LASTEN CMS SISTEM ZA VAŠO SPLETNO STRAN ALI STANDARDNA CMS REŠITEV?

IAROSLAV PARAMONOV, BORUT WERBER

Univerza v Mariboru, Fakulteta za Organizacijski vede, Kranj, Slovenija
iaroslav.paramonov@student.um.si, borut.werber@um.si

Povzetek Med procesom gradnje delujoče spletne trgovine, bloga ali česarkoli, kar ni enostransko spletno mesto, se vsi soočajo z istim vprašanjem: Kakšen sistem za upravljanje vsebin bomo uporabili? Lasten CMS ali že pripravljena CMS rešitev? Ne glede na to, koko preprosto se zdi to vprašanje, odgovor zagotovo ni. Sodobni sistemi CMS lahko izvajajo različne delovne scenarije in pokrivajo potrebo po skoraj vseh funkcionalnostih. Hkrati jih je zelo enostavno povezati, imajo ogromno vtičnikov, ki rešujejo specifične funkcionalnosti. Lasten CMS sistem je bolj odvisen od spretnosti in izkušenj razvijalca in takšna rešitev ne bo imela knjižnice vtičnikov, kar posledično podaljšuje razvoj, bo pa aplikacija veliko bolj prilagodljiva in hitrejša. Lastno izdelan CMS bo pokril vse zahteve, ki jih že pripravljen CMS ne bi mogel opraviti. V tem prispevku iščemo odgovor na vprašanje kakšen pristop izbrati in zakaj.

CUSTOM CMS SYSTEM FOR YOUR WEBSITE OR STANDARD CMS SOLUTION?

IAROSLAV PARAMONOV, BORUT WERBER

University of Maribor, Faculty of organizational sciences, Kranj, Slovenia
iaroslav.paramonov@student.um.si, borut.werber@um.si

Abstract During the process of building a working online store, blog, or anything that is not a one-page website, everyone comes to the same question: What kind of content management system will we use? Our own CMS or ready-made CMS solution? No matter how this question seems to be simple, it is not. Modern CMS systems can perform a variety of work scenarios and cover the need for almost any task. At the same time, they are very easy to connect and have a huge number of plugins that solve even more functionalities. Own CMS system is more dependent on the skill and experience of the developer, and such a solution will not have a plugin library out of the box, which in turn makes development longer, but the application will be much more flexible and faster. Own-made CMS will cover all the demands, that could not be performed by ready-made CMS. In the article, we are looking for an answer to the question of which approach to choose and why.

1   Introduction

Content Management Systems (CMS) have become an essential part of modern website development. CMS have its origins in the early days of the internet when making websites demanded a significant amount of time and technical knowledge. In the late 1990s and early 2000s, CMSs appeared as a solution to the issue of website development and management(*History of Content Management Systems and Rise of Headless CMS*, n.d.). They allow non-technical users to contribute, alter, and publish content on a website without requiring a solid understanding of programming. Today, organizations of all sizes, from small businesses to global corporations, use CMSs for a wide range of purposes. They are used to create personal blogs, corporate websites, e-commerce platforms, and much more. With so many choices on the market, CMSs have experienced a significant rise in popularity over the past several years.WordPress, Drupal, and Joomla are the three most widely used CMSs(*CMS Technologies Web Usage Distribution*, n.d.). Many organizations have also opted to use proprietary, ready-made solutions such as Squarespace, Wix, and Shopify.

Standard/Ready-made CMS solutions are pre-built systems that can be purchased and implemented with little to no custom development. Ready-made solutions offer several advantages, such as a shorter implementation time, minimal setup costs and often include basic features such as user management, content creation and analytics capabilities. Additionally, ready-made solutions often have a lower learning curve and are more user-friendly, which may be advantageous for individuals with a less technical ability(*Advantages of Using a Content Management System | Nibusinessinfo.Co.Uk*, n.d.). However, there are also certain disadvantages to ready-made solutions. The lack of flexibility caused by the features and functions being restricted to those included in the pre-built package is a significant drawback. Additionally, if an organization's requirements evolve, ready-made solutions could not be scalable. It can also lack certain integrations or security measures that a customized solution can provide.

