



# SAP Fiori Design Overview

Deepak Kumar

Email: [Deepak3830@gmail.com](mailto:Deepak3830@gmail.com)

## Abstract

SAP Fiori is a design language that aims to improve user experiences, for business applications built on SAP User Experience. Launched in 2013 SAP Fiori transforms how users engage with SAP software by focusing on simplicity, efficiency, and user design principles. It includes a range of apps for business tasks such as approving work requests handling transactions running calculations and managing self-service activities. The main objective of SAP Fiori is to provide a seamless user experience across devices like computers, tablets, and smartphones. Integrated into the SAPUI5 front-end library this framework offers more than 170 UI controls and multiple layout options to ensure consistency in design, control behavior, and visual appearance. While the framework itself doesn't guarantee a user experience, adherence to the SAP Fiori guidelines is crucial for achieving this goal. These guidelines focus on creating layouts that are user-friendly and easy to maintain while maintaining a look through consistent interaction patterns. They promote a user-centered approach that helps UX designers and developers align their designs, with SAP UI5 controls. By leveraging built components (SAP UI5 components) application development can be accelerated significantly. The SAP Fiori design brings a range of benefits, like themes, smart home pages, and an interactive chat experience all aimed at improving how users interact with the system. Moreover, SAP Fiori makes use of up-to-date web technologies such, as HTML5, CSS3, and JavaScript to guarantee speedy performance. It also works seamlessly with SAP S/4HANA, the ERP suite making business operations more straightforward and facilitating decision-making in real-time.

**Keywords**— SAP FIORI, UI5, SAP Design, HTML, CSS, Javascript

## Introduction

**UI5** - SAP UI5, also known as SAP User Interface, for HTML5, serves as a JavaScript framework for building user-friendly web applications. It plays a role in shaping the SAP Fiori UX by offering the components and resources needed to develop business applications that seamlessly adapt to various devices such as desktops, tablets, and smartphones.

**HTML** - HTML, short for HyperText Markup Language stands as the universal language utilized for crafting and structuring documents across the internet. It lays down the framework of web pages by defining elements like headings, paragraphs, links, images, and multimedia content.

**CSS** - CSS (Cascading Style Sheets) functions as a styling language that dictates how a document written in HTML or XML should be presented visually. CSS determines the appearance of HTML elements on screens, paper formats and other display media.

**JavaScript** - JavaScript emerges as a programming language that excels in creating features and improving user engagement on websites. As one of the core technologies underpinning the World Wide Web landscape with HTML

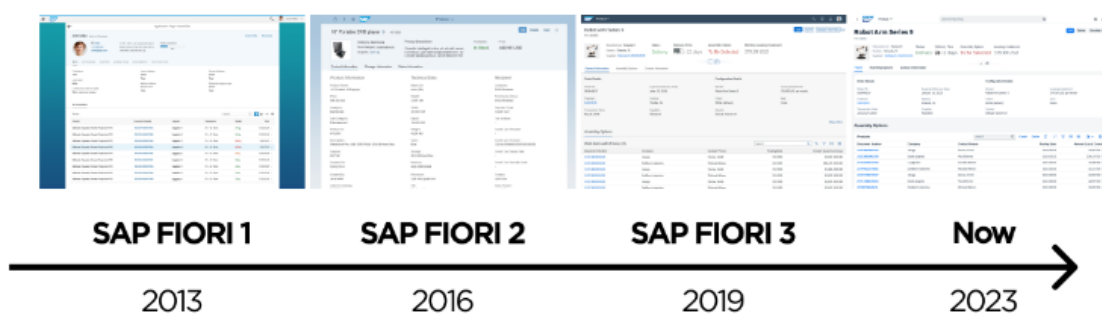
and CSS JavaScript plays a role, in enhancing online experiences.

## Evolution of SAP Fiori Design

**SAP Fiori 1.0** - The introduction of SAP Fiori 1.0 signaled a shift towards prioritizing mobile design establishing core principles centered on developing user-intuitive, adaptable, consistent, and enjoyable applications. This initial release facilitated the adoption of design across devices and incorporated interactive elements inspired by mobile platforms. It marked a departure from all-in-one applications to role-based apps fundamentally altering the landscape of enterprise software design and user experience.

