

Design Systems Applied to Visual Identities



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Abstract Today, brands relate to users through an ever-expanding network of online and offline channels, making design systems essential for maintaining visual identity, growth and brand recall. These frameworks combine design rules, reusable modules and established standards, simplifying processes and ensuring the alignment of different teams and devices. This paper traces the development and practical use of Design Systems in shaping Brand Visual Identities, arguing that they evolve into comprehensive Brand Visual Language Systems that unify directives, digital assets and operational workflows. The article combines an organized literature review with a detailed comparative case study of pioneering brand center solutions, namely Frontify, Bynder and Adobe Experience Manager Assets. The results indicate that companies are increasingly combining design systems with digital asset management to master the growing complexities of brand consistency in rapidly evolving global markets. The research highlights effective approaches while identifying existing gaps, demonstrating that flexible Brand Centers, supported by comprehensive Design Systems, improve teamwork, safeguard brand consistency and support rapid adjustments to evolving communication needs. By linking design, engineering and governance, these configurations increase operational efficiency, boost productivity and cultivate lasting innovation in brand management. As such, the findings offer practical guidance for brand leaders, visual designers and academic researchers seeking to strengthen visual identity management amid the dynamics of digital transformation.

Keywords Brand design systems · Brand management · Brand visual identities · Brand centers · Digital asset management

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1 Introduction

A Design System is a set of components, rules, selection and design criteria and style that, when put together, determine appearance, design pattern or language which ensure the production of consistent products.

Through Design Systems you can speed up the design process and allow different people to design consistent and coherent products, facilitating scaling using design patterns and standards that use defined components and can be tested and applied more quickly [1].

As a concept and practice, the Design systems have evolved significantly, keeping pace with constant technological innovation and the growing demand for efficient and scalable solutions in the development of products, services and brands. These systems play a fundamental role in the modern design of brands and the experience of their target audience, providing a comprehensive set of guidelines, principles and resources that ensure consistency, efficiency, scalability, customer recognition, accessibility and innovation across all digital and analog platforms.

From the earliest days of visual communication to today's most sophisticated digital processes, design systems have shaped the way we organize and standardize the visual identity of brands. With historical roots dating back to the era of printing and industrialization, these systems have gained even more relevance with the rise of the digital world in the business context.

Design Systems was inspired by general systems theory, developed by the biologist Ludwig von Bertalanffy and others from the 1930s onwards to explain abstract and physical concepts or realities, with the aim of visualizing and facilitating the understanding and application of knowledge. Although less well known, this concept is also called Atomic Design in association with the composition of matter to form complex organisms (atoms, molecules, organisms, templates and artefacts or pages). In the context of communication design, the concept of System is often used to explain the visual identity of a brand and in User Experience Design it is used to identify, categorize and define design principles that determine the appearance and visual language of a coherent system [2].

Generally speaking, Design Systems is a theoretical and practical concept that results from combining graphic design resources with technological possibilities to respond to brand communication demands.

In the context of Visual Brand Identity, Design Systems seems to be gaining public expression with the transformation of Brand Guidelines, Brand Manuals and Brand Books into Brand Centers, as a response to the digital transformation, adapting to international markets with greater communication needs in terms of quantity of messages and number of media. According to [3] Brand Centers are digital platforms that make it possible to group, organize and manage all the documents, strategy, guidelines, graphic materials, multimedia banks, templates, pre-print files, information and data that are essential for brand marketing and communication and that are needed by internal and external personnel.

The emergence of tools such as Figma and the development of Design Systems 2.0 represent a transition from static approaches to dynamic and customizable methodologies. This evolution makes it possible to create adaptable and consistent experiences in different contexts. As such, design systems not only increase productivity and collaboration, but also play a crucial role in consolidating companies' visual identity and continuous innovation.

In this essay, we will explore the definition of design systems and their importance in maintaining brand consistency, adapting to new digital platforms and increasing brand value, using the explanatory case study methodology referred to by [4], in order to understand how Design Systems, especially Brand Centres, contribute to the consistency and adaptation of the visual identity of brands in the context of digital transformation.