Own/Custom CMS solutions are CMS platforms created specifically for a certain business or project(*Custom CMS vs Open Source CMS | Walker Sands*, n.d.). These solutions might have special features and functions that are not included in ready-made solutions since they are customized to the particular demands and

requirements of the company. A group of developers often collaborate to design, create, and test the system when creating a custom CMS solution. Compared to ready-made alternatives, custom CMS solutions offer a number of benefits. For instance, they provide more flexibility and control since they may be tailored to the specific requirements of the company. They also provide scalability since the system may expand and adapt as the requirements of the company change. Additionally, as they may be created with appropriate security mechanisms in place to safeguard the organization's data and content, custom CMS systems can provide greater protection. Custom CMS systems do, however, have significant disadvantages. Building a custom CMS system might be substantially more costly than adopting a ready-made solution, which is one of its key drawbacks. Additionally, a major time and resource commitment is needed to design a unique CMS system. Finally, the creation, upkeep, and updating of custom CMS systems also call for a certain amount of technological proficiency.

With the growing importance of having an online presence, the decision of whether to build a custom CMS solution or use a ready-made solution is becoming more crucial. This article's goal is to weigh the advantages and disadvantages of both possibilities and provide advice to anybody wishing to create or choose a CMS system for their website. This paper will explore the history and usage of CMSs and will present the results of a study on the experiences of organizations that have built their own CMS solutions or used ready-made solutions.

Methodology

To evaluate the effectiveness of a custom CMS versus a ready-made solution, a literature review was conducted to identify relevant studies, articles, and resources. The literature review included a comprehensive search of industry publications and online resources. A comparison was then made between the features and capabilities of popular ready-made CMS solutions and the requirements of a custom CMS. Evaluation of the two options was based on factors such as cost, flexibility, security, support, third-party application integration, and customization. The evaluation will help in determining the most suitable CMS solution for organizations.

2   Current state of Content Management Systems

It's difficult to provide an exact percentage of websites that use a CMS because the data is constantly changing, but some estimates suggest that a large majority of websites are powered by a CMS. According to a study by BuiltWith, as of 2021, approximately 60% of all websites are built using a CMS, with WordPress being the most popular choice, powering around 40% of all websites(*CMS Technologies Web Usage Distribution*, n.d.). Other popular CMSs include Joomla, Shopify and Drupal, which are estimated to be used by around 3% of websites each. It is also important to note that these statistics may vary based on the source and the popularity measurement criteria applied. Some sources may have slightly different percentages for the usage of different CMS, but all of them agree on the fact that the majority of websites are built using a CMS. It is also essential to note that these figures are continually changing as new websites are developed and current ones are updated.

2.1   Ready-made CMS solution

A ready-made CMS solution is a pre-built and pre-configured content management system that is ready to be used »out of the box«. These types of CMS are typically sold as a software product, and are designed to be easy to use and set up without the need for extensive technical knowledge. Depending on the platform, ready-made CMS systems can be either proprietary or open-source and offer a wide range of features and functionality.

The benefit of using a ready-made CMS system is that it can be quickly and easily installed, and many of them have pre-built templates, features, and functionality that make it easier to design and manage a website. They also often have a large community of users and developers, which can provide support, tutorials and additional resources. A further advantage of using ready-made CMS systems is that they are frequently updated and maintained by the developers. This means that security vulnerabilities and bugs are often detected and corrected quickly, keeping your website secure and running smoothly (*Advantages of Using a Content Management System | Nibusinessinfo.Co.Uk*, n.d.). However, it is also important to point out that ready-made CMS systems might have limits when it comes to website customization and scalability. They may not offer the same amount of flexibility and scalability as a custom CMS, and you may be constrained by the platform's features and functions

(*Custom Content Management System (CMS) Development*, n.d.).   Therefore, when deciding to choose a ready-made solution, it is essential to conduct careful research and evaluation to verify that the CMS you choose will match the unique demands and specifications of your website.

2.1.1   Ready-made CMS types

There are the most used types of ready-made CMS, each with its own set of features and capabilities.

