

Designing contextual solutions and applications

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Introduction

In the last two decades, there has been unprecedented growth in the amount of information at people's disposal. Information is now readily discoverable from a wide array of channels, new types of devices, and delivery platforms. At heart of this explosion are consumers that demand content no matter where they are and a technology industry that creates newer devices and services to satisfy them. While this situation serves consumers well, it presents an enormous challenge to those who produce content. A newspaper, for example, no longer only needs a website in addition to its printed paper, but it also must deliver its content on mobile devices, e-readers, social networks, offline kiosks, and so on. In addition, it needs consistent and coordinated marketing campaigns on different advertising media to drive users to consume its product and stay engaged.

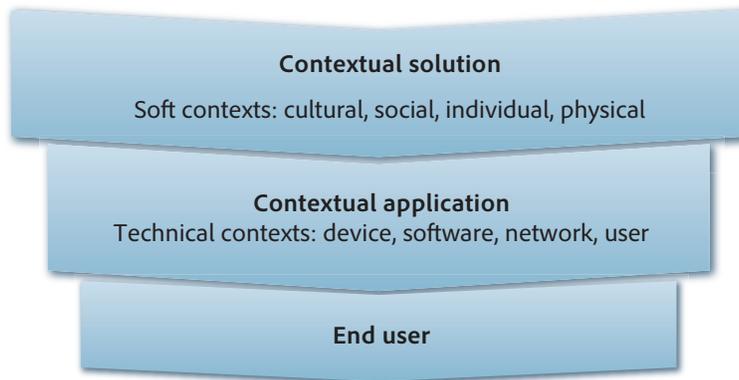
Adobe has been an integral part of this important shift in information access. As a critical partner in the evolving content development and publishing industry, Adobe understands how content can best be developed for consumption in a wide variety of channels and devices. For instance, as the de facto standard for creating and delivering rich applications, content, and video on the web, the Adobe® Flash® Platform is an integrated set of technologies that enable content distribution across multiple channels. Adobe Flash Player software resides on 98% of Internet-connected computers and more than one billion devices and delivers over 80% of web videos worldwide, helping to ensure that content and applications are presented consistently in the format users want.

With its platforms and products that are inherently multichannel and multidevice, Adobe envisions a new class of "contextual solutions" taking hold in the marketplace. These solutions are broader in scope than a device, a campaign, or a single service; rather, they encapsulate the various contexts in which the end user exists, interacts, thinks, consumes, and purchases. And when content owners understand the different types of users and how they differ in their contexts, they are in a much better position to design experiences that are compelling and sticky. At the heart of every contextual solution is at least one or more contextual applications—an emerging type of application that spans multiple devices and uses system, user, and network contexts to provide an optimized user experience and deliver improved business results.

This white paper provides an overview of the types of contexts that compose a contextual solution and application. With examples given along the way, it culminates with a framework for considering all appropriate contexts while designing and developing a new contextual solution or an application that is part of an existing solution.

