira Melaschuk holds workshops on behalf of customers and is a lecturer for the subject “Web-to-Publish” at the University of Wuppertal in the master’s program in printing and media technology.

Consulting priorities

The consulting focuses are as follows:

- Requirement analyses
- Interface conception
- System selection and system evaluation
- Project support

The approach is methodical, transparent, consistently provider-neutral and oriented to individual requirements.

Expert portal MELASCHUK-MEDIEN.DE

On the expert portal Melaschuk-Medien.de the interactive market overview Web-to-Publish is available as well as news and specialist articles on the topics of marketing, product communication, Web-to-Print, Web-to-Publish and Crossmedia.

Certifications

With the methodology based on the “Ecosystem Marketing and Communication” Melaschuk-Medien offers the analysis and certification for software and service providers.

A broad, constantly active communication network with suppliers, users and experts keeps our know-how up to date.

Target groups

Target groups are industrial companies, public institutions, trade, agencies, print and media service providers.

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BIBLIOGRAPHY

- Adzine (2019) Hilfe von der Maschine: Virtueller Marketingassistent überprüft Kampagnen. <https://www.adzine.de/2019/06/hilfe-von-der-maschine-virtueller-marketingassistent-ueberprueft-kampagnen/> (Access: 01.03.2022)
- Adobe (2019) Echtzeit-Kundendatenplattform. Echtzeit-Kundenerlebnis, Adobe Inc. 2019
- Adobe (2021). Gartner Magic Quadrant für Digital Experience-Plattformen 2021. <https://business.adobe.com/de/resources/reports/gartner-mq-digital-experience-platform-2021.html> (Access: 01.03.2022)
- agma Arbeitsgemeinschaft Media-Analyse e.V. (2022) ma Out-of-Home. <https://www.agma-mmc.de/media-analyse/ma-out-of-home> (Access: 01.03.2022)
- AGOF Arbeitsgemeinschaft Online-Forschung e.V. (2021) Die agof stellt sich vor. https://www.agof.de/?wpfb_dl=8555 (Access: 01.03.2022)
- AGOF Arbeitsgemeinschaft Online-Forschung e.V. (2021a) daily digital facts Oktober 2021. https://www.agof.de/?wpfb_dl=8557 (Access: 01.03.2022)
- ALM GbR (2021) die medienanstalten, Digitalisierungsbericht 2021 Video. <https://www.die-medienanstalten.de/publikationen/digitalisierungsbericht-video/digitalisierungsbericht-video-2021> (Access: 01.03.2022)
- ARD/ZDF (2021) ARD/ZDF-Medienkommission: ARD/ZDF-Onlinestudie 2021. <http://www.ard-zdf-online-studie.de> (Access: 01.03.2022)
- Beuth Verlag (2022) <https://www.beuth.de/de> (Access 01.03.2022)
- BIMI Brand Indicators for Message Identification (2021) <https://bimigroup.org/>. (Access: 15.03.2022)
- BITKOM Bundesverband Informationswirtschaft Telekommunikation und neue Medien e.V. (2020) Beliebte Helfer: Sprachassistenten haben sich durchgesetzt. <https://www.bitkom.org/Presse/Presseinformation/Beliebte-Helfer-Sprachassistenten-haben-sich-durchgesetzt> (Access: 15.03.2022)
- BITKOM Bundesverband Informationswirtschaft Telekommunikation und neue Medien e.V. (2021) 2,9 Milliarden Euro Umsatz: Deutscher App-Markt erreicht neues Rekordhoch. <https://www.bitkom.org/Presse/Presseinformation/29-Milliarden-Euro-Umsatz-Deutscher-App-Markt-neues-Rekordhoch> (Access: 15.03.2022)
- BITKOM Bundesverband Informationswirtschaft Telekommunikation und neue Medien e.V. (2021a) In der Corona-Krise greifen mehr Menschen zum E-Book. <https://www.bitkom.org/Presse/Presseinformation/Lesen-E-Books-Corona-Krise> (Access: 15.03.2022)
- BITKOM Bundesverband Informationswirtschaft Telekommunikation und neue Medien e.V. (2022) Ein Fünftel der Deutschen nutzt Virtual-Reality-Brillen. <https://www.bitkom.org/Presse/Presseinformation/Fuenftel-nutzt-Virtual-Reality-Brillen> (Access: 15.03.2022)
- BMAS Bundesministerium für Arbeit und Soziales (2021) Barrierefreiheitsstärkungsgesetz. <https://www.bmas.de/DE/Service/Gesetze-und-Gesetzesvorhaben/barrierefreiheitsstaerkungsgesetz.html> (Access: 14.01.2022)