The aim is to analyse the evolution of Design Systems in the context of the visual identity of brands and their adaptation to the digital environment. As well as investigating the effectiveness of Brand Centres as platforms for guaranteeing the visual consistency of brands in different media and their contribution to continuous innovation.

2 A Brief History of Design Systems

Design systems have played an important role in human innovation since the dawn of civilisation. Since the Stone Age, people have applied systematic thinking to their activities, from weaving baskets, producing textiles, hunting tools or even jewellery.

These ancient practices involved repeating patterns, applying symmetry, balance and proportion, even without the use of formal geometry. Our ancestors sought to create consistency, order and beauty in their work, something we still strive for today.

One of the most significant milestones in the modern era was the invention of printing. The invention of movable type is attributed to Gutenberg in 1440, but it was already being developed in Korea, albeit in a more limited and less systematic way. This attribution to Gutenberg, a goldsmith by trade, was due to the improvement of the metal alloys needed for the mass production of precisely cast letters that made movable type viable on a large scale [5, 6].

As [7] points out, with the proliferation of steam presses, there was an exponential increase in the production of printed materials, which facilitated the reproduction of common phrases, images and patterns. Essential elements that profoundly influenced cultural language and stereotypes, contributing to cultural clichés. As certain ideas or expressions began to be conveyed more frequently by the press, they ended up becoming more firmly rooted in the collective consciousness. The rapid dissemination of content gave rise to the concept of “stereotyping”, both in the literal sense, through the use of metal “stereotype” plates for rapid reproduction on printing presses, and in the figurative sense known today. This mechanisation of reproduction also contributed to an excessive use of familiar narratives, fixing them firmly in the collective mind. The concept of “cliché” transcended simple block repetitions in

print. It has become not only a common vocabulary word, but also a real threat to society.

In 1570, Palladio's 'Four Books of Architecture' presented one of the first cases of systems, including principles and patterns for architectural project [8]. In the same sense, in his book on architecture, "The Timeless Way of Building and A Pattern Language", de 1979, Christopher Alexander presented the concept of pattern design, to refer to a recurring or reusable solution that can be customized and applied to different contexts. In the same sense, a visual identity can be made with pattern designs that can be used in similar, but not identical, situations and contexts, ensuring recognition, familiarity and consistency, but also allowing you to design more products more quickly [8].

Throughout history, we can identify similar patterns of scalability. A classic example is the case of Henry Ford, who although he wasn't the inventor of the automobile, revolutionised it by introducing the assembly line methodology. Ford's innovation was not just limited to the product itself, but to the efficient and scalable system that made the car viable as a product [9].

These examples highlight the importance of innovation and technological development in making products viable and scalable throughout history. But all new technologies have encountered resistance throughout history. The same happened with the first cars in relation to horses.

At the beginning of the twentieth century, the arrival of mechanical assembly lines was criticised by traditional craftsmen in various sectors, who feared the loss of quality in mass-produced products and consequently the loss of their trades.

It was during the first decades of the twentieth century that the first visual identity systems began to emerge, but they were still small, mainly limited to stationary and a few other applications that varied according to the brand's needs. Examples of this are projects by modernist designers such as Wilhelm Deffke, Karl Bülmann, Hans Karl Michel, Otto Firl e Kurt Schwitters, among others [10].

The terms used in today's digital design, such as "typeface", "font", "interline" and "alignment", have their roots in the printing era. Although they derive from physical printing processes, these terms are still widely used in contemporary design. However, they are often not the most appropriate when it comes to describing digital experiences, such as the use of "page" or "screen". The persistence of print vocabulary in digital design highlights the profound influence that print culture exerts on our understanding of visual communication, even with the transition to digital media [7].

This not only reflects technological advances in communication but also emphasises the historical and cultural importance of the print era within contemporary design. Revealing the complexity of technological evolution and underlining how print culture has shaped our understanding and practice of visual design today.

Between the late 1950s and the 1970s, the expansion of multinational companies and the Olympic Games favoured the development of visual brand identity systems which, also benefiting from modernist thinking and design, became more complex, complete, coherent and consistent. The complexity and scale of visual identity elements, media and communication artefacts reached a huge number, as can be

seen in the cases of the Olivetti, Deutsch Lufthansa, Mexico 1968 Olympic Games e Mexico 1968 Olympic Games, Munich 1972 Olympic Games and IBM design [11].

