









UI Elements

UI Elements - Agenda

UI Activities Properties

-  Common & Specific
-  Target group
-  Containers

Input methods

-  Hardware Events (default)
-  Simulate Click/type (API)
-  Windows Messages

Screen Scraping

-  Full Text
-  Native
-  OCR

Web Scraping

Best Practices

Q&A

Test

Online Resources

UI Activities Properties

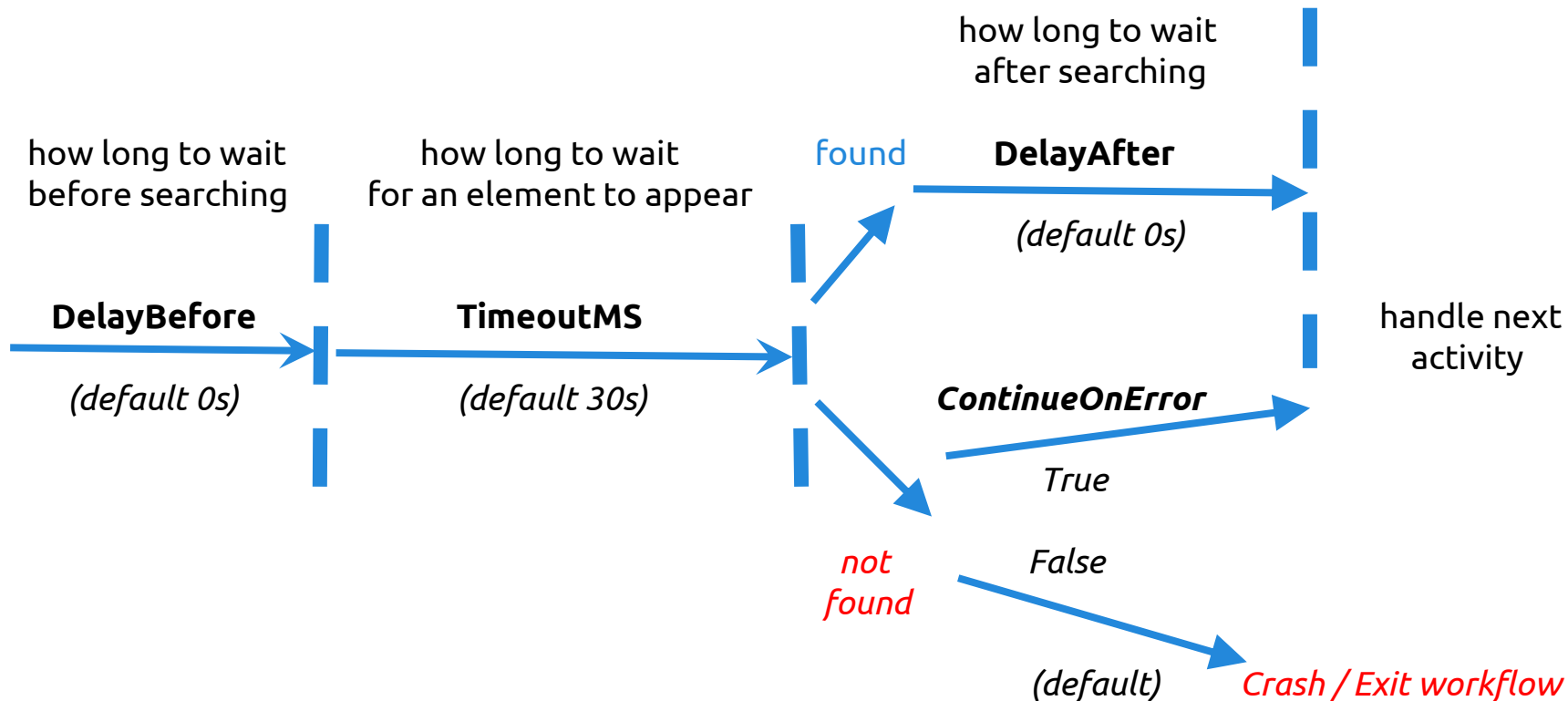
Common Properties

- **ContinueOnError** - continues even if it doesn't find the element
- **Delay After** – adds a pause after the action (in Milliseconds)
- **Delay Before** - adds a pause before the action is executed (in Milliseconds)
- **TimeoutMS** (in Milliseconds) – how much does it wait to find the element before throwing an error
- **WaitForReady** – wait for the whole page to load or not
- **Target** – identifies the element we are running the activity on

