

Rendering ROIs of Medical Images on Mobile Browsers

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Regions of Interests (ROIs) of Medical Images

Good Health Clinic Consultation Note - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Good Health Clinic Consultation Note

Patient: Henry Levin , the 7th MRN: 12345
Birthdate: September 24, 1932 Sex: Male
Consultant: Robert Dolin , MD Created On: April 7, 2000

Lung exam

The ROIs are depicted by white polygon.

The overlay shapes of ROI

History of Present Illness

Applications

- Remote consultation
- Mobile health
- Mobile PHR

Proposed Method (1/3)

- HL7 Clinical Document Architecture (CDA)
 - Offers basic interoperability at the document level
 - Widely popular
- “RegionOfInterest” entry
 - Derived from “Observation” class of the V3 Reference Information Model (RIM)
 - Can be used for specifying various shapes to represent ROIs
- How to render the shapes?
→ XSLT (Extensible Stylesheet Language Transformations)

Proposed Method (2/3)

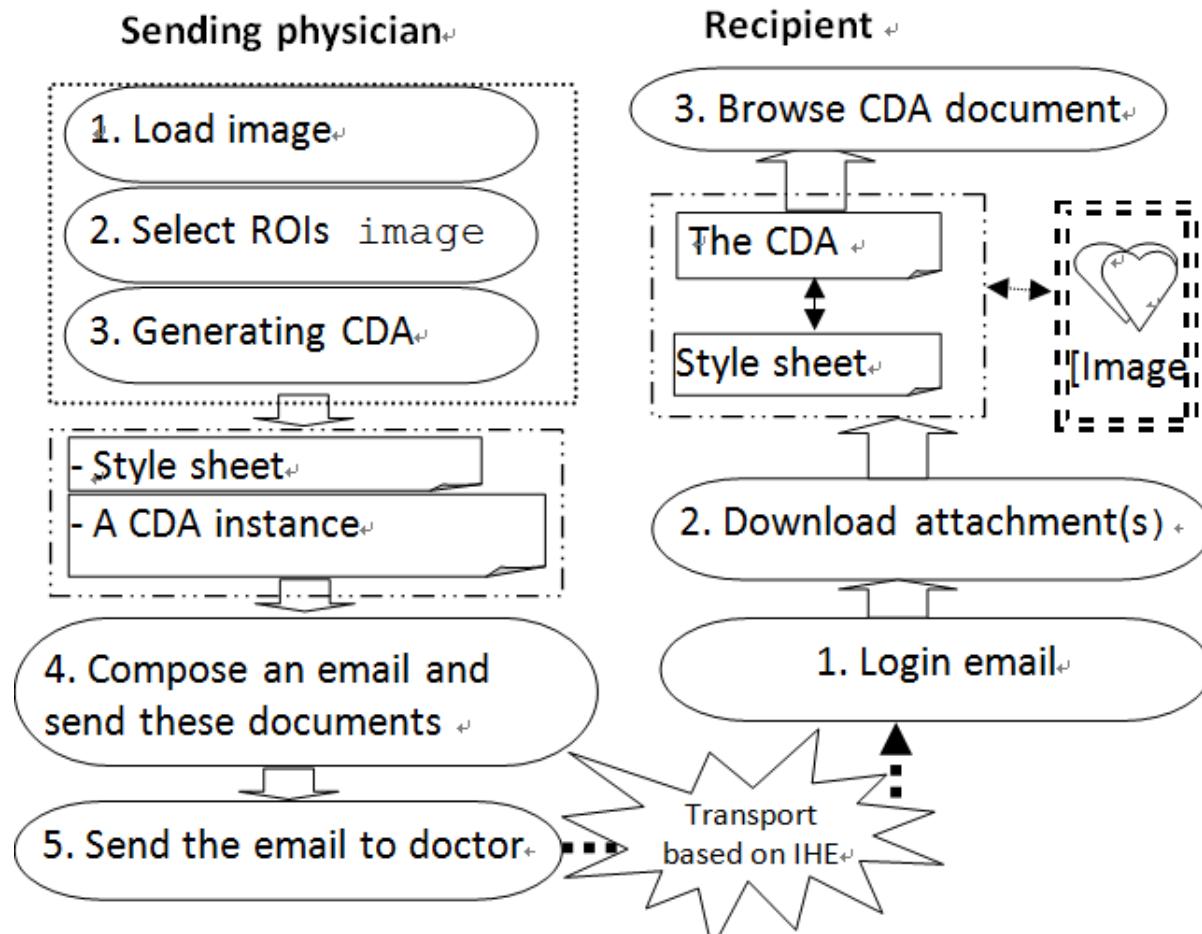
```
<?xml version="1.0"?>
<xslstylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
  xmlns:cd2="urn:hl7-org:v3" xmlns:cd3="urn:hl7-org:v3/meta/voc"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:cd1="http://www.w3.org/1999/xhtml"
  xmlns:voc="urn:hl7-org:v3/voc">
<!--
<xsl:template match="cd2:renderMultiMedia" (1)
  <xsl:variable name="imageRef" select="@referencedObject"/>
  <xsl:choose>
    <xsl:when test="//cd2:regionOfInterest[@ID=$imageRef]">
<xsl:if test='//cd2:regionOfInterest[@ID=$imageRef]//cd2:observationMedia/cd2:value[@mediaType="image/gif" or @mediaType="image/jpeg"]'>
...
</xsl:when>
<xsl:otherwise>
</xsl:otherwise>
</xsl:choose>
</xsl:template>
<!--
<xsl:template match="cd2:ClinicalDocument">
  <html>
    <head>
...
<style type="text/css" (2)
  body > div
{...}
</style>
<script type="text/javascript">
  window.onload = init; (3)
(➔ continued)
```

Proposed Method (3/3)

```
function init
{
    ...
    invokeEmbeddedROI.appendChild(createLine(x1*,y1*,x2*,y2*,distance*));
}

var d= SupplementalPixels(browserID, ScreenOrientationType);
function createLine(x1,y1+d,x2,y2+d,distance) (4)
{
    ...
    return line;
}
function SupplementalPixels(browserID, ScreenOrientationType)
{
    ...
    return numberOfrSuplementations;
}
</script>
</head>
<body>
<div id="MyID" style="position:relative;height:0px;width:0px;">(5)
</div>
</body>
</html>
</xsl:template>
```

Workflow



Scope

- Develop a CDA Implementation Guide
- Develop an XSLT template to render shapes on medical images
- Assure interoperability on mobile browsers as well as desktop browsers

Goals

A screenshot of a mobile web browser displaying a consultation note. The address bar shows the URL 155.230.118.94//sar. The page title is "Good Health Clinic Consultation Note". Below the title, there is a table with patient information:

Patient:	Henry Levin , the 7th	MRN:	12345
Birthdate:	September 24, 1932	Sex:	Male
Consultant:	Robert Dolin , MD	Created On:	April 7, 2000

Below the table, a section titled "Lung exam" contains the text: "The ROIs are depicted by white polygon." An axial CT scan of the lungs is shown, with several white polygons overlaid on the image, indicating regions of interest (ROIs). At the bottom left, there is a link labeled "History of Present Illness".

A screenshot of a desktop web browser window titled "Good Health Clinic Consultation Note - Mozilla Firefox". The page content is identical to the mobile version, showing the same patient information table and "Lung exam" section.

The "Lung exam" section includes the text: "The ROIs are depicted by white polygon." Below this text is an axial CT scan of the lungs with white polygons overlaid. A speech bubble points to one of the polygons with the text: "The overlay shapes of ROI". At the bottom of the image, there is a link labeled "History of Present Illness".