- BMF Bundesministerium der Finanzen (2021) Umsatzsteuersatz für digitale Medien nach § 12 Absatz 2 Nummer 14 Umsatzsteuergesetz (UStG). https://www.bundesfinanzministerium.de/Content/DE/Downloads/BMF_Schreiben/Steuerarten/Umsatzsteuer/Umsatzsteuer-Anwendungserlass/2021-12-17-umsatzsteuersatz-fuer-digitale-medien-nach-paragraf-12-absatz-2-nr-14-UStG.html (Access: 30.04.2022)
- BMJV Bundesministerium für Justiz und Verbraucherschutz (2020) Gesetz über die Preisbindung für Bücher (Buchpreisbindungsgesetz). <http://www.gesetze-im-internet.de/buchprg/BJNR344810002.html> (Access: 30.04.2022)
- Braitsch, D. (2022) Google: Das kann das neue Google Ads Kampagnenformat „Performance Max“. <https://www.thomashutter.com/google-das-kann-das-neue-google-ads-kampagnenformat-performance-max/> (Access: 22.01.2022)
- Brugger, R. (2009) IT-Projekte strukturiert realisieren. Vieweg+Teubner Wiesbaden
- BSI Bundesamt für Sicherheit in der Informationstechnik (2022) Cloud Zertifizierung. https://www.bsi.bund.de/DE/Themen/Unternehmen-und-Organisationen/Informationen-und-Empfehlungen/Empfehlungen-nach-Angriffszielen/Cloud-Computing/Cloud-Zertifizierung/cloud-zertifizierung_node.html (Access: 09.02.2022)
- BVDM Bundesverband Druck und Medien e. V. (2021) Druckindustrie, Produktion & Umsatz. <https://www.bvdm-online.de/druckindustrie/produktion-umsatz/> (Access: 30.04.2022)
- BVDW Bundesverband Digitale Wirtschaft e. V. (2019) Gebühren- und Kostentransparenz im Programmatic Advertising. BVDW (Hrsg.), Berlin
- BVDW Bundesverband Digitale Wirtschaft e. V. (2019a). Qualitätsinitiative Werbewirkungsfor-schung, Guidelines für die Abbildung von Kampag-nenkontakten, Stand: 11.07.2019
- BVDW Bundesverband Digitale Wirtschaft e. V. (2019b). Code of Conduct Programmatic Adverti-sing. <https://www.bvdw.org/qualitaetszertifikate/code-of-conduct/programmatic-advertising-code-of-conduct/> (Access: 14.01.2022)
- BVDW Bundesverband Digitale Wirtschaft e. V. (2022) Programmatic Advertising. <https://www.bvdw.org/glossar/> (Access: 14.01.2022)
- Campillo-Lundbeck, S. (2021) Ein neuer Blick auf die Küche. In: Horizont 22-323/2021 vom 02.06.21, S. 20
- Campillo-Lundbeck, S. (2022) Vom Prospekt ins Metaverse. In: Horizont 1-2/2022 vom 13.01.22, S. 25
- CMC (2021) CMC Dialogpost Studie 2021. <https://alles-ueber-mailings.deutschepost.de/de/direktmarketing-wissen/studien/cmc-dialogpost-studie-2021-neukundengewinnung.html> (Access: 16.03.2022)
- CNCF Cloud Native Computing Foundation (2022) Cloud native definition. <https://www.cncf.io/about/who-we-are/> (Access: 16.03.2022)
- DDV Deutscher Dialogmarketing Verband e. V. (2022) Mobile First steht hintenan. In: DDV Dialog März 2022, S. 11
- DMARC Domain-based Message Authentication, Re-porting and Conformance (2022). <https://dmarc.org/> (Access: 16.03.2022)
- Deutsche Post AG (2021) Werbemarkt Deutschland, Dialogmarketing-Monitor, Studie 33. <https://shop.deutschepost.de/dmm-2021> (Access: 16.03.2022)
- DeepL (2019) Übersetzer. <https://www.deepl.com/translator> (Access: 16.03.2022)