**SAP Fiori 2.0** also known as the Belize theme has advanced to provide solutions, for business situations by introducing conversational interactions and machine intelligence via SAP CoPilot. It has incorporated floor plans and design elements, such as integrated analytics, notifications, search capabilities, and navigation features to establish an environment for productivity. This updated version embraces a design approach tailored to roles and tasks in both enterprise and mobile settings. SAP Fiori 2.0 gained recognition for its innovation. It was honored with the Red Dot Award before its launch in October 2016.

## How SAP Fiori evolved



**SAP Fiori 3** (Quartz theme) introduced a redesigned topmost screen area, known as the shell bar, to support all navigation and functional requirements across different products and allowed for switching between independent products. The home page was redesigned to offer more flexibility in the details provided, and the concept of multiple home pages using spaces was implemented. Overview pages were integrated into the lifecycle of the home pages. Support for third-party technologies like Angular, React, or Vue was included, aligning with the Fiori 3 design system. This version made a significant step towards a human-centric approach by integrating machine intelligence.

**SAP Fiori with Horizon** introduced four Horizon-based themes: Morning Horizon (light), Evening Horizon (dark), High Contrast White, and High Contrast Black. It launched the Horizon Icon Font and typography, designed with accessibility in mind, following W3C Web Content Accessibility Guidelines (WCAG 2.2). The design is perceivable with a vibrant color palette meeting WCAG AA standards, alternative texts for images, resizable text, and sufficient contrast between text and background colors. Fiori apps are operable through keyboard navigation and other assistive technologies. The use of clear and simple language, instructions for using the application, and design consistency ensure understandability. Sturdy applications are designed to function with both present and upcoming user tools like technologies by applying HTML, CSS, and JavaScript methods. The Horizon design also provides choices, for customer brandings, such as themes, logos, adaptable tiles personalized Launchpad layouts, brand representation, in-app interfaces, localization options, language customization features, and personalization choices.

### Critical Aspects to Address During the Design Phase

During the design phase of the application, the developer or designer identifies which application needs to be created and who the intended user is. After addressing these questions, the following elements must be translated into the design: device-specific capabilities or modifications, considering web apps run on both desktop and mobile devices; utilization of device native features such as the camera and microphone; integration of conversational bots to enhance user experience;

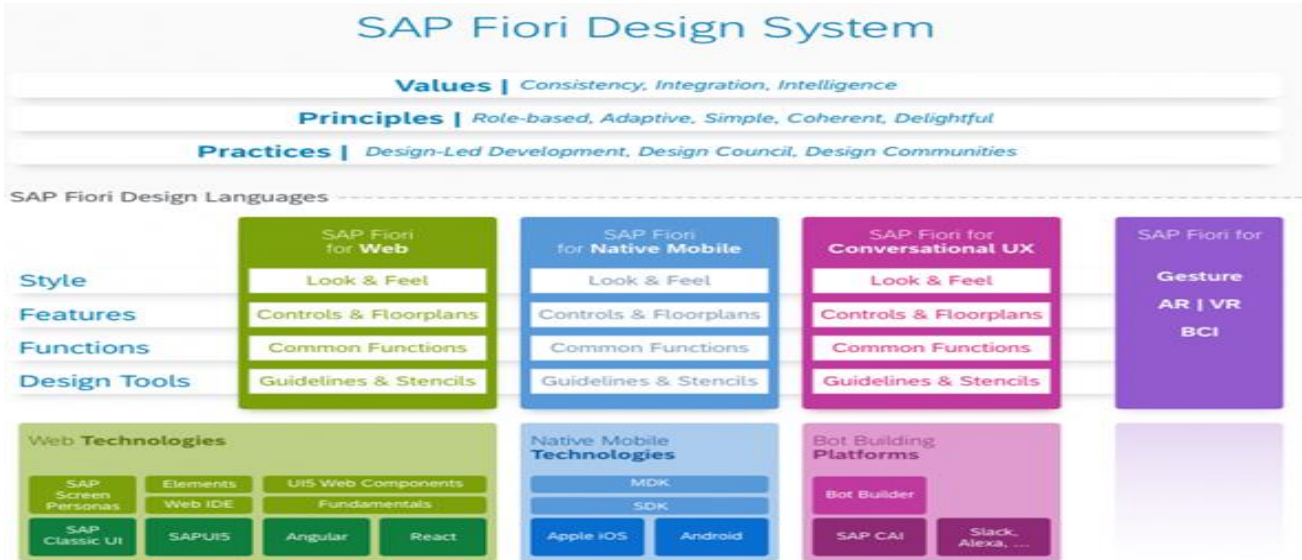
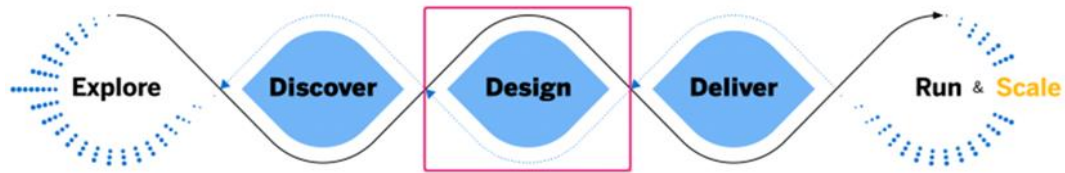
launchpad as a single entry point offering role-based apps; ensuring the design principles are role-based, adaptive, simple, coherent, and delightful; modular components for layout, floorplans, and UI elements to build a consistent information architecture; page structure utilizing the entire view of the application, typically divided into three areas—header, content, and footer; traditional layouts, or floorplans, used in specific use cases such as list reports; and basic UI elements like the navigation bar, input fields, buttons, and more. These considerations ensure a well-rounded and user-centered design approach for the application.