- Traditional/Monolithic/WCMS CMS: These are single, integrated software applications that include all the necessary components to create, manage, and publish digital content(*Traditional CMS vs Headless CMS*, n.d.). Examples include:
    - WordPress: An open-source platform that is widely used for building and managing websites of all types, from small personal blogs to large e-commerce sites.
    - Joomla: Another open-source platform that is widely used for building and managing websites, particularly for small- and medium-sized businesses, government organizations, and educational institutions.
    - Drupal: Yet another open-source platform that is popular for building and managing websites, particularly for large enterprises, media companies, and government organizations.
- Headless CMS: These systems allow for the separation of the frontend and backend of a website, allowing for greater flexibility and scalability(*Traditional CMS vs Headless CMS*, n.d.). Examples include:
    - Contentful: A cloud-based headless CMS that allows developers to create and manage content and then deliver it to any platform or device.
    - Strapi: An open-source headless CMS that can be used to build and manage APIs for web and mobile applications.
    - ButterCMS: A headless CMS that allows building websites and apps using any programming language or framework.

- Cloud-based CMS: These systems are hosted in the cloud, making it easy to manage and update a website from anywhere with an internet connection(*Cloud CMS - Wikipedia*, n.d.). Examples include:
    - Squarespace: A proprietary website builder that includes a built-in CMS and is known for its design-focused approach.
    - Wix: A proprietary website builder that also includes a built-in CMS and is known for its ease of use.
    - Shopify: A proprietary e-commerce platform that includes a built-in CMS and is widely used by small and medium-sized businesses.
- Hybrid CMS: These systems combine the features of a traditional CMS with the flexibility and scalability of a headless CMS(*What Is a Hybrid CMS? | Ingeniux*, n.d.). Examples include:
    - Prismic: A hybrid CMS that allows for the separation of the frontend and backend, but also includes an integrated frontend to make it easy to create and manage the website.
    - Storyblok: another hybrid CMS that allows creation, management and delivery of content to multiple channels and devices.
- Decoupled/API-first CMS: These systems allow for the separation of the frontend and backend, but expose the data through APIs, this allows for greater flexibility and scalability, it can be used for building websites and applications for multiple devices and platforms, and also for thintegration with other systems(*Decoupled CMS - Optimizely*, n.d.). Examples include:
    - Hygraph: a decoupled/API-first CMS that offers a GraphQL API that can be used to access and manage content.
    - Sanity.io: a decoupled/API-first CMS that allows developers creation, manage and deliver content to any platform or device.

2.2 Own CMS system

An Own CMS is a software application that allows users to create, manage, and publish digital content. Unlike ready-made CMS solutions, which are pre-built and pre-configured, an Own CMS is custom-built to meet the specific needs and requirements of a website or organization(*Custom CMS: Key Features, Benefits, Development Aspects*, n.d.). Building an Own CMS involves creating the software from scratch, which allows complete control over the design, functionality and features of the system. This can be especially useful if you have unique requirements that cannot

be met by existing ready-made CMS solutions. Additionally, it can be scalable and adaptable to your future requirements.

Such CMS can be built using a variety of programming languages and frameworks, depending on the specific needs of the website or organization. It typically includes a backend system for managing content and a frontend system for displaying that content to users.

Additionally, it can be integrated with other systems and third-party services to meet your requirement.

However, building an Own CMS also comes with its own set of challenges. It can be a complex and time-consuming process that requires a significant amount of technical knowledge and expertise. It also requires careful planning, design, and development to ensure that the system meets the specific needs and requirements of your website(*Pros and Cons of a Custom Content Management System - Exelaration*, n.d.).

2.2.1   Most popular technology stacks for own CMS

There are a lot of different technology stacks that can be used to create your own Content Management System. Here are the most popular technology stacks that are used in building own CMS:

- LAMP Stack (Linux, Apache, MySQL, PHP): This stack is popular for building traditional/monolithic CMS systems.
    - Linux is the operating system,
    - Apache is the web server,
    - MySQL is the database management system, and
    - PHP is the programming language.
    This stack is widely used for building and managing websites of all types, from small personal blogs to large e-commerce sites.
- MEAN Stack (MongoDB, ExpressJS, AngularJS, Node.js): This stack is popular for building headless CMS systems.
    - MongoDB is the database management system,
    - ExpressJS is the web framework,
    - AngularJS is the front-end framework, and

        o   Node.js is the JavaScript runtime.

        This stack is widely used for building and managing web and mobile applications, particularly those that require real-time data processing and handling.

- Ruby on Rails Stack (Ruby, Rails, PostgreSQL): This stack is also popular for building traditional/monolithic CMS systems.
  - o Ruby is the programming language,
  - o Rails is the web framework and
  - o PostgreSQL is a database management system.
    This stack is widely used for building web applications, particularly those that require high scalability and performance.