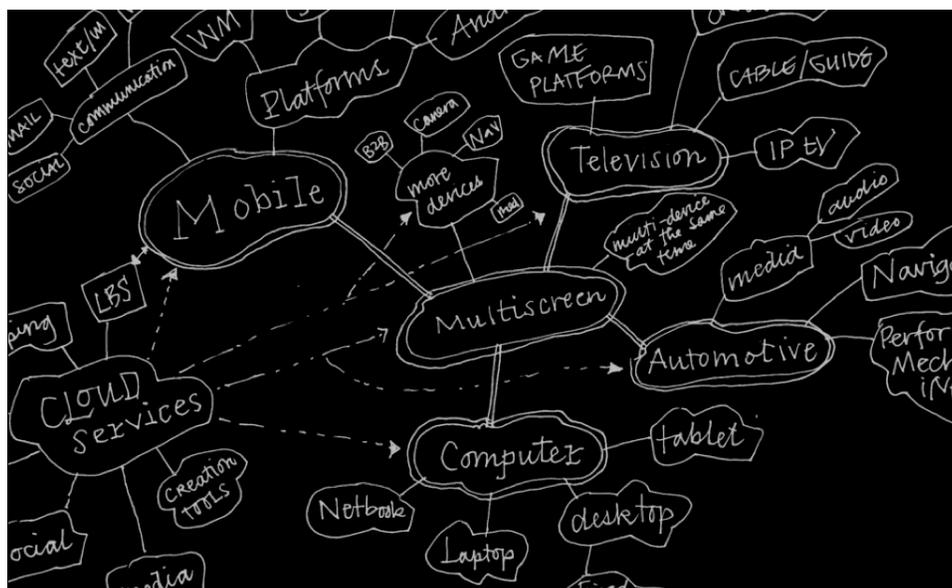
Design guidelines

User experience design remains a nascent and evolving area for the software industry. For the most part, the industry prefers to leverage established design trends to develop new applications. These trends, established with every new wave of innovation, govern how information gets collected, published, and accessed. For example, with the rise of the Internet, new usage patterns were created based on how information was disseminated among millions of people with the click of a button. We now find ourselves at the beginning of yet another shift in information access, thanks to the enormous growth in the number of devices and networks to which users now have easy access. At Adobe, we believe that this shift provides fresh opportunities to study new contexts in which users interact with software. It is critical at this juncture to study not only "technical" contexts—such as devices, networks, and APIs— but also cultural, social, intrinsic, and individual contexts that influence end-user behavior. These "soft" contexts form the critical building blocks of contextual solutions. A contextual application, in turn, combines the software and devices of a wider contextual solution. By studying and designing for the contextual solution, software designers and developers can build contextual applications that are an extension of the user's everyday life rather than yet another software tool that they try and quickly grow tired of.



The contextual opportunity

With an increase in ubiquitous computing, the software industry has attracted and converted more users, opening the door to services and applications that are personalized and contextually aware. The plethora of new channels, targets, devices, and media has given rise to an increasingly complex system fueled by the convergence of all forms of media. In this situation, churning out minimally improved competitive adjustments results in only incremental shifts in overall innovation.

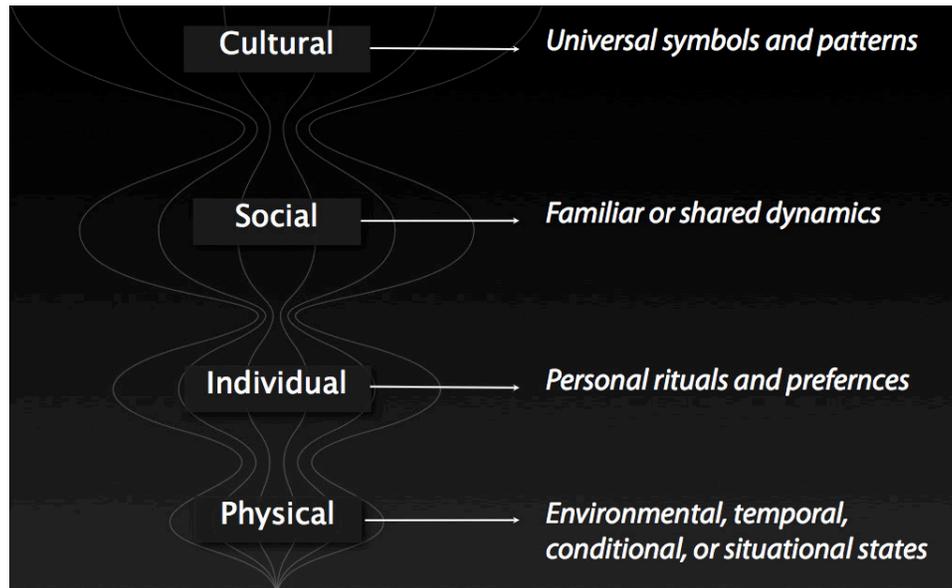


Traditionally, when developing for the web or for mobile, software decision makers and product development teams have asked the following questions in the following order:

- What is the competition doing?
- What can we do better?
- How fast can we get to market before the playing field shifts again?
- What can we do to provide greater value to customers right now that would make them switch?
- What can we use to reach our existing customers and, more important, attract new ones?
- What technologies and tools can we leverage?

While this approach has proven to be powerful, especially for rapid development and “get-to-market-now” plans, when designing for an experience that is intended to add value and serve an individual’s needs on a more intrinsic level, designers and developers need to shift their thinking beyond the context of one device or screen to a contextual solution.