From a technology perspective, in 1968, Douglas McIlroy presented a proposal at a NATO software engineering conference to accelerate the potential of programming and its scalability by making code reusable, which exponentially accelerated innovation in this field [1].

As [7] points out, the 1990s saw a significant leap in digital design with the advance of computers and browsers. Teams began to share reusable standards to create their own design systems, but their adoption was initially slow due to designers concentrating on visual components only.

Despite technological advances, many designers were still stuck in a print-focused mindset. Documents were seen as static pages. Designers used to print out layouts and post them on walls for review. It was only with the widespread adoption of platforms such as Material Design, Storybook and Zeroheight that product teams began to migrate to digital workflows.

In this context, Brad Frost played a key role in documenting and standardising the practice of design systems. Frost [12] proposed a methodology capable of transforming the way we design digital, adaptable and cohesive interfaces.

This approach is based on breaking down interfaces into smaller components (atoms, molecules, organisms, templates and pages), allowing design elements to be better understood and reused, and can be applied systematically to all projects. This standardisation was extremely necessary at the time, when design had little influence in organisations and was often underestimated as a “cosmetic” aspect of product engineering.

The evolution of design tools played a key role in improving efficiency and collaboration in this process.

Over time, design systems have evolved to deal with existing constraints and to overcome the separation between design and development. With the need for scalable design in the digital context, new software and workflows have emerged.

In the last decade, we have seen a significant change with an increase in creativity on the web, driven by social networks and accessible technology.

The impacts of the rise of the Figma application as a design tool have been widely documented. Figma has emerged as a popular choice in interface design due to its comprehensive and integrated approach. By uniting design, prototyping and real-time collaboration capabilities, Figma has solved communication challenges between teams, promoting a more fluid and efficient experience. This transformation not only revolutionised design technology but also set a new industry standard by facilitating effective collaboration between designers, engineers and other stakeholders. Figma quickly became a favourite over other applications and software such as Sketch, InVision and even Adobe XD, thanks to its cloud-native architecture and ease of use [13].

During the COVID-19 pandemic, companies have increasingly adopted digital platforms to facilitate remote collaboration. Tools such as Slack, Zoom and Microsoft Teams gained popularity for holding virtual meetings and teamwork. The use of the cloud as real-time shared storage also became widespread, ensuring that systems

could support a global workforce operating from home. Companies realised that they could bring together talent from different locations and work effectively remotely.

But Figma didn't just revolutionise UI design. It also introduced FigJam, a virtual whiteboard that facilitates brainstorming and ideation in real time. This tool is not just restricted to designers, but is accessible to all team members, including marketing professionals and programmers. Figma has become an indispensable tool for entire teams, making it possible to centralise research, knowledge and design in a single place, thus increasing efficiency and the reuse of team resources. In this way, Figma has established itself as a leader in the design market.

In 2021, Figma introduced Variables, which replaced Styles and became a crucial innovation in this regard.

Variables allowed designers to assign tokens to brand attributes, facilitating synchronisation with developer kits, as defined in Material Design. This approach enables Figma to manage dynamic content and themes, such as dark and light modes or multi-brand systems. This possibility of assigning tokens represented a significant leap forward in terms of productivity, allowing designers and developers to control the look of interfaces in real time.

The integration of design and development has been a key objective since the transition to digital media. With a style guide condensed into a single data sheet managed by Figma, changes to the user interface can be made separately from the front-end work.

In addition, the developer kits allow Figma to model objects and components with similar semantic precision to the front-end. This approach further strengthens Figma's role as a reliable source for design.

In parallel with Figma's evolution, Digital Assets Management (DAM) has migrated to the cloud, enabling remote access, real-time collaboration and automatic backups.

Burchill [14] states that this type of system establishes itself as the single, undisputed source of its digital assets, assuming it as the fundamental core of all its visual content. This practice describes the accommodation and ordering of your digital assets in a solution developed specifically to manage these resources. These systems facilitate the management, search and implementation of your digital files in your marketing channels.

