

# Operations based ODF editing with OX Documents

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# Bio

## ODF since it's very beginning

- **1991-2011:** StarOffice and OpenOffice.org
  - › From junior developer to senior developer and technical architect
  - › Focus on text editing, security and accessibility
  - › Author of Sun's ODF Plugin for Microsoft Office
  - › Member OASIS ODF TC, Accessibility SC
- **2012 - today:** OX Documents
  - › Document editing again - now in the browser
  - › In the team: 14 former colleagues from the Hamburg OpenOffice.org team
  - › <http://techblog.open-xchange.com/>

# OX Documents

## Customer Requirements

### Availability

Edit your documents anywhere. On any device, including mobile.  
In the browser.

### Documents

Edit Open Office (ODF) and Microsoft Office (OOXML) documents.  
View and convert documents in many different formats, including PDF.

### Round-trip

**Interoperability with other office products.**  
**Preserve content and layout of complex documents.**

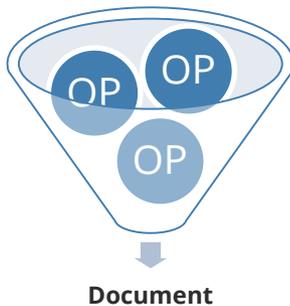
### Collaboration

Work together on shared documents.  
See other's people edits – in real-time.