Soft contexts



Cultural: Universal symbols and patterns

Thinking about a user’s context requires an insight into the individual as well as an understanding of universal expectations. For example, the symbol of e-mail as a flying envelope was identified as a universal icon. Apple® uses a postage stamp—same concept model, different visual.

Thinking about this level of experience can be useful when trying to finesse and hone the message, interaction, or engagement, especially for users from different backgrounds. But it’s even more critical to consider when developing a solution with several modes of interaction, such as web mail accessed on a desktop, mobile device, or TV or a solution accessed only on a desktop, but by thousands of users from all over the world.

Social: Familiar or shared dynamics

This context covers the mutually shared activities or interests of groups or teams of which the user is a part or has an interest in being a part. With this context, it is critical to know not only what networks and groups the user is a part of but also how shared information in that network can bring more value to the user experience at every point that users interact with the solution.

For example, the Internet has popularized the concept of user ratings with which users express, at no cost to the publisher, their views about products or services and make that information available for others to consume, possibly influencing their decisions. An extension of this concept would be to present users making a purchase decision with relevant ratings and user comments from groups and networks with which they associate. Additional enhancements to the experience could be made by factoring in services available in the user’s physical context—such as location data and a camera on the user’s device—that can help manage the information even further.

Individual: Personal rituals and preferences

Individual context is about an individual's sense of self and personal space. Understanding their operating world view, social context, and personal rituals provides deeper insight into user needs in any possible situation. Learning their patterns, tendencies, and behaviors is important to be reasonably sure that when new devices, experiences, and means of input are presented to them, they will adapt readily.

Physical: Environmental, conditional, or situational states

Physical context, in some ways, is the easiest to understand. Start by asking a simple question: How does information about where users are located change the way they relate to the experience? This question leads to a consideration of the interfaces that users may have at their disposal at that time, whether a billboard, the dashboard of an automobile, a desktop, a mobile device, or a TV. In all these cases, an opportunity exists to connect with the user in meaningful ways as long as the user's preferences and condition are factored in.

For example, consider the activity of reading *The New York Times*, which can now be done at the breakfast table, at work, on the way to work, or remotely later in the day through a desktop-based application.

Traditionally, the paper has been published and printed in morning and afternoon editions; now it is freshly served all the time and accessible everywhere. By thinking from the start about their online and offline news reader on both desktop and mobile, the newspaper has created an exceptionally user-centric, context-aware experience.

Technical contexts

In a contextual solution, a majority of media touch points between the user and the experience are a set of physical devices, each with its own unique capabilities. A contextual application is a subset of the solution that accounts for the devices along with the system, user, and network context to provide an optimized user experience and deliver improved business results. While designing a contextual application, it is important to keep the following types of technical contexts in perspective.

Network: Knowledge in the cloud

The network context refers to a broader definition of what the network can offer than simply a connection to the Internet or a local network of devices. Increasingly, applications are being built in such a way that they are dependant on a network of services and platforms, for example, the Facebook® Platform. As the industry pushes more processing and services into the cloud, data from services in different networks is being mashed up in real time to create the user interfaces that are becoming familiar on a day-to-day basis. Hence, in designing a contextual application, it is critical to bear in mind the relevant networks and their "network effects" on your user experience. It is also important to understand and anticipate data privacy boundaries as sensitive user data moves from one network to another.

User: Learning from current interactions and past actions

The user context is defined by user preferences, usage history, social connections, and the devices used to access the application. Contextual applications should be designed with the intent that every action from users is an opportunity to learn something more about how they would like to engage. Different users interact with applications in different ways, and the more personalized the application experience, the higher the likelihood that users will stay with the application and be willing to access it from multiple points of engagement. For example, Pandora radio is a popular, personalized Internet radio experience that remembers user preferences and customized stations no matter what device is used to get access to the service. Pandora takes it even a step further by learning the kind of user—free versus paid and desktop versus mobile—to serve the appropriate advertising.

Applications can learn more about users not just from data they provide but also from the networks in which they participate, devices they use (if the user is predominately home bound or mobile, for example), people with whom they communicate the most, and brands and trends with which they affiliate most (become "fans" of, for example). By providing users with different access methods and experiences to suit their personal patterns of use or interests, contextual applications increase the value they provide and, by that same token, extract from their users.