One of the most significant benefits of the DAM system is the saving of time and financial resources. It should be considered as a specialised search engine for visual content. Minimising the time spent searching for digital assets frees up space for content creation, campaign planning and the effective fulfilment of other obligations inherent to professional activity.

Another significant advantage of DAM is brand image protection. Many DAM service providers focus on "brand integrity", a crucial element in brand management. The availability of suitable, high-quality images guarantees an optimised experience for customers, thus helping to protect the brand's reputation.

It's common for emerging brands to collaborate with external teams to create creative assets, run campaigns and produce content. With the help of the DAM system, this process becomes more agile and efficient, since all operations can be

carried out within the application itself. This feature speeds up the approval process and facilitates collaboration with agencies, freelancers and creators.

Nowadays, companies are facing increasing pressure to innovate quickly in the digital transformation, whether they are large or small [15].

In other words, Digital Asset Management can lead to significant savings in time and money, protect brand image and simplify collaboration with external teams. It is undoubtedly a valuable tool for any organisation that wants to manage its digital assets effectively.

Design Systems with Digital Asset Management integration play a crucial role in this process, enabling integrated and scalable solutions that balance innovation and efficiency. Previously static, these systems have evolved into dynamic structures that link design and development, improving collaboration between teams and providing consistent experiences on a large scale.

This change reflects broader technological and business transformations, influencing designers' practices and organisational approaches to problem-solving. This working procedure is now essential for managing large-scale design in companies. The convergence between design and development facilitated by collaborative tools allows teams to work faster and more efficiently, implementing design decisions with less risk.

3 Importance of Design Systems in the Creation and Management of Visual Identities

The current concept of Design Systems represents the evolution and consolidation of these practices, representing a crucial milestone in the development and implementation of successful products, services and brands. These systems encompass not only tangible elements, such as essential tools and visual standards, but also intangible components, such as brand values and working methodologies.

A Design System goes beyond simple guidelines; it is a complete product that optimises the work of everyone involved in the project. It should be developed iteratively, always with the users' needs in mind. The more it is integrated into the daily lives of everyone involved in the brand perception management process, the more effective it will be. There are tools available to ensure that the system is not just a reference, but a practical, everyday tool that increases productivity and promotes consistency in the final products [16].

As [7] says, as companies evolve digitally, it is becoming increasingly clear that design systems play a crucial role in preserving brand value and ensuring a cohesive digital presence. Their role goes beyond mere efficiency, and they are essential for consolidating and strengthening companies' visual identity in the online environment.

It turned out that Design Systems went beyond a simple design trend. They highlighted a gap in communication between multidisciplinary teams, namely brand

managers, designers and developers, which had been observed for a long time and has gained prominence in recent years.

This growing need for standardisation in design arises especially with the transition to digital strategies, making Design Systems even more relevant. They bridge the gap between the printed and digital worlds, establishing a common language that evolves over time. Supported by modern tools, they facilitate the efficient creation and sharing of components. With this progress, companies, especially small and medium-sized enterprises (SMEs), have changed their approach to digital strategies. Today, platforms are not merely support tools, but the core of the product offering, enabling autonomous content management through a content management system (CMS). This transformation has enabled companies to gain control over their digital ecosystems, giving them a competitive edge in the market.

According to [17], Design Systems are a complete source that brings together all the elements necessary for teams to successfully design, implement and develop a product. Both [16, 17] agree that a Design System is an approach that aims to standardise and facilitate the entire creative and productive process in building a product, service or brand.

Exploring Design Systems reveals the importance of defining clear objectives and shared values before implementation. Design principles guide creative decisions, while brand identity encompasses all the visual elements that define it. The components and standards act as fundamental blocks in the design and development process.

In other words, a Design System is a comprehensive source that guides and unifies the creative and production process.

Recent advances in the Figma platform have revolutionised the way design standards are conceived. Now, instead of rigid and static structures, dynamic and highly customisable products are emerging, under the heading of Design Systems 2.0. These systems are not limited to mere design models—they are flexible and based on usability standards. This means that design can evolve continuously, without being trapped in predefined visuals or fixed components.

Gulsen [13] says that Design Systems 2.0 stand out for their ability to be updated, which is one of their greatest assets. When changes are made to a specific element, they can be quickly propagated to all the interfaces in which that element is used, guaranteeing consistency, speed and precision in design updates. This automation not only reduces manual labour but also ensures a more robust user experience across multiple touchpoints.