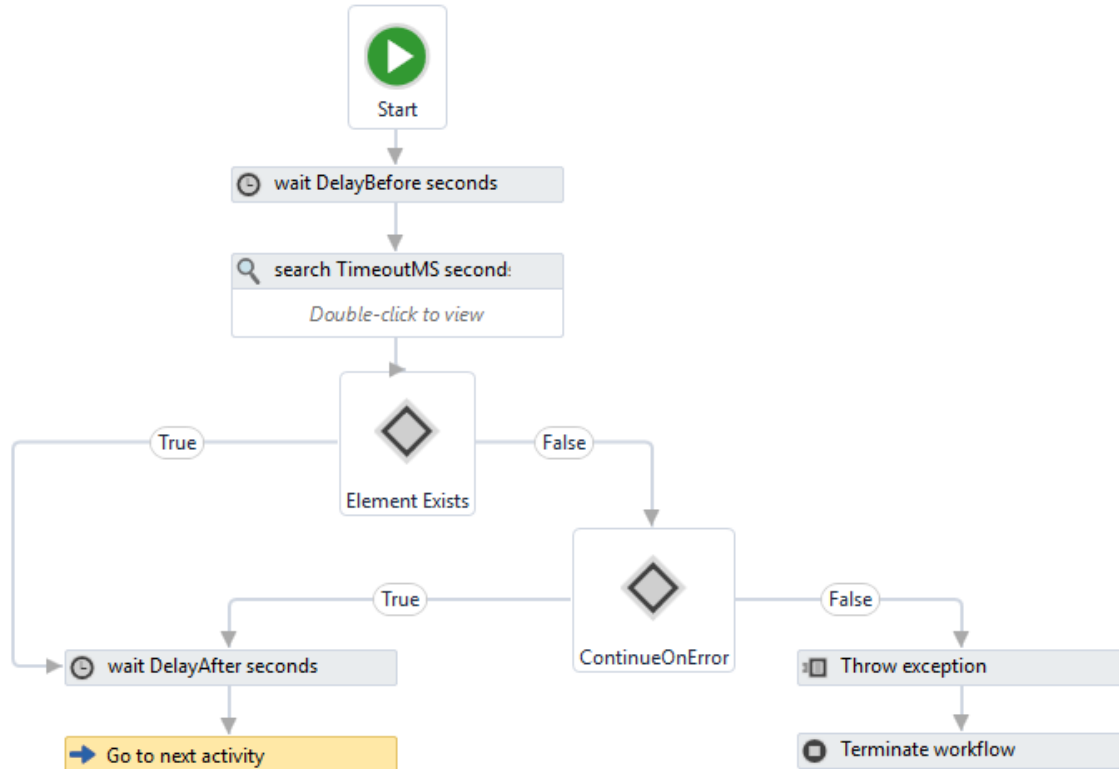
Specific

- dependent on the specific role of an UI element

Ui Activities Timeline



Ui Activities Timeline



What is the target?

Context

(given by a container)

+

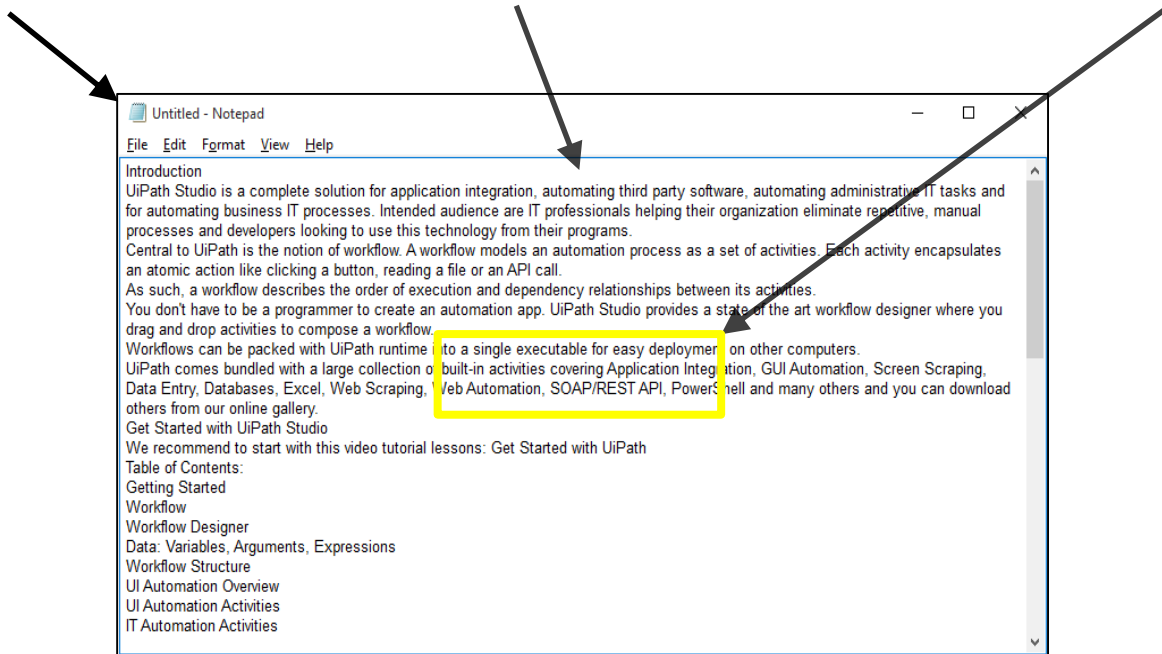
Selector

(or Element reference)

+

Clipping region

(press F3 in selection tool)



Containers

What?

They add a **context** (window) to the UI activities contained

Which?

Attach Window / Open Window

Attach Browser / Open Browser (can be private or hidden)

Active Window

When?