- .NET Stack (C#, ASP.NET, SQL Server): This stack is popular for building traditional/monolithic CMS systems.
  - o C# is the programming language,
  - o ASP.NET is the web framework and
  - o SQL Server is the database management system.
    This stack is widely used for building enterprise level web applications and sites that require high performance and scalability.

- Django Stack (Python, Django, PostgreSQL): This stack is also popular for building traditional/monolithic CMS systems.
  - o Python is the programming language,
  - o Django is the web framework and
  - o PostgreSQL is a database management system.
    This stack is widely used for building web applications and sites with high security and scalability.

Those are the most used stacks, but in fact, during the development technologies could be changed.

3   Background of choice

From the literature review and our own experience, we could conclude that the decision of whether to build an Own CMS or use a ready-made CMS solution is typically made in the context of a specific project or website development effort.

Before deciding, it's important to assess the current capabilities of the organization, including the technical expertise and resources available, as shown in Table 1. This will help to determine if building an Own CMS is a viable option, or if using a ready-made CMS solution would be a better fit.

Identifying website requirements: The specific requirements of the website or organization will play a major role in determining whether to build an Own CMS or use a ready-made CMS solution. It's important to identify these requirements in advance, such as the number of pages, the types of content, and the scalability and performance requirements of the website.

Evaluating existing solutions: It's also important to evaluate existing ready-made CMS solutions to determine if they can meet the specific needs and requirements of the website or organization. This may involve researching and comparing different options, as well as seeking feedback from other professionals and experts in the field. Considering Maintenance and Support: Building an Own CMS requires ongoing maintenance and support to ensure that the system is secure and up to date, which can be a significant ongoing effort. On the other hand, ready-made CMS solutions are typically updated and maintained by the developers, which can be an easier option. In Table 1 we selected the most important capabilities to distinguish custom or ready-made CMS.

Table 1: List of most important capabilities

	Custom	Ready-made
Costs	Requires investments	Monthly/yearly small fee
Flexibility and scalability	Non-restricted to any company demands	Restricted by platform capability
Skills to use	Fewer skills to train	Steep learning curve
Security	Low-security risks. Allows any security standard for company demands.	High-security risks due to public availability. Also, could be a target for hacker attacks due to its popularity.
Support	The team who developed it, give fast, accurate maintenance and support.	Vendor support. Usually less tailored to a specific case.
Third-party applications	Could be connected to any additional/third-party software on demand.	Could be connected to software that is allowed by Vendor or through community plugins.
Customization	Fully customizable and could have any functionality.	Limited customization.
Website speed	Usually, own CMS, have more optimizations and includes less diversity of function, which leads to an increase in speed.	To suit the demand of the majority, have a lot of unused plugins in a specific case, which decreases the speed.

Budget and Resources: Building your own CMS can be a complex and time-consuming process that requires a significant amount of technical knowledge and expertise, which can make it a more expensive option than using a ready-made CMS solution. It's important to consider how much budget and resources are available for the project before deciding.

4   Making a decision

When it comes to deciding between building your own CMS or using a ready-made CMS solution several factors need to be considered. The specific requirements of the organization, the technical expertise, resources available, and the budget for the project. First, it's important to assess the current capabilities of the organization, including the abilities of the IT department and the human resources available. Next, it's important to identify the specific requirements of the website or organization, such as the technology stack, environment, types of content, scalability and performance requirements of the project. It's also important to evaluate ready-made CMS solutions to determine if they can meet those requirements. This may involve researching and comparing different options, as well as seeking feedback from other professionals and experts in the field. Building your Own CMS requires ongoing maintenance and support to ensure that the system is secure and up-to-date, which can be a significant ongoing effort. Finally, the budget and resources available for the project. Building an Own CMS can be a complex and time-consuming process that requires a significant amount of technical knowledge and expertise or a big amount of budget for hiring a third-party vendor who will develop it for you, which can make it a more expensive option than using a ready-made CMS solution. By considering all these factors, the organization or team responsible for the project will be able to make an informed decision about whether to build their Own CMS or use a ready-made CMS solution that best fits their needs and resources.

In Table 2 we propose factors that could help certain organizations decide which CMS they should use.