In addition, the advanced customisation provided by a dynamic design system makes it possible to create personalised experiences for each user. The integration of customer data allows designers to programmatically adjust interface elements, such as colour schemes, content layout or product recommendations, based on individual preferences and behaviour. The standardised code structure makes it easy to integrate these personalised elements into the overall design structure without creating conflicts or inconsistencies.

It is expected that these systems will become more sophisticated, possibly using Artificial Intelligence to automate and improve design processes [18, 19]. This

evolution will allow designers and developers to focus on more complex creative challenges, confident that the fundamental elements of their projects are solidly structured.

The flexibility of Design Systems 2.0 also boosts the efficiency of A/B testing. Thanks to the modularity and standardisation of design elements at code level, designers can test multiple variations quickly without the need to create new models or assets. This way, teams can experiment with different design patterns and content strategies, collect performance data and implement changes quickly. As Checker [16] points out, adopting design systems isn't just about incorporating new tools or processes, it's about transitioning to a structured and flexible approach to design. This approach can revolutionise companies' iterative processes, making it possible to quickly optimise interfaces based on user feedback.

If we focus on the challenges facing companies today, we realise that the points of contact have multiplied in the last decade, as have the elements and supports [20–22]. This proliferation demands a robust design system to maintain brand coherence. With this demand, it is increasingly common for there to be internal and external players, making the management process complex, difficult to organise and available to teams at any time. It is essential for these teams to have an integrated, continuous and informed view of all the brand management processes to ensure that the brand experience is consistent, actively contributing to embodying the company's purpose and value proposition.

In other words, the brand is the memory in a consumer's mind. In saying this, we are emphasising the need for the brand to create experiences so that consumers create a brand image in their minds in the right way, whether it's in the experience of consuming the products, the impact of communication, the opinion of a third party on social media or the presence of the products in places of sale [23].

In this respect, brand management is an increasingly complex process, always taking visual perception as its starting point.

On the contemporary stage of visual brand identities, design systems are emerging with increasing vigour, shaping traditional Brand Guidelines, Brand Manuals and Brand Books, which are static documents, into innovative digital BrandCenters that allow dynamic updates, with remote access, customisation of content by market and integrations with other asset management and content creation tools.

These BrandCenters allow companies to control their visual assets, brand guidelines and communication materials in an integrated way, ensuring the coherence of the corporate image in different markets and channels.

As Aggylon [24] says, BrandCenters are like catalysts in the effective management of a brand, performing remarkable functions. One of their main features is the centralisation of resources. A single platform brings together all the brand's assets, including visual identity manuals, digital assets (such as graphic brands, typography, images and videos), communication templates and application guidelines. This grouping facilitates the accessibility and use of these resources by various teams within the organisation, as well as subcontractors, eliminating redundancy of effort.

Using this type of centralised platform ensures robust consistency in all communications and interactions with the public across all channels. This congruence

strengthens the brand's identity and ensures that the value proposition is conveyed uniformly, reinforcing a cohesive and consistent image over time.

BrandCenters strive to increase efficiency and productivity by automating workflows and facilitating access to materials. This facility reduces the time spent searching for assets, directing teams to more strategic tasks. In addition, they foster collaboration between different departments by providing universal access to the same guidelines and materials, encouraging joint work and the sharing of best practices.

With centrally managed data and assets, managers get a comprehensive and clear view of the state of the brand. This overview helps them make more informed and strategic decisions. It also promotes the autonomous management of brand components by teams, reducing response times and, consequently, the costs associated with inefficient processes or hiring external resources to create materials.

In other words, BrandCenters are essential for maximising the value of brands and strengthening their presence on the market. They ensure more effective and relevant management of corporate identities.

Many are based on Design Systems, which are both structured and flexible, adapting to different variations quickly without the need to create new models. They are based on performance data, enabling changes to be implemented quickly or even in real time.

As Summa [3] points out, the absence of appropriate tools results in various adversities faced by brand managers, who are forced to invest an excessive amount of time in carrying out mechanical tasks and rectifying errors or inconsistent implementations. This scenario often results in project delays and budget overruns, as well as the implicit danger of potentially damaging the brand's reputation.