Device: A unique yet consistent experience for every device

New devices and access mechanisms are sprouting every day, and contextual applications should be designed to deliver a consistent yet unique experience to the end user regardless of device. Designing for the device context includes understanding the variation in display sizes and resolution, network features, and input mechanisms.

For every device you want to target, it is important to understand input mechanisms such as multi-touch, keypads, and how the presence or lack of them (say, on a TV) influences the features of your application. In addition, the software capabilities of the device must be known. For example, note how much local storage is available to the application for a session and for its lifetime on the device. This knowledge can influence how you think about storing user preferences and how you design for the network context. Plus, knowing which software development platforms are supported on the device helps determine how assets, skills, and code can be reused when you begin development for another target device.

While it is important to create experiences that target the obvious device types—mobile, desktop, TV—it can also be valuable to consider the physical soft context of the user to understand other devices that may add value to the overall contextual solution. One example is the Nike+® solution, which uses a small device embedded in a running shoe to record the user’s running routines and uploads that data to a desktop-based logging system. Once the data is in the system, it can be analyzed, shared with friends on social networks, and accessed on multiple devices (with screens). However, note that the running shoes followed by the recording device are the starting points in the user’s physical context.

Software: Use cases, prototyping, and platforms

Planning for the software context includes considering how users access the application on a device—through a browser or an installed application—and which software tools are available to quickly prototype and test on all target devices.

Since design for multiple devices and form factors is inherent in contextual applications, choose tools that allow quick prototyping so you can test your designs and ideas in the field with different users in different physical contexts and quickly iterate features and experience.

When considering multiple devices, monitor the devices from which users access or are most likely to access your service and choose complementary software platform(s). Contextual applications also tap into a variety of networks and services, and hence it is critical to choose a platform that from the get-go is open to existing APIs and other forms of data interchange. Finally, the platform with the most reach, openness, and extensibility will provide more reusability during development and lower barriers to consumer adoption.

Start designing

This paper has walked you through the building blocks (contexts) that compose contextual solutions and applications. Here is how the soft contexts of a solution map to the technical contexts of an application.

Contextual application	Contextual solution			
	Cultural	Social	Individual	Physical
User	•	•	•	
Device				•
Software				•
Network				•

When designing a new solution or an extension to an existing solution, we encourage you to use these contexts and the above mapping to define the scope of your design effort. With the advent of new devices, services, and networks, there are many options for current and future users. Thinking of design in terms of contexts in which users find themselves provides a broader canvas to map their changing behavior and to design better solutions that meet their unique needs.

As is shown by the framework below, gaining an understanding of these contexts does not end in the initial discovery phase of developing a new solution. Design, like development, should be iterative in bringing a new idea to fruition. We recommend applying the above context mapping to all major phases of development to continuously allow for a deeper understanding of these contexts so as to develop a solution that delivers high economic value and delights its users.

		Discover	Design/develop	Deliver
User	Individual/ social/ cultural	Gather insights	Create solutions	Inspire
		Get immersively involved in the space that you're designing	Transform insights into responsive, contextually aware solutions	Provide elevated value
		Observe patterns	Explore all obvious and uncharted territories	Engage consumers in new ways
Device, software, network	Physical	Imagine authentic, new delightful ways the solution can be optimized	Solve old problems in new ways	Inspire the community and industry
		Identify touchpoints	Liberate and optimize the intrinsic experience	Promote and share

Conclusion

It is rare that a business intentionally creates a service that aims for the functionality or complexity provided by a contextual application—one that easily works with and can be extended to new devices and network environments. The more common scenario is an application created by extending an existing service or solution to new domains, geographies, or additional devices. It also can involve adding value to an existing physical good (like Nike+).

In all instances, solutions that tap into the established ecosystem and interconnected system of devices, networks, and users can offer businesses unique and compelling value. A solution that adapts to a lifestyle—a consumer based in the home or on the road, one who uses a PC with a widescreen monitor or a handheld device—is bound to earn a user's loyalty. In essence, by keeping all types of context in perspective, you can design and develop solutions and applications that are more portable, personalized, aware, and thus more compelling. The key: Always start by imagining a system rather than just a device, that is continuously user connected and contextual.

For more information

Adobe Flash Platform:
www.adobe.com/flashplatform

Open Screen Project:
www.openscreenproject.org

Building contextual applications:
www.adobe.com/devnet/flashplatform/context_apps



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