Table 2: Decision supporting factors

	Custom	Ready-made
Costs	The organization has resources to support the of custom CMS	The organization does not have enough resources to support the development of custom CMS
Flexibility and scalability	The organization has special requirements for technology stack or the way how CMS would work (using special Data transfer protocols, working in a special environment) and/or there are needs to scale for a large number of requests	The organization has no special requirements for technology stack or the way how CMS would work (using special Data transfer protocols, working in a special environment) and/or there are no needs to scale for a large number of requests
Security	The organization has a demand for advanced security layers or/and have sensitive data to manage	The organization does not have a demand for advanced security layers or/and have sensitive data to manage
Support	The organization has resources to support its own CMS for a period when it will be used	The organization has no resources to support its own CMS for a period when it will be used
Third-party applications	The organization has requirements to connect CMS to third-party services (other company's applications, payments services, tracking programs)	The organization has no requirements to connect CMS to third-party services (other company's applications, payments services, tracking programs)
Customization	The organization has special requirements for specific functionality (custom order tracking system, delivery dashboard, etc.)	The organization has not any special requirements for specific functionality (custom order tracking system, delivery dashboard, etc.)
Website speed	The organization has special requirements for response and data processing speed.	The organization has no special requirements for response and data processing speed.

5   Conclusion

In conclusion, the decision of whether to build an Own CMS or use a ready-made CMS solution is an important one that requires careful consideration of a variety of factors. The specific requirements of the website or organization, the technical expertise, and resources available, and the budget and resources for the project, are all important considerations. Building an Own CMS can provide greater flexibility and control over the design, functionality, and features of the system, and can be a good option if the website has unique requirements that cannot be met by existing ready-made CMS solutions. However, building an Own CMS also comes with its own set of challenges, including complexity, time-consuming and requires significant technical knowledge and expertise. On the other hand, using a ready-made CMS solution can be a simpler and more cost-effective option, as they are typically designed to be easy to use and set up without the need for extensive technical knowledge. It also comes with ready-made solutions for maintenance and support. In summary, the decision of whether to build an Own CMS or use a ready-made CMS solution will depend on the specific needs and requirements of the website or organization, as well as the budget, technical expertise, and resources available. It's important to research and evaluates different options to find the one that best suits your needs. If you are a small organization with limited resources, you don't need a scalable infrastructure, and have specific requirements for functionality, a ready-made CMS solution would be the best choice because it doesn't require a large investment and can usually meet your needs. On the other hand, if you are a big organization with your own IT department or have enough resources to pay the vendor to develop custom CMS for you, and have specific requirements for functionality, scalability, technology stack and security then your choice will be custom CMS. In case you are somewhere between, you can use the table provided in the previous chapter to decide.

Literature

Advantages of using a content management system | nibusinessinfo.co.uk. (n.d.). Retrieved January 17, 2023, from https://www.nibusinessinfo.co.uk/content/advantages-using-content-management-system

Cloud CMS - Wikipedia. (n.d.). Retrieved January 17, 2023, from https://en.wikipedia.org/wiki/Cloud_CMS

CMS technologies Web Usage Distribution. (n.d.). Retrieved January 17, 2023, from https://trends.builtwith.com/cms

Custom CMS: Key Features, Benefits, Development Aspects. (n.d.). Retrieved January 17, 2023, from https://www.scnsoft.com/software-development/custom/cms

Custom CMS vs Open Source CMS | Walker Sands. (n.d.). Retrieved January 18, 2023, from https://www.walkersands.com/custom-cms-vs-open-source-cms/

Custom Content Management System (CMS) Development. (n.d.). Retrieved January 17, 2023, from https://www.npgroup.net/services/development/custom-content-management-system-development/

Decoupled CMS - Optimizely. (n.d.). Retrieved January 17, 2023, from https://www.optimizely.com/optimization-glossary/decoupled-cms/

History of Content Management Systems and Rise of Headless CMS. (n.d.). Retrieved January 17, 2023, from https://www.contentstack.com/blog/all-about-headless/content-management-systems-history-and-headless-cms/

Pros and Cons of a Custom Content Management System - Exelaration. (n.d.). Retrieved January 17, 2023, from https://exelaration.com/blogs/pros-and-cons-of-a-custom-content-management-system/

Traditional CMS vs Headless CMS. (n.d.). Retrieved January 17, 2023, from https://www.udig.com/digging-in/traditional-cms-vs-headless-cms/

What is a Hybrid CMS? | Ingeniux. (n.d.). Retrieved January 17, 2023, from https://www.ingeniux.com/blog/what-is-a-hybrid-cms