# OX Documents

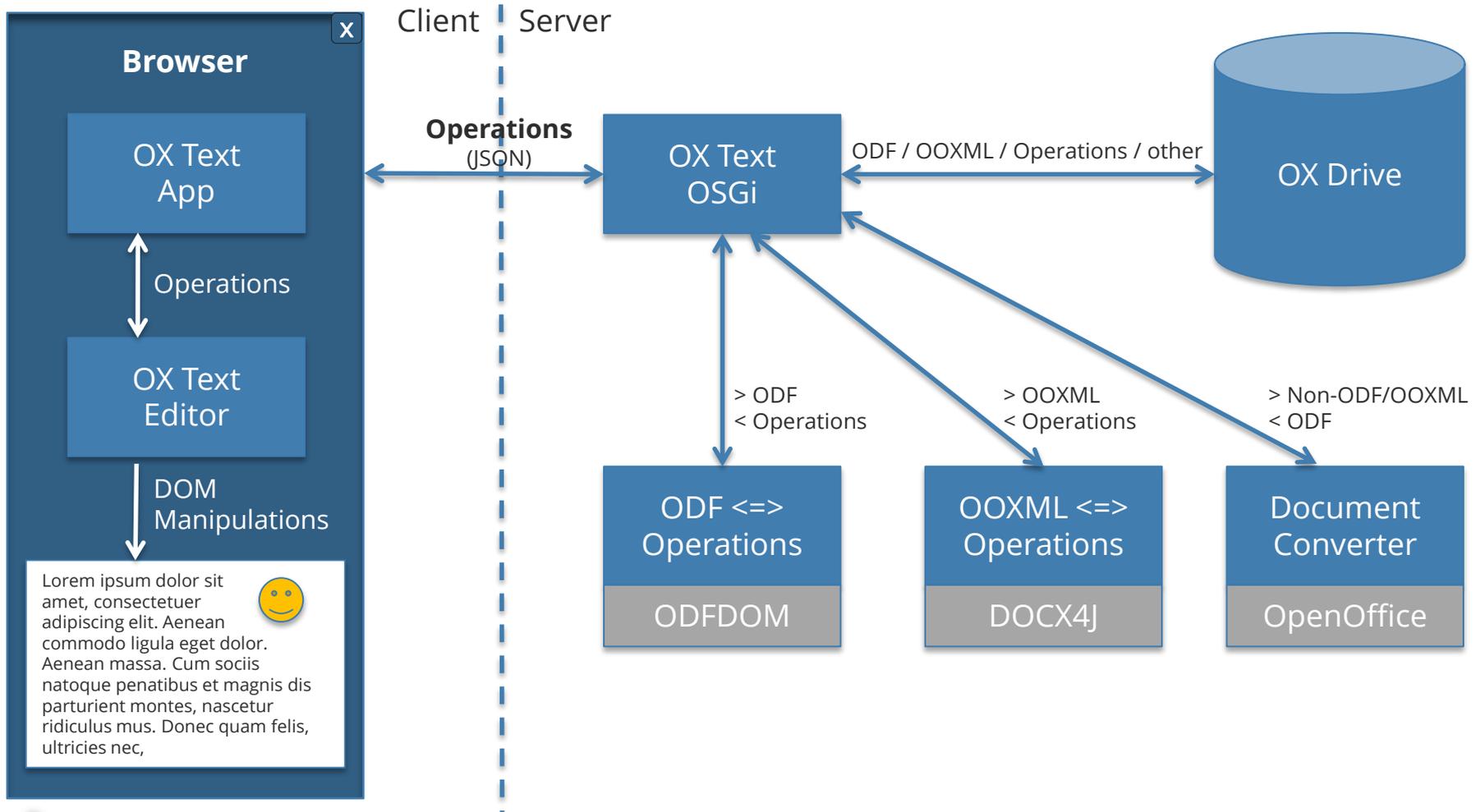
## Key Concept: Operations

### Operations



- Describe document changes and entire document
  - Examples: *insertParagraph*, *insertText*, *setAttributes*
- Abstraction of file formats
- Building block for “[Operational Transformation](#)” (OT)
- Allow collaborative editing
- Used in Client-Server communication, could also be used for macro recording, scripting, ...