- e-Spirit (2020) Headless, Hybrid & Decoupled: Eine kurze Einführung in die wichtigsten CMS-Konzepte. https://www.e-spirit.com/de/blog/headless_hybrid_und_decoupled_eine_kurze_einfuehrung_in_die_wichtigsten_cms_konzepte.html (Access: 16.03.2022)
- epic insights (2022) Zero Party Data – ein neuer Weg zur Personalisierung. <https://epic-insights.com/zero-party-data-ein-neuer-weg-zur-personalisierung/> (Access: 16.03.2022)
- FAW Fachverband Aussenwerbung e. V. (2021) Medienanalyse MA 2021 Out-of-Home. <https://faw-ev.de/mediaanalyse-ma-2021-out-of-home/> (Access: 16.03.2022)
- Forrester Research, Inc. (2021). The Forrester Wave™: Digital Experience Platforms, Q3 2021. <https://www.forrester.com/report/the-forrester-wave-tm-digital-experience-platforms-q3-2021/RES161679> (Access: 16.03.2022)
- Fraunhofer (Fraunhofer-Institut für Arbeitswirtschaft und Organisation IAO) (2022) Public, Private und Hybrid Cloud? <https://www.cloud.fraunhofer.de/de/faq/publicprivatehybrid.html> (Access: 28.12.2021)
- Gabler Wirtschaftslexikon (2022) Zielgruppe. <https://wirtschaftslexikon.gabler.de/definition/zielgruppe-48977> (Access 20.04.2022)
- Gabler Wirtschaftslexikon (2022a) Omni-Channel-Management. <https://wirtschaftslexikon.gabler.de/definition/omni-channel-management-54201> (Access: 30.04.2022)
- Gartner (2021) Gartner Magic Quadrant for Digital Experience Platforms. <https://www.gartner.com/en/documents/3995917> (Access: 14.01.2022)
- Gartner (2021a) Gartner Magic Quadrant for Ad Tech. <https://www.gartner.com/en/documents/4007307> (Access: 14.01.2022)
- Gartner (2021b) Gartner Magic Quadrant for B2B Marketing Automation Platforms. <https://www.gartner.com/en/documents/4005959/magic-quadrant-for-b2b-marketing-automation-platforms> (Access: 26.01.2022)
- Gentsch, P. (2019) Künstliche Intelligenz für Sales, Marketing und Service. Springer Fachmedien Wiesbaden, 2. Auflage 2019
- Gundelach, J. (2020) Licht ins Dunkel. In: W&V 3/2020, S. 30
- Hannig, U. Hrsg. (2021) Marketing und Sales Automation. Springer Fachmedien Wiesbaden, 2. Auflage 2021
- HDE (Handelsverband Deutschland) (2021) Online Monitor 2021. <https://einzelhandel.de/online-monitor> (Access: 30.04.2022)
- Hoffmann-Walbeck, T. et al. (2013) Standards in der Medienproduktion. Springer-Verlag Berlin Heidelberg
- Ionos (2020) Cloud Native einfach erklärt. <https://www.ionos.de/digitalguide/websites/web-entwicklung/was-ist-cloud-native/> (Access: 14.01.2022)
- Ionos (2020a) Swagger: Mehr Komfort bei der API-Entwicklung. <https://www.ionos.de/digitalguide/websites/web-entwicklung/was-ist-swagger/> (Access: 14.01.2022)
- Jahnke, K. (2021) Angriff mit Ansage. In: Horizont 46/2021 18.11.2021, S. 15
- Kirschner, R. und Pointner, G. (2018). Einführung in GraphQL. <https://entwickler.de/software-architektur/einfuehrung-in-graphql-001/> (Access: 14.01.2022)
- Knitterscheidt, K. (2022) Virtual Reality, Metaverse verhilft der VR-Branche zu einem Boom. <https://www.handelsblatt.com/technik/it-internet/virtual-reality-metaverse-verhilft-der-vr-branche-zu-einem-boom/27960162.html> In: Handelsblatt vom 12.01.2022 (Access: 30.04.2022)