### SAP Fiori – design system

The SAP Fiori design system ensures user experience on platforms and devices. It provides user-scalable solutions suitable for enterprises. Its functionalities enable software design and development to shift from apps to a modular design method that aligns with business roles while emphasizing user tasks and workflows. Design system components include values, principles, practices, and the SAP Fiori design language.

Fundamentals of **values** include consistency, ensuring design solutions can be adopted across all UI technologies; integration, facilitating the easy incorporation of independent products, technologies, and ease of use; and intelligence, incorporating machine learning and AI as integral parts of the user experience.

Fundamentals of **principles** include being role-based, providing the right information at the right time, and designing based on business needs and how users work, tailoring the business experience to the specific context. They are also adaptive, ensuring usability across any device of the user's choice and providing relevant insights. Simplicity is key, focusing on ease of use and important tasks to allow users to complete their jobs intuitively and quickly. Coherence ensures a consistent experience across various situations and job roles, such as managers and employees having the same user experience with applications. Lastly, the principle of being delightful aims to enrich the user experience, making it easy and enjoyable to perform tasks.



Fundamentals of **practices** include design-led development, where user experience is at the center of the development process. This approach ensures that the design is intuitive, user-friendly, and meets the needs of the end-users effectively. By prioritizing user experience, the design-led development practice aims to create solutions that are not only functional but also engaging and satisfying to use.

The SAP Fiori **design language** supports multiple technology platforms, including web, native mobile, and conversational UX. Its fundamental design approach is standardized across these platforms to ensure consistency. Key reference technologies include browser-based SAP UI5 applications and the SAP Cloud Platform software development kit (SDK) for developing native iOS and Android apps. This standardization and multi-platform support ensure a cohesive and seamless user experience across different devices and interfaces.

### Design-led development process

The design-led development process leverages design

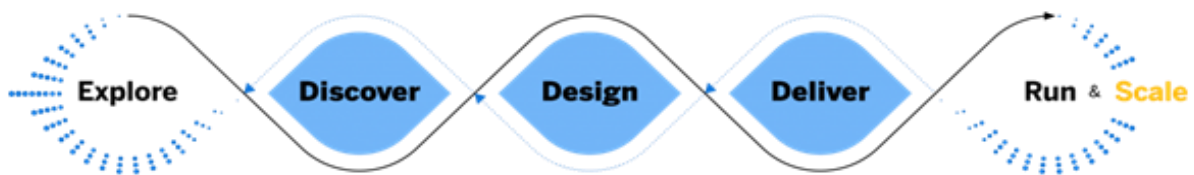
innovative solutions that prioritize the user. Each phase of the process involves the following steps:

**Explore:** Identify business challenges and innovation opportunities in collaboration with your customers and end users.