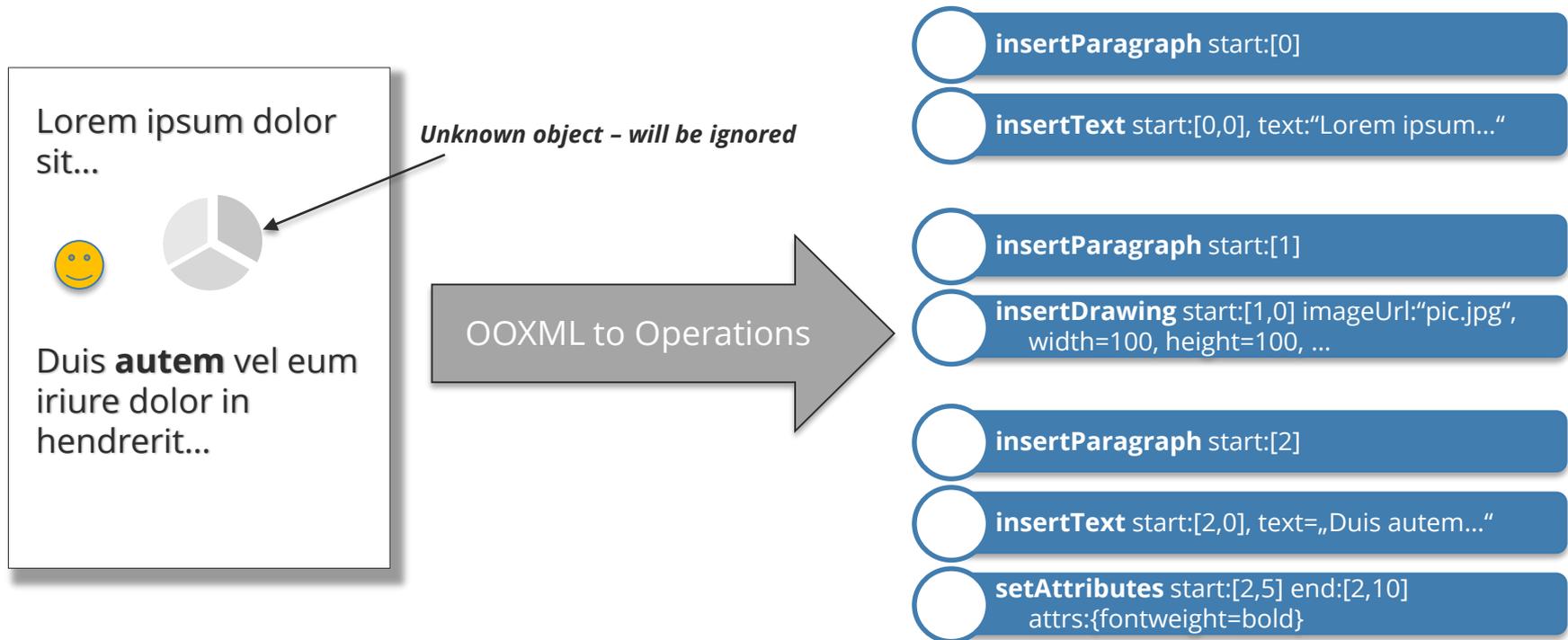
# Architecture Overview



# Operations Processing

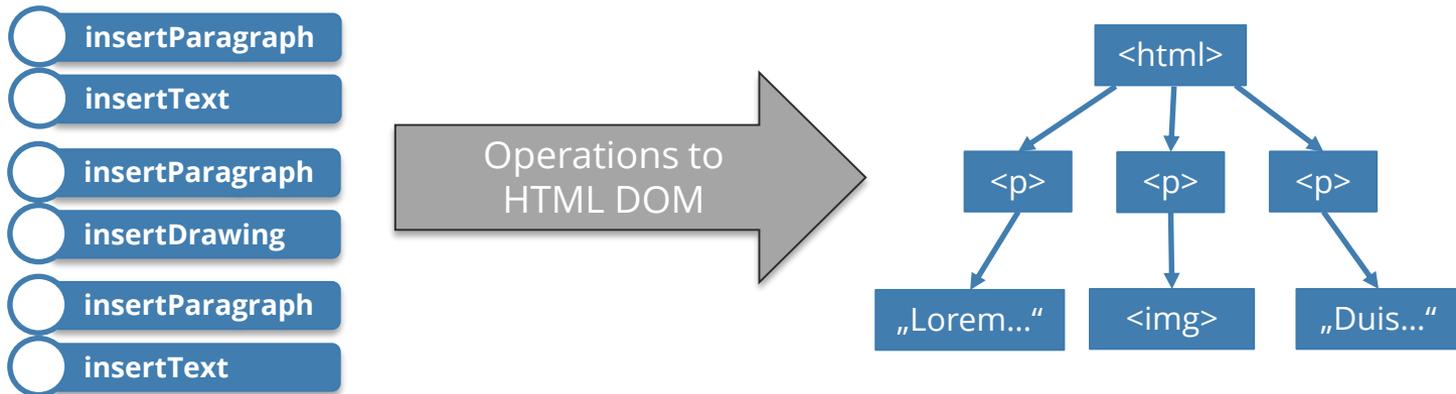
## Step 1 – Decomposing the document (on server)

Operations describe how to manipulate the document – including how to build it up from scratch

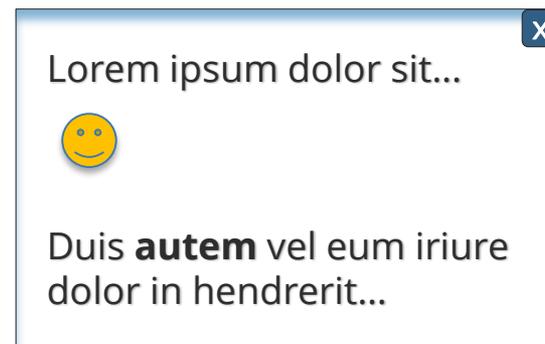


# Operations Processing

Step 2 – Apply operations to editor (on client)

