Information Realisation:
Textual, Graphical and Audial Representations of the Semantic Web

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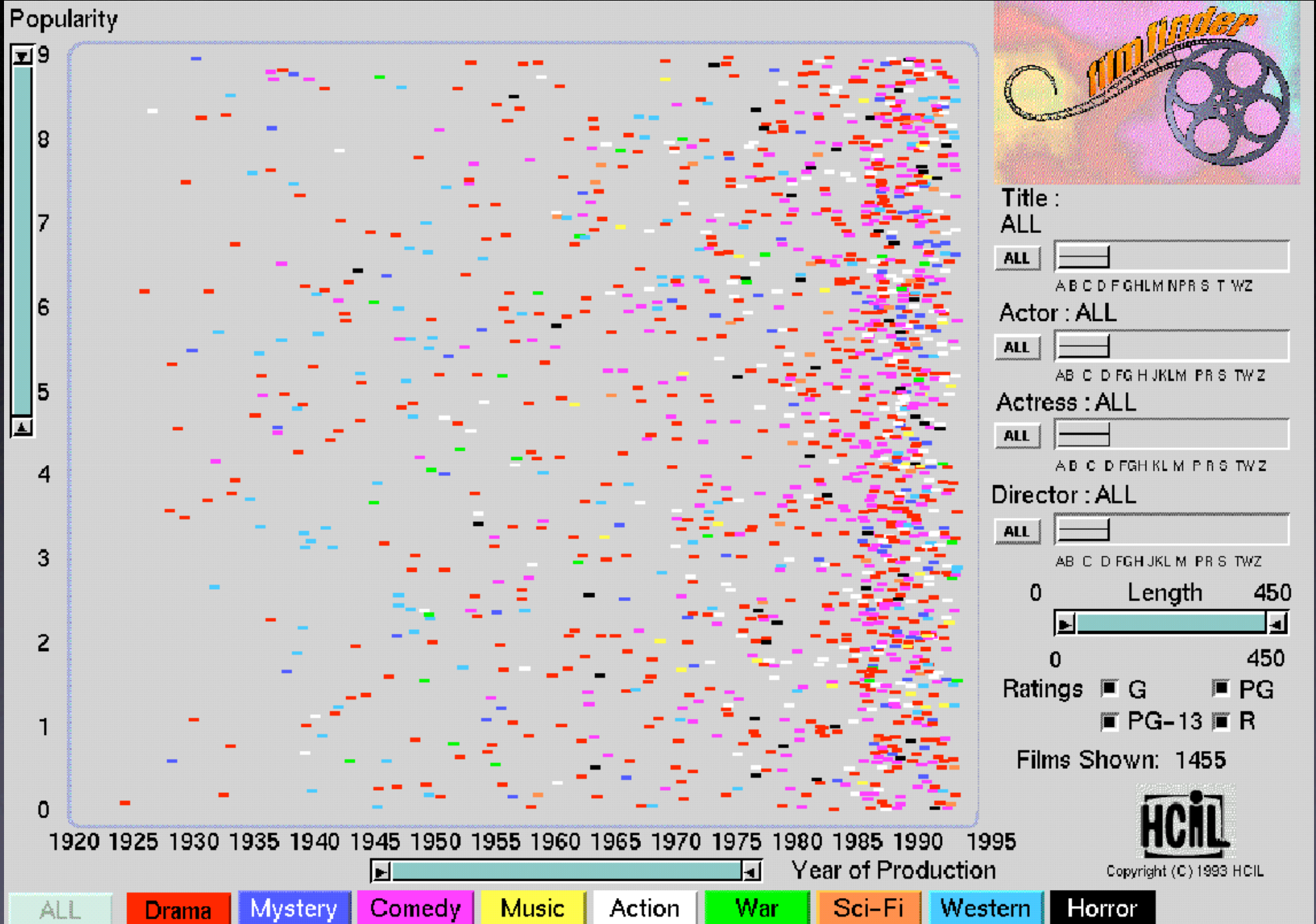
PRIFYSGOL CYMRU ABERTAWE
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Grupo de Investigação em Engenharia
do Conhecimento e Apoio à Decisão
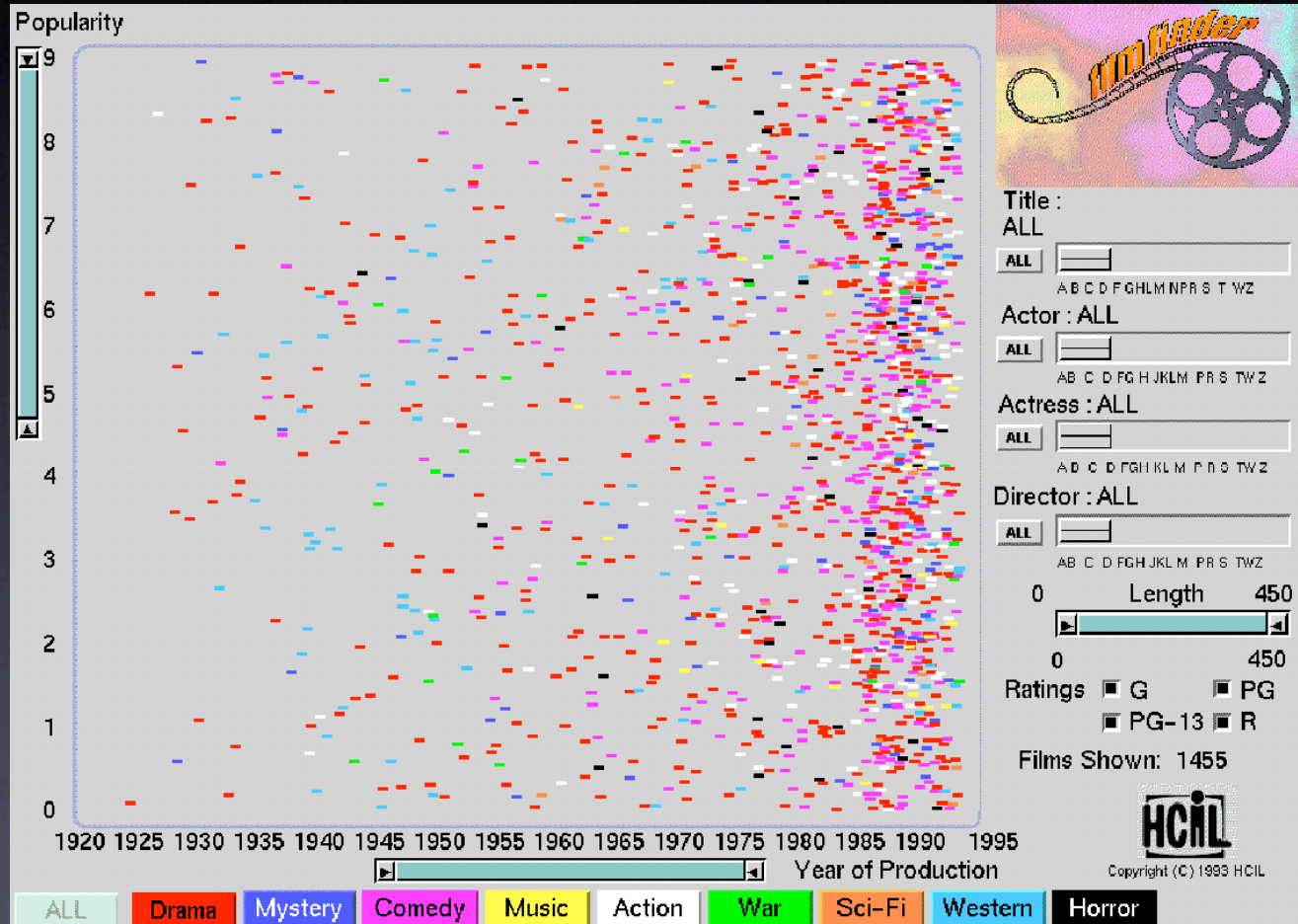
Contents

- Motivations

- Automatic Visualization

  - BBC Top 40 Music Chart

- Ontologies

- Multi-modal

  - Audial and Textual

- Summary

FilmFinder [University of Maryland, Ahlberg and Schneiderman, 1994]

Which areas can be improved?

- Proprietary
- Closely coupled
- Domain specific
- Labour Intensive
- Non-inclusive

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What can help us?

- Semantically rich formats (XML, RDF)