4 Cases Studies

Various platforms offer Brand Centre solutions with different characteristics. The digital Brand Center platforms analysed: Frontify, Bynder, Brandfolder, Acquia DAM, Aggylon, Adobe Experience Manager Assets, Canto and MediaValet play a central role in the integrated management of brands' visual identity, particularly in the integration between Brand Center and Digital Asset Management (DAM), responding to the growing complexity of digital ecosystems and the need for consistency in communications. Although each solution has unique features, there is a set of transversal functionalities that define the state of the art in these tools (Table 1).

Common Features

All the tools promote the centralisation of digital assets (graphic marks, typography, colour palettes, templates, promotional materials, among others) in a unified online repository, favouring accessibility and the continuous updating of brand guidelines. This centralisation is supported by robust Digital Asset Management (DAM) systems,

Table 1 Comparative summary of Brand Centre digital platforms

Criterion	Frontify	Bynder	Brandfolder	Acquia DAM	Aggylon	Adobe experience manager assets	Canto	MediaValet
Main Focus	Branding, interactive guidelines	DAM + Brand Guidelines balanced	DAM (rapid asset management)	Technical DAM and asset security	Brand governance and compliance	Asset management integrated with the Digital Experience	Simple and efficient DAM for SMEs	Enterprise DAM with a focus on security and performance
Dynamic Guidelines	Excellent	Good	Limited	Basic	Excellent (modular)	Yes, highly customisable	Limited, document-oriented	Yes, with customised brand portals
Digital Asset Management (DAM)	Good	Very strong	Extremely robust	Robust	–	Yes, high performance DAM	Yes, simple and functional DAM	Yes, high-security enterprise DAM
Template Customisation	Flexible and easy	Available, but with limitations	Limited	Unintuitive	Flexible and automated	Yes, with Dynamic Media	Not native (depends on integrations)	Limited, more focused on asset management
Campaign Management	Limited (basic projects)	Integrated (marketing workflow)	Not a focus	Partial	Strong (campaign control)	Yes, with Adobe Campaign (optional)	Limited	Limited
Governance and Compliance	Medium (control by permissions)	Strong (approval workflows)	Basic	Strong	Very strong (detailed control)	Very high, focused on global compliance	Good, with basic permissions	Very high, with compliance (SOC 2, GDPR)

(continued)

Table 1 (continued)

Criterion	Frontify	Bynder	Brandfolder	Acquia DAM	Aggylon	Adobe experience manager assets	Canto	MediaValet
Collaboration and Feedback	Integrated and fluid	Integrated	Simple	Integrated	Integrated (comments and approvals)	Yes, advanced collaboration	Simple, annotations and markings	Yes, with annotation and asset approval
External Integrations	Many (Adobe, Slack, etc.)	Many (Salesforce, Adobe, etc.)	Basic (Google, Adobe)	Extensive (CMSs, Salesforce)	Customisable (bespoke)	Very broad: Adobe suite, AEM, Salesforce	Basic: Adobe CC, CMSs	Broad: Adobe CC, Microsoft 365, CMSs
Global Scalability	High	High	High	High	High	Very high, Adobe cloud and global CDN	Medium, aimed at SMEs	Very high, Microsoft Azure backbone
Ideal Audience	Creative and agile brands	Medium/large companies	Teams that need DAM agility	Large organisations with strong IT	Companies with a strong marketing structure	Global companies with an advanced digital focus	SMEs and small marketing teams	Large companies and regulated sectors
Companies examples	Nestlé, Budweiser, Grubhub, Tony's Chocolonely, Bosch, Mercedes-Benz, Vodafone,	Five Guys, Alpro, Puma, Spotify, Canon	Russell Stover, Portillo's, Bakers Delight, Vermont Cider Co., Lyft, Mastercard, Panasonic	New Balance, Energizer	Heineken, Puratos, Ajinomoto	Philips, Mastercard, Nissan	Harvard University, Ralph Lauren	Experian, Visit Orlando, Hard Rock

which ensure the safe storage, efficient organisation and rapid retrieval of content through search mechanisms structured on metadata, categories and keywords.