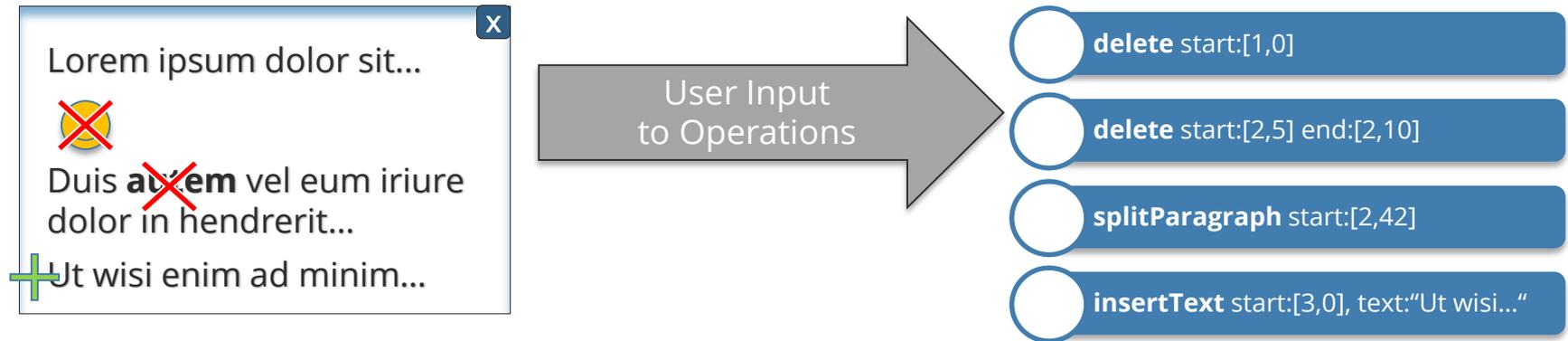


The browser will do the layout and the rendering



# Operations Processing

## Step 3 – Edit document in browser (on client)

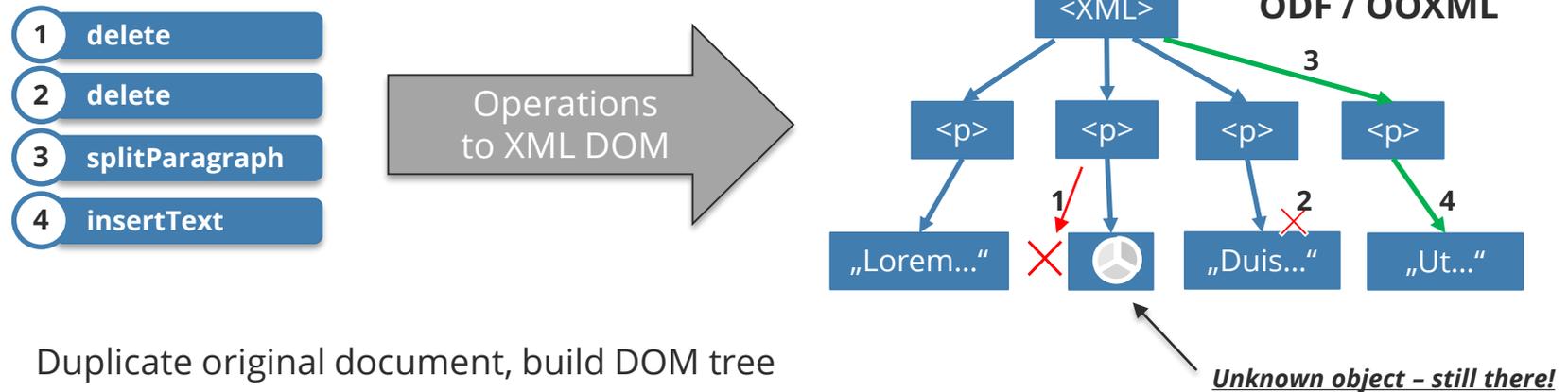


- Intercept all events – do not let the browser do any DOM manipulations
- Create operations for desired document manipulations
  - For mouse/keyboard input as well as for actions triggered in the user interface
- Apply these operations to HTML DOM
  - The browser will display the updated document
- Send operations to the server - for persistence and for further distribution