When performing more actions on the same window (area)

When having multiple identical windows

Exercise 1: show target selection

Have a notepad application open with a document full of text

1. Highlight on the editing area using no clipping region
2. Do the same after setting a clipping region
3. First use Find Element and highlight existing element and region

Input Methods – what they target



The screenshot shows a window titled "frmAnyTeller" with a date of "13-Oct-15" and time of "1:32:24 PM". The main heading is "XYZ BANK". Below this, there's a "Transaction" section with radio buttons for "Deposit" (selected), "Withdrawal", and "Split Deposit". A "Configuration" section has checkboxes for "Use Cash Count" (checked), "Use Piece Count", "Use Amount", "Use Both", "Reverse Denomination", and "Eliminate \$2". The main area is titled "Deposit Transaction" and contains fields for "Account #: 309102567", "Transaction #: 177339", "Cash In" (with a "Cash Count" button), "On Us Check", "Not On Us Check", and "Total Deposit" (showing "\$0.00"). At the bottom, there's a "Scale" section with a slider and a table with columns "Type" and "Amount".

A control labeled "T Typelnto" with an upward arrow icon.

A control labeled "Click" with a mouse cursor icon and an upward arrow icon.

SendWindowMessages	<input type="checkbox"/>
SimulateType	<input type="checkbox"/>

SendWindowMessages	<input type="checkbox"/>
SimulateClick	<input type="checkbox"/>

SendWindowMessages	<input checked="" type="checkbox"/>
SimulateType	<input type="checkbox"/>

SendWindowMessages	<input checked="" type="checkbox"/>
SimulateClick	<input type="checkbox"/>

SendWindowMessages	<input type="checkbox"/>
SimulateType	<input checked="" type="checkbox"/>

SendWindowMessages	<input type="checkbox"/>
SimulateClick	<input checked="" type="checkbox"/>

Input methods - comparison

	<i>Uses the driver</i>	<i>Uses OS Window Messages</i>	<i>Uses software's tech</i>	<i>Can add hotkeys</i>	<i>Works in background</i>	<i>Application needs to be in foreground</i>
Hardware events	✓			✓		✓
Window Messages		✓		✓	✓	
Simulate Type/Click			✓		✓	

Exercise 2: set the font in notepad

Set and read font, size, style in notepad without using the recorder

1. navigate to the font popup window
2. set font, size and style, choose the script
3. read the size and style
4. use variables and correct scopes

Output methods - Screen scraping

	<i>Speed</i>	<i>Accuracy</i>	<i>Works in Background</i>	<i>Gets text position</i>	<i>Gets hidden text</i>	<i>Works with Citrix</i>
Full Text	fastest	100%	✓		✓	
Native	fast	100%		✓		
OCR	slow	98%*		✓		✓

OCR Engines

	<i>More languages</i>	<i>Preferred area size</i>	<i>Can invert colors</i>	<i>Set expected text format</i>	<i>Filter allowed characters</i>	<i>Better on Microsoft Fonts</i>
Google Tesseract	can add	small	✓	✓	✓	
Microsoft Modi	default	large				✓

Exercise 3: OCR engines

Scrape the text from this page using the OCR engines

1. demonstrate languages and expected formats
2. try invert colors

Some text here

And some other fonts

and a few numbers 1234001231310235

The same text here but on black

And some other fonts

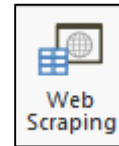
and a few numbers 1234001231310235

Web scraping

Is a fast atomic way of extracting structured data from the web, even paginated data

- Lists
- Correlated data
- Tables

You can use the Web Scraping wizard
or Extract Structured Data activity (for experts)



Exercise 4: web scraping

Extract correlated data from Amazon books

1. navigate to Amazon and search for 'automation books'
2. extract a list of titles
3. extract a custom table made out of titles, authors and prices
4. if possible, do that in background

Background automation overview

	<i>Background</i> <i>Robot doesn't bother user</i>	<i>Foreground</i> <i>Robot needs the control for a while</i>
Input	Simulate type Window Message Check (a checkbox) Select Item (from a listbox) Set Text	Default (hardware event) Using a clipping region Paste (From clipboard)
Output	Full text Get text Web scraping	Native OCR Copy Selected Text

Problem 1: read structured data

Extract financial data structured as a table from "<http://finance.yahoo.com/>"

1. Navigate to historical data of the New York stock exchange index
2. Robot should read all the table with data from past days
3. If possible, we would like to do that in background

Best Practices

For the specific application that you are trying to automate, try in order
SIMULATE CLICK/TYPE -> WINDOWS MESSAGE -> HARDWARE EVENT

Use Google Tesseract OCR engine for smaller areas and Microsoft MODI for larger ones

Use containers, especially when you perform more actions on the same window

Declare variables in the innermost scope needed



Q&A



Test

Online resources

- Ui [How do you perform background automations](#)
- Ui [Screen scraping example](#)
- Ui [Screen scraping video](#)
- Ui [Scraping from a terminal](#)
- Ui [Web data extraction](#)
- Ui [How to extract HTML tables](#)