Ease of use between the platforms emerges as a common denominator between the solutions, albeit with variations in the degree of complexity, depending on the profile of the users, be they designers, marketing professionals or commercial teams. Frontify [25] stands out for its minimalist interface and low learning curve, favouring rapid adoption even by users with limited technical skills. Similarly, Bynder [26] provides a fluid user experience, albeit with a slight additional complexity due to the range of functionalities it integrates. Brandfolder [27] focuses on operational simplicity, optimising the speed of access and asset sharing, and is particularly suited to marketing teams who value agile solutions. Canto [28] and MediaValet [29] also show a strong commitment to usability, offering intuitive navigation and simplified onboarding processes, albeit with more restricted customisation resources. On the other hand, platforms such as Acquia [30], Aggylon [31] and Adobe Experience Manager Assets [32] are initially more complex, requiring specialised training and are therefore more suitable for organisations with dedicated technical teams.

Interdepartmental collaboration is encouraged across the board by the platforms, either through the possibility of direct comments and reviews on assets, or through the implementation of structured approval flows. At the same time, the management of granular permissions, covering different levels of viewing, editing and downloading, ensures the integrity of information and the protection of digital assets.

In the area of creating communication materials, there is also convergence: all the solutions analysed offer pre-configured templates that democratise content production, allowing non-specialist users to generate materials in line with the brand's visual identity. Frontify leads the way in this regard, offering an advanced Template Library that enables the creation, customisation and dynamic management of templates, without relying on ongoing technical support. This feature reinforces user autonomy and guarantees brand consistency on a large scale. Bynder also has solid template customisation capabilities, integrated with approval flows and brand identity rules, which makes it especially suitable for organisations with decentralised marketing structures. Brandfolder and Canto, on the other hand, offer more basic template functionalities, satisfying standardised needs, but with less dynamism and advanced customisation. Adobe Experience Manager Assets stands out for its ability to create highly personalised templates and for its native integration with the rest of the Adobe suite, although it does require specialised technical skills for its initial configuration. Acquia DAM, Aggylon and MediaValet, on the other hand, offer more limited customisation options, focusing mainly on the management, security and efficient distribution of assets, to the detriment of the dynamic creation of new materials.

Integrations with external systems are another important differentiating factor. All platforms offer connectors to widely used tools such as Adobe Creative Cloud, Salesforce, WordPress and Microsoft 365. However, there is variation in the depth and breadth of these integrations. Bynder, Adobe Experience Manager Assets and MediaValet present particularly robust integration ecosystems, supporting complex workflows and reducing information silos within organisations. Frontify also shows

good integration capabilities, especially with creative platforms and content management systems (CMS), although with a greater emphasis on personalisation geared towards brand environments. Brandfolder and Canto offer effective integrations for less complex business scenarios. Acquia DAM stands out for its optimisation for the Drupal ecosystem, while Aggylon favours integrations with document management systems, internal workflows and compliance platforms, which makes it especially attractive for legal and regulatory environments.

Analysing metrics and reports on asset performance (such as downloads, views and engagement levels) is a cross-cutting feature, offering support for evaluating the effectiveness of brand management strategies.

Regarding the pricing model, there is a wide range, directly proportional to the functional depth, customisation capacity and scalability of the solutions. Frontify and Bynder are positioned in the medium to high price range, justified by the integration of comprehensive functionalities such as DAM, dynamic Brand Guidelines and advanced template management. Brandfolder and Canto, on the other hand, offer more affordable models aimed at small and medium-sized companies looking for effective solutions, albeit with less functional complexity. MediaValet has adopted a competitive strategy aimed at organisations that manage large volumes of assets and users. Acquia DAM, Aggylon and Adobe Experience Manager Assets represent larger investments, suitable for multinationals and institutions with strict requirements in terms of compliance, integration and scalability.

It should also be noted that most platforms offer modular and scalable plans, making it possible to adapt the solution to the volume of assets, the number of users and the specific integrations required by each organisation.

Differentiating Features

Despite these common functionalities, each platform is distinguished by specific features that respond to different needs:

Frontify stands out for its strong orientation towards creative collaboration, with direct feedback tools on assets and editing based on flexible templates. Its scalability makes it particularly effective for global brands with decentralised operations.