# Operations Processing

## Step 4 – Apply operations to document (on server)

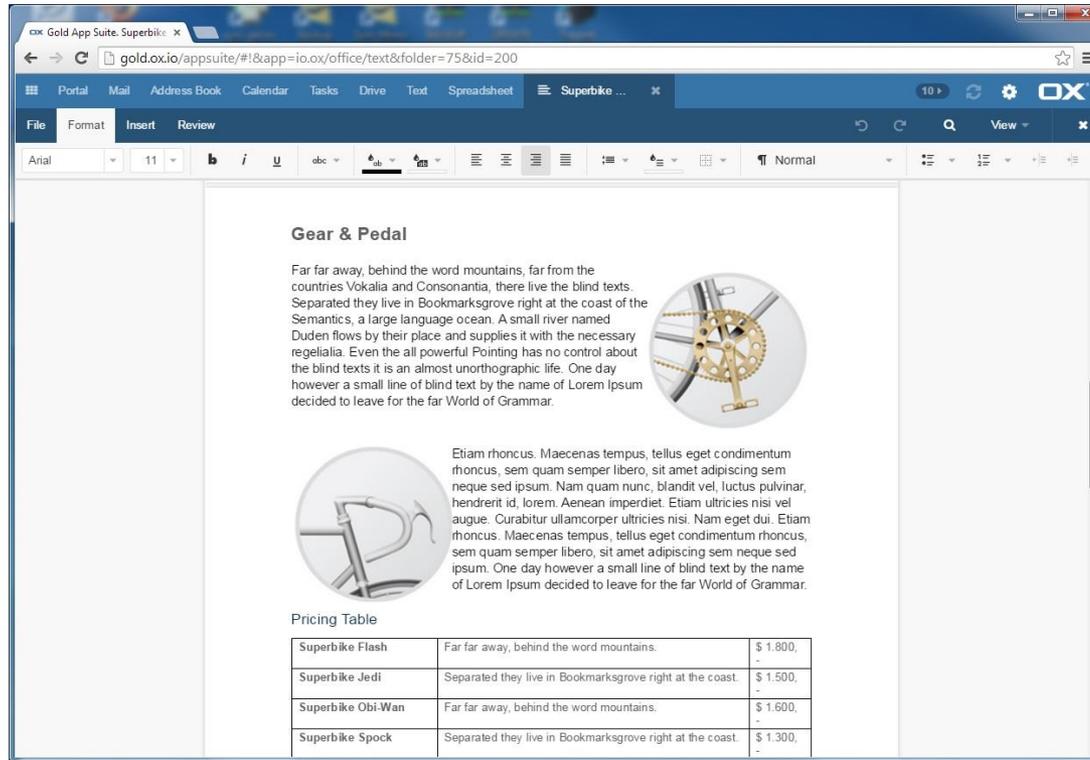
- This step is optional (for supporting legacy applications)
  - It would also be possible to just make the operations list persistent



- Duplicate original document, build DOM tree
- Use only the newly created operations to update the DOM tree
- **Do not touch any DOM nodes that you don't understand or don't care about, so the round-trip is nearly perfect!**

# Operations Processing

## Demonstration in OX App Suite



The screenshot displays the OX App Suite interface for editing a document. The browser address bar shows the URL `gold.ox.io/appsuite/#!&app=io.ox/office/text&folder=75&id=200`. The document title is "Superbike". The interface includes a menu bar with "File", "Format", "Insert", and "Review". The "Format" ribbon is active, showing options for font (Arial, size 11), bold, italic, underline, and text color. The document content includes:

### Gear & Pedal

Far far away, behind the word mountains, far from the countries Vokalia and Consonantia, there live the blind texts. Separated they live in Bookmarksgrove right at the coast of the Semantics, a large language ocean. A small river named Duden flows by their place and supplies it with the necessary regalia. Even the all powerful Pointing has no control about the blind texts it is an almost unorthographic life. One day however a small line of blind text by the name of Lorem Ipsum decided to leave for the far World of Grammar.



Etiam rhoncus. Maecenas tempus, tellus eget condimentum rhoncus, sem quam semper libero, sit amet adipiscing sem neque sed ipsum. Nam quam nunc, blandit vel, luctus pulvinar, hendrerit id, lorem. Aenean imperdiet. Etiam ultricies nisi vel augue. Curabitur ullamcorper ultricies nisi. Nam eget dui. Etiam rhoncus. Maecenas tempus, tellus eget condimentum rhoncus, sem quam semper libero, sit amet adipiscing sem neque sed ipsum. One day however a small line of blind text by the name of Lorem Ipsum decided to leave for the far World of Grammar.

#### Pricing Table

Superbike Flash	Far far away, behind the word mountains.	\$ 1.800,-
Superbike Jedi	Separated they live in Bookmarksgrove right at the coast.	\$ 1.500,-
Superbike Obi-Wan	Far far away, behind the word mountains.	\$ 1.600,-
Superbike Spock	Separated they live in Bookmarksgrove right at the coast.	\$ 1.300,-

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