**Discover:** Understand what the customer wants and needs. Identify the tasks and challenges faced by end users. Asking these questions provides a holistic view of the business roles impacted by your application and helps identify what needs to be developed.

**Design:** Brainstorm with a multidisciplinary team to create an initial prototype, then validate it with the customer. Applying design guidelines ensures consistency in user experience.

**Deliver:** During development, incorporate changes based on customer feedback and recheck the product against guidelines to ensure quality.



thinking methods to ensure an optimal user experience. Building software is more than just coding; it's about creating

**Run and Scale:** Assess how end users interact with the application. Determine if it makes their work easier, if they enjoy using it if they can find the information they need, and

if any functionality is missing. The goal is to develop an application that provides a delightful user experience.

## Accessibility in SAP Fiori

Accessibility in SAP Fiori ensures that everyone, including people with disabilities, can access and use information and communication technology. This is achieved through two levels: the framework level and the app level.

**Framework Level:** Features are built into the core design of elements upfront and are available to app teams out of the box.

it. Consistent shapes and appearances for controls such as Message Box and Message Toast aid in this process. Additionally, meaningful labels, tooltips, and placeholders guide users effectively and ensure relevance.

**Accessibility recommendations:** Avoid changing the HTML structure. Ensure focus persistence: if the parent control cannot take focus, it should shift to a nearby control. Set the initial focus position on the element most likely to be edited. Do not interfere with existing accessibility features. Assign a unique ID to each component. Provide tooltips for container controls. Refrain from defining custom colors, font families, or fixed heights/widths, except for specific cases



**Visualization: Minimum Contrast:** Adheres to the Web Content Accessibility Guidelines (WCAG) 2.2. The default theme meets the minimum color contrast requirements, and the high contrast theme offers a 7:1 ratio for texts. **Consistency of Icons:** A library of icons with use case descriptions ensures visual consistency. **Keyboard Focus Visualization Design:** Utilizes a contrast ratio that highlights the current focus in all themes. **Layout Adaptations:** Responsive layouts enable applications to function across various devices. **Support for Text Resizing:** Users can adjust font sizes using the browser zoom.

**Keyboard Support:** Controls are designed to be keyboard-enabled across all standard UI elements and controls. **Messaging Patterns:** Incorporates busy indicators, errors, and notifications. **Screen Reader Enablement:** Provides speech or braille output for end users.

Messaging patterns include busy indicators, errors, and notifications to keep users informed of the application's status. Screen reader enablement provides speech output or braille output to assist end users, ensuring accessibility for those with visual impairments.

**App Level:** Some accessibility features need to be added or adapted to reflect the app-specific context. Proper indications for status messages and error handling ensure that users can easily identify where an error has occurred and how to rectify

like images or writing modes (left-to-right or right-to-left). Use predefined CSS parameters. Prefer REM/EM units over PX. Implement flexible layout concepts. Use media queries when flexible layouts do not meet UX expectations.

## Importance of Responsiveness and Adaptability in Multi-device support

It's important to have adaptable designs, for our apps so that users can have a smooth experience on various devices. Responsive design ensures that our apps adjust well to screen sizes and orientations optimizing how content is displayed. This flexibility lets users seamlessly switch between desktop and mobile devices while keeping performance and the overall look cohesive. Adaptive design goes a step further by customizing the interface and interactions based on device capabilities and contexts making usability and engagement better. By focusing on adaptive design principles we can deliver an enjoyable experience, for all users regardless of the device they're using.

Adopting a "mobile-first" approach involves prioritizing core functionalities and enhancing them for larger devices. Instead of using desktop-specific controls like sap.ui.commons, opt for responsive controls that adapt well across all screen sizes. For Analytical, Tree, and Grid tables, configure alternate UIs specifically tailored for smartphones to ensure usability. Make controls touch-friendly and responsive, adjusting app sizes and layouts based on the device type. Simplify complex

desktop features for mobile users by either hiding or disabling them when necessary. It's crucial to maintain consistent performance and interface across desktops, tablets, and smartphones to provide a seamless user experience across all devices.

**Responsive design** When creating applications, in SAP Fiori with design the focus is on ensuring consistency across devices without the need for extensive coding. The framework SAPUI5 simplifies this process by providing UI controls that adjust smoothly to screen sizes and user interactions. For example if you were to build a sales dashboard in SAP Fiori using SAPUI5 elements like charts and tables within the dashboard would automatically adapt and rearrange themselves according to the device being used—be it a desktop, tablet or smartphone. This adaptable approach guarantees that users will have an optimized viewing experience tailored specifically to their device removing the requirement for development efforts, for each device type.

**Adaptive design** When it comes to SAP Fiori adaptive design focuses on customizing user interfaces based on the capabilities and usage scenarios of devices. Unlike design that adjusts layouts, for all devices automatically adaptive design involves creating designs tailored to different types of devices. This method allows for improving data input tasks on desktops while simplifying interactions on tablets and

maintaining consistent element spacing. Margin classes manage spacing outside elements, whereas padding classes control spacing within elements. By leveraging these standardized classes, developers enhance design consistency and usability across SAP Fiori applications, without the need for manual adjustments.

### Design Consistency and Enhancing User Experience: Appearance, Sentiment, and Text

Maintaining uniformity in appearance, user experience, and language is essential for building a robust brand identity. Following SAP's detailed guidelines promotes recognition and improves user interaction across various platforms and technologies. Key areas of focus include Design Tokens, Theming, Color schemes, Icon design, Motion design, Typography, UX Illustrations, UI Texts, and In-App Help features.

Using SAP Design Tokens to Ensure Design Consistency: In the dynamic field of software design, consistency plays a crucial role. SAP acknowledges this principle by robustly implementing design tokens—a cornerstone for maintaining alignment and coherence across its extensive array of technologies and platforms. Fundamental design elements such as color schemes, typography styles, shadows, and measurements are encapsulated within SAP design tokens. Unlike traditional hard-coded values, design tokens utilize



smartphones. By designing for each device adaptive design enhances usability, by addressing the capabilities and user needs of each device. This personalized approach ensures that users enjoy an intuitive experience designed specifically for their device enhancing efficiency and usability across device sizes.

The **responsive spacing** system in SAP Fiori utilizes predefined CSS classes for padding and margin to maintain consistent spacing between elements across various device sizes. These classes, including `sapUiTinyMargin`, `sapUiSmallMargin`, `sapUiMediumMargin`, `sapUiLargeMargin`, `sapUiTinyPadding`, `sapUiSmallPadding`, `sapUiMediumPadding`, and `sapUiLargePadding`, automatically adjust based on screen space availability. `sapUiTinyMargin` and `sapUiTinyPadding` provide minimal spacing, while `sapUiSmallMargin` and `sapUiSmallPadding` offer compact layouts. `sapUiMediumMargin` and `sapUiMediumPadding` provide standard spacing, and `sapUiLargeMargin` and `sapUiLargePadding` offer more generous spacing for emphasis or separation. These classes ensure optimal spacing on desktops, tablets, and smartphones, contributing to a cohesive user interface by

descriptive names that simplify their application to UI elements. This approach enables rapid scalability and adaptability across diverse SAP products and interfaces, while also enhancing clarity and ease of maintenance. Tokens seamlessly integrate with all SAP technologies and correspond 1:1 with theming variables available in various formats within SAP's theming infrastructure.

In SAP's design framework tokens are grouped into three categories to uphold consistency and customization options across its system. Reference Tokens, like "primaryColor," "secondaryColor," and "backgroundColor" define colors for each theme serving as references rather than direct user interface elements. Main/Base Tokens such as "sapBrandColor" and "sapTextColor" establish elements that interact with other component tokens shaping the overall design language and theme. Component Tokens like "sapButton\_Background" or "sapButton\_BorderCornerRadius" provide styles for individual user interface components ensuring customization and coherence across SAP's design elements. This structured approach allows SAP to effectively manage themes ensuring consistency in its design framework, for a user experience.