Bynder is characterised by the breadth of its technological integration, offering deep connections with CRM platforms, project management and content networks. The platform is particularly suitable for rebranding operations, new brand launches and international expansion, reinforcing the simultaneous management of local and global identities.

Brandfolder differentiates itself through its highly intuitive interface and advanced analytical functions, which not only make it possible to manage but also to measure the performance of digital assets. The possibility of creating independent brand portals, adaptable to specific markets, gives it great flexibility for companies expanding geographically.

Acquia DAM integrates digital asset management with product information management (PIM), enabling a broader approach that covers not only visual communication elements, but also technical data associated with products. Its ability to

create personalised brand portals suitable for different audiences represents a robust solution for large companies and diversified industrial sectors.

Aggylon, for its part, focuses intensely on the user experience, promoting decentralised management that allows local adaptations without distorting the brand's global identity. It stands out for its dynamic guidelines model (replacing static manuals) and its versatility for multicultural organisations or franchising networks.

In short, the digital Brand Centre platforms studied reflect the evolution of contemporary visual identity management needs, characterised by convergence in essential functionalities, but also by strategic differentiation in terms of scalability, technological integration, analytical management and flexibility to adapt to different markets. The choice of the most suitable platform will therefore depend on the organisation's digital maturity, the complexity of its markets and its strategic priorities in terms of collaboration, product management or personalisation of the brand experience.

5 Conclusions

Undeniably, the last decade has been a period of significant change in the world of design systems, which has had a profound impact on traditional workflows. The emergence of platforms such as Figma, the incorporation of cloud-based structures and the exponential growth of remote working have redesigned the way design teams operate and how digital experiences are created.

However, this evolving scenario has brought with it new challenges for organisations. There are companies that continue to operate with outdated infrastructures that are incompatible with modern design systems. It is imperative to replace these obsolete systems with newer structures in order to stimulate innovation and maintain competitiveness.

The use of Design Systems is crucial in the creation and management of visual identities for products, services and brands. They act as a comprehensive guide that standardises the creative and production process, establishing a bridge between the printed and digital worlds. Design systems play a key role in preserving brand value and ensuring a cohesive digital presence as companies evolve digitally. They also facilitate the efficient creation and sharing of components, thereby boosting productivity.

With design systems gaining prominence in business operations, it is vital to maintain cohesion between teams to ensure the smooth running of dynamic systems. Clear standards and well-defined processes are key to avoiding the fragmentation of design efforts, and it is essential to transform static Brand Manuals into digital and dynamic BrandCenters, with simple principles, up-to-date information and Digital Asset Management.

As design systems evolve, teams need to adapt their skills. Designers will have to become more familiar with data, automation and real-time interfaces, while managers will need to better understand design workflows.

With the advance of design systems, the approach to publishing is also being redefined. Content is becoming more fluid, dynamic and sensitive to user interactions and real-time environments. Organisations must adopt flexible approaches that allow content and design to evolve together.

Despite the growing adoption of the Atomic Design methodology, there are gaps in its practical implementation in organisations, where collaboration between teams can be challenging. The lack of appropriate documentation and training is a major limitation.

It is essential to foster knowledge within organisations to implement Design Systems, along with exploring tools such as Brand Centres that facilitate collaboration and communication between multicultural teams.

The results of these processes have significant implications for design practice, suggesting a paradigmatic shift in the way brand managers, designers, marketers, sales people and developers collaborate and communicate.

The lessons learned from past innovations will be crucial as organisations expand the horizons of the potential of design systems. Those able to embrace more dynamic, integrated and collaborative mindsets will thrive in this ever-evolving landscape. The future of design systems lies in their ability to adapt, personalise and improve user experiences in the new landscape.

Several Brand Centre platforms were analysed and it was found that they all promote the centralisation of digital assets in a unified online repository and have robust DAM systems, with a focus on identity consistency and coherence. However, each platform is characterised by specific features that respond to different needs. The choice of the most suitable platform will depend on the digital maturity of each company, the complexity of its markets and its strategic priorities in terms of collaboration, product management or personalisation of the brand experience.

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