User Experience Consistency Testing

Potential of Test Automation

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User Experience matters.

It should be tested.
Agenda

Introduction of User Experience Consistency (UXC)
- Motivation
- Reasons for inconsistencies

UXC Requirements at SAP
- Design-led development process
- Overview about the different requirements
- Potential of Test Automation

UXC Test Automation Approach at SAP
- Use Cases
- Demo of the tool
Introduction of User Experience Consistency
Motivation

Consistency in the interface allows people to transfer their knowledge and skills from one app to another.

A consistent app implements familiar standards and paradigms by using system-provided interface elements, well-known icons, standard text styles, and uniform terminology. The app incorporates features and behaviors in ways people expect.

— Apple, Design Principles

[…] consistency in computer systems constitutes a promise to the user. And it is not polite to break a promise.

— Jacob Nielsen, Coordinating User Interfaces for Consistency, 1989
Reasons for Inconsistencies in User Interfaces

Insufficient prioritization in development process
- Focus more on functionality than user experience
- Insufficient testing

Changes of UI paradigms and technological foundation over the years
- Evolution of a large suite of applications over the years
- Combination of modern apps or screens with older apps

Application Merger
- Integration of products of acquired companies into a suite of applications
User Experience Consistency Requirements
Design-led Development Process for New Apps

- New applications must follow the [Fiori Design Guidelines](#)
- Strict governance via decision gates
  - Design Decision Gate 0: Check desirability, viability, personas, user stories
  - Design Decision Gate 1: Check mockups, end user validation results
  - Design Decision Gate 2: Check implementation before shipment to customers
User Experience Consistency Requirements

Positioning

- Mandatory product standard
- Are less comprehensive than the Fiori Design Guidelines. Absolute minimum that even legacy applications must comply with.
- Especially relevant for application merger (suite of applications)
- Covers the topics Colors, Theming Concept, Typography, Iconography, Action Placement, Terminology, Shell Bar and Settings
Test Automation for User Experience Consistency

Desirability
- Can help to detect UXC issues before they are shipped to the customers

Viability
- Increase customer satisfaction by helping to achieve better user experience
- Detect UXC issues earlier (cheaper to fix)

Feasibility
- UXC tests can be automated significantly
  - At design time: Check the coding, for instance whether deprecated UI controls are used
  - At run time: Test the structure and attributes of the elements of the DOM of the UIs (focus of this presentation)
- Cannot fully replace human testing
- UXC test tool shall rather be a companion for developers, testers and product owners
UXC Requirement: Colors

*The product shall apply the specified theme colors for the user interface and its elements, such as backgrounds, shell, controls, and charts.*

Test Automation Potential / Where the Machine Shines:
- Are colors used which are no specified theme colors? *(simple)*
- Differentiate between colors for texts, background colors and border colors *(simple)*

Complex Tests / Where the Human Shines:
- Are the colors used correctly according the semantics of the UI element?
- Are semantic positive, semantic negative and accented colors used correctly?
UXC Requirement: Theming

The visual design shall be implemented using a semantically-named parameter structure for colors and other properties related to the theme.

The product shall support SAP’ Fiori theme and a high contrast theme for visually impaired users.

Customers shall be enabled to create own themes using their brand colors.

Test Automation Potential / Where the Machine Shines:
- Are only theme variables used for colors? (simple, but only if the theme variables are accessible in the DOM)
- Are the theme variables used for appropriate UI elements? (simple, but only if the theme variables are accessible in the DOM)

Complex Tests / Where the Human Shines:
- Are the colors used correctly according the semantics of the UI element?
- Are semantic positive, semantic negative and accented colors used correctly?
UXC Requirement: Typography

The product shall use the SAP-specific font “72” as default. Alternative system fallback typeface shall be supported.

The product shall use the specified typographic scale, weights, and sizes.

Test Automation Potential / Where the Machine Shines:
- Are there texts in the UI which are displayed in fonts other than the SAP-specific font “72”? (simple)

Complex Tests / Where the Human Shines:
- Are the specified typographic scale, weights and sizes appropriate for the semantics of the UI element?
UXC Requirement: Iconography

The product shall use pre-defined icons for commonly used actions. All icons shall adhere to the same icon style including semantics, colors, fill/outline ratio, and grid system.

Test Automation Potential / Where the Machine Shines:
- Are only approved icon fonts used? (*simple, requires governance*)

Complex Tests / Where the Human Shines:
- Are icons used according to the intended business semantics?
UXC Requirement: Action Placement

Actions that affect the page should be placed either in a header or footer toolbar and shall be right aligned to the page and begin in reading order with a primary action, followed by, if required, secondary actions and negative path actions.

Test Automation Potential / Where the Machine Shines:
- Are actions placed in a header or footer bar? (simple)
- Are actions placed in a nav bar? If yes, this is an accessibility problem. (partially simple)
- Are negative path actions following primary or secondary actions? (simple)
- Are footer bar actions finalizing actions? (simple)

Complex Tests / Where the Human Shines:
- Differentiate between primary actions and secondary actions.
UXC Requirement: Terminology

The product shall use standard terminology for specified commonly used actions.

Test Automation Potential / Where the Machine Shines:
- Are there terms used for actions which are in the preferred terms white list? (*simple, requires governance*)
- Are there terms used for actions which are rejected terms black list? (*simple, requires governance*)

Complex Tests / Where the Human Shines:
- Are there reasons for exceptional approval for terms which are not part of the white list?
UXC Requirement: Shell Bar

The product shall provide a (version of the) common shell bar with the defined branding elements and actions including the product switch and navigation means.

Test Automation Potential / Where the Machine Shines:
- Are approved Shell Bar controls used? (*simple, but only if appropriate governance is there*)

Complex Tests / Where the Human Shines:
- Do title and other content fit to the business semantics of the application?
UXC Requirement: Settings

Settings shall be available from a specified place.

Test Automation Potential / Where the Machine Shines:
▪ Is a personalization menu available in the Shell Bar? (simple)

Complex Tests / Where the Human Shines:
▪ Does the content stored in the user profile have the semantics of settings? Is it complete?
UXC Test Automation Approach at SAP
Use Cases

Exploratory testing with browser extension
- Navigate with the browser to the screens that shall be tested and run a report in the UXC browser extension

Fully automated testing in continuous delivery pipeline
- Test suites describe a navigation path through the application
- After each navigation, a UXC test is executed
- Existing test suites for functional UI tests can be reused

UXC testing across the development life cycle
- Tool supports UXC tests at Design Decision Gates
- Helps developers, testers and product owners to detect UXC issues earlier
- Support product validation activities by central quality organization
Demo: Exploratory UXC Testing with Browser Extension
Summary

- User Experience Consistency is an important software quality criterion.
- User Experience Consistency testing can be automated significantly.
- Development guidelines and common infrastructure facilitate the development of software with a good user experience and can be used as testing criteria as well.
- Automated User Experience Consistency testing can be applied across the complete development life cycle.
Thank you.

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