The common naming convention for tokens within SAP's design system follows a structured approach to ensure clarity and consistency across various components and states. Here's a breakdown of the convention with examples:

- **Company Name:** Starts with "sap" in lowercase.
- **Component or Semantic Usage:** Directly identifies the component or semantic usage, such as "button," "text," "input," etc.
- **Additional Styles or Semantics:** Separated by underscores to specify styles or variations, like "Emphasized," "Primary," "Secondary," "Link," etc.
- **Component States or Additional Identifiers:** Positioned to indicate states or specific conditions like "Hover," "Disabled," "Active," "Focus."
- **Usage:** Specifies what the token is used for, such as "Background," "BorderColor," etc.



Examples:

- `sapButton_Primary_Background`: Background color for the primary button.
- `sapText_Secondary_Emphasized_TextColor`: Text color for emphasized secondary text.
- `sapInput_Disabled_BorderColor`: Border color for a disabled input field.
- `sapLink_Hover_TextColor`: Text color when the link is hovered.

**Theming** options, in SAP applications, provide a range of choices for customizing the appearance and user experience based on preferences. The newest theme, Morning Horizon presents a design. Includes other alternatives like Quartz Light, Quartz Dark, High Contrast Black (HCB) High Contrast White (HCW), and the Evening Horizon dark theme. By allowing custom theming customers can personalize the default SAP Fiori theme to match their strategies. This customization can be as simple as changing brand and base colors or more complex by adjusting UI control colors. Some companies develop themes to suit sub-brands within their business units ensuring a cohesive look, across their diverse product offerings.

**Quick theming** facilitates rapid adjustments to logo and UI colors through the UI theme designer, leveraging a predefined color palette that ensures a cohesive look and feel across different UI elements. Primary and secondary branding colors play a pivotal role in maintaining brand consistency, easily incorporated into the custom palette of the

UI theme designer. Detailed theming goes beyond color adjustments, linking specific UI controls and components directly to primary brand colors and other theming variables. This approach ensures that elements like buttons, icons, and interface states reflect the desired branding aesthetic effectively. It involves meticulous control over how colors are applied, enhancing the overall visual coherence and brand alignment of SAP Fiori applications.

To personalize themes in SAP Fiori using the Designer tool start by opening the Theme Designer, within the SAP Fiori Launchpad administration interface. You can. Create a theme from scratch or modify an existing one. Utilize the Theme Designer interface to make adjustments to elements like colors, fonts and icons which are organized for management. Preview the theme in time to ensure it is user maintains consistency across different Fiori applications. Once you are

happy with the changes export the theme package from the Designer. Implement it in your SAP Fiori environment. All SAP themes follow WCAG 2.2 guidelines, for accessibility.

Regarding colors, SAP's themes are designed with vibrant combinations aligned with the SAP brand identity, ensuring a cohesive visual experience across applications. Primary colors define the overall application appearance, while secondary colors accentuate key components without direct use in control stylings. Grayscale tones maintain simplicity and are used for borders or background sections, with darker tones for text. Semantic value state colors denote different status levels.

**Iconography** SAP themes have updated their icons to be more clear and modern ensuring that they are consistent, in size and style throughout applications. The icons feature symbols to make user interactions easier. Can be resized without losing quality since they are in vector format. SAP provides the icons in a format, for easier management and updates allowing users to personalize them as required.

## Conclusion

In summary, SAP Fiori is a developed design system that has undergone growth to prioritize user-friendly principles and accessibility. The design-driven development approach guarantees that SAP Fiori apps are not just visually appealing but functionally strong, on devices. By embracing design concepts SAP Fiori smoothly adjusts to screen sizes and orientations enhancing ease of use and user satisfaction. Consistent design elements and themes maintain brand

identity. Enhance the user experience by ensuring coherence and clarity. Accessibility remains a focus ensuring that SAP Fiori apps are inclusive and adhere to WCAG guidelines. As SAP Fiori evolves further its dedication to design and innovation centered on users continues to drive its success, in enterprise app design.

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