- KPMG (2021) Cloud Monitor 2021. <https://hub.kpmg.de/cloud-monitor-2021> (Access: 28.12.2021)
- Lindner, R. (2021) Warum Facebook sich in Meta verwandelt – und wie das gehen soll. <https://www.faz.net/aktuell/wirtschaft/unternehmen/facebook-wird-zu-meta-warum-sich-der-konzern-umbenennt-17609515.html> In: FAZ vom 29.10.2021 (Access: 30.04.2022)
- Microsoft (2021) Microsoft to acquire Xandr to accelerate delivery of digital advertising and retail media solutions. <https://about.ads.microsoft.com/en-us/blog/post/december-2021/microsoft-to-acquire-xandr-to-accelerate-its-digital-advertising-and-retail-media-solutions> (Access: 14.03.2022)
- Mozart, F. (2022) Was Künstliche Intelligenz heute schon kann. In: W&V Januar 2022, S. 44.48
- netID (2022) European netID Foundation. <https://netid.de/> (Access: 30.05.2022)
- Nielsen Company (2021) Nielsen Werbetrend 2021. <https://www.nielsen.com/de/de/top-ten/> (Access: 09.02.2022)
- OAI (2021) OpenAPI Initiative. <https://www.openapis.org/> (Access: 14.01.2022)
- Oracle (2021) The Forrester Wave™: Digital Experience Platforms, Q3 2021. <https://www.oracle.com/cx/digital-experience-platform-forrester-wave/> (Access: 14.01.2022)
- OVK Online-Vermarkterkreis im BVDW (2019) Werbeformen. <http://www.werbeformen.de/> (Access: 14.01.2022)
- PlakaDiva (2021) Kreation trifft Media – die Gewinner 2021. Deutscher Fachverlag, Frankfurt am Main
- Roden, G. (2020) Was man über GraphQL wissen sollte. <https://www.heise.de/developer/artikel/Was-man-ueber-GraphQL-wissen-sollte-4997158.html> (Access: 14.01.2022)
- PPA (2022) Programmatic Print Allience. <https://www.programmatic-print.org/> (Access: 28.04.2022)
- Röschmann, U. (2021) Targeting mit GAFA-Daten trotz der Walled Gardens. <https://www.adzine.de/2021/10/targeting-mit-gafa-daten-trotz-der-walled-gardens/> In: Adzine.de vom 12.10.2021
- Scharrer, J. (2019) Interview mit Jochen Sengpiehl „Ich habe mich komplett durchtransformiert“. In: Horizont 35/2019, S. 10
- Schwarz, T. Hrsg. (2021) Marketing Automation. marketing-BÖRSE Waghäusel, 2. Auflage 2021
- Springer-Verlag (2019) Springer Nature veröffentlicht sein erstes maschinengeneriertes Buch. <https://www.springer.com/gp/about-springer/media/press-releases/corporateg/springer-nature-maschinen-generiertes-buch/16590072> (Access: 14.01.2022)
- Ströer (2022) Ströer stellt zukunftsicheres Targeting für digitale OOH-Kampagnen vor. <https://www.stroeer.de/newsroom/presse/stroeer-stellt-zukunftsicheres-targeting-fuer-digitale-ooh-kampagnen-vor/> (Access: 28.03.2022)
- Verimi (2022) <https://verimi.de/> (Access: 30.05.2022)
- W3C (2018) CSS Paged Media Module Level 3. <https://www.w3.org/TR/css-page-3/> (Access: 30.04.2022)
- W3C (2021) Publishing@W3C. <https://w3.org/publishing> (Access am 14.01.2022)
- Wikipedia (2020) Web-to-Print. <https://de.wikipedia.org/wiki/Web-to-Print> (Access: 30.04.2022)
- Lizenzbestimmungen: https://de.wikipedia.org/wiki/Wikipedia:Lizenzbestimmungen_Creative_Commons_Attribution-ShareAlike_3.0_Unported
- Wikipedia (2021) Cloud-Computing. https://de.wikipedia.org/wiki/Cloud_Computing (Access: 30.04.2022)

- Wikipedia (2021a) Internet der Dinge. https://de.wikipedia.org/wiki/Internet_der_Dinge (Access: 30.04.2022)
- Wikipedia (2021b) Extensible Markup Language. https://de.wikipedia.org/wiki/Extensible_Markup_Language (Access: 14.01.2022)
- Wikipedia (2021c) Progressive Web App. https://de.wikipedia.org/wiki/Progressive_Web_App (Access: 14.01.2022)
- Wikipedia (2021d) Accelerated Mobile Pages. https://de.wikipedia.org/wiki/Accelerated_Mobile_Pages (Access: 14.01.2022)
- Wikipedia (2021e) Geofencing. <https://de.wikipedia.org/wiki/Geofencing> (Access: 14.01.2022)
- Wikipedia (2022) E-Book. <https://de.wikipedia.org/wiki/E-Book> (Access: 30.04.2022)
- Wikipedia (2022a) Künstliches neuronales Netz. https://de.wikipedia.org/wiki/K%C3%BCnstliches_neuronales_Netz (Access: 14.01.2022)
- Wikipedia (2022b) Programmierschnittstelle. <https://de.wikipedia.org/wiki/Programmierschnittstelle> (Access: 14.01.2022)
- Wikipedia (2022c) Lead-Generierung. <https://de.wikipedia.org/wiki/Leadgenerierung> (Access: 27.01.2022)
- ZAW Zentralverband der deutschen Werbewirtschaft (2021) Werbung 2021. Verlag edition ZAW, Berlin
- ZAW Zentralverband der deutschen Werbewirtschaft (2021a) ZAW-Marktprognose 2021 und Ausblick 2022. <https://zaw.de/werbemarkt-erholt-sich-2021-rueckkehr-zu-vorkrisenniveau-gelingt-nicht-durchgaengig/> (Access: 08.02.2022)
- Zunke, K. (2021) Viele Alternativen, kein Ersatz. In: Absatzwirtschaft 11-2021, S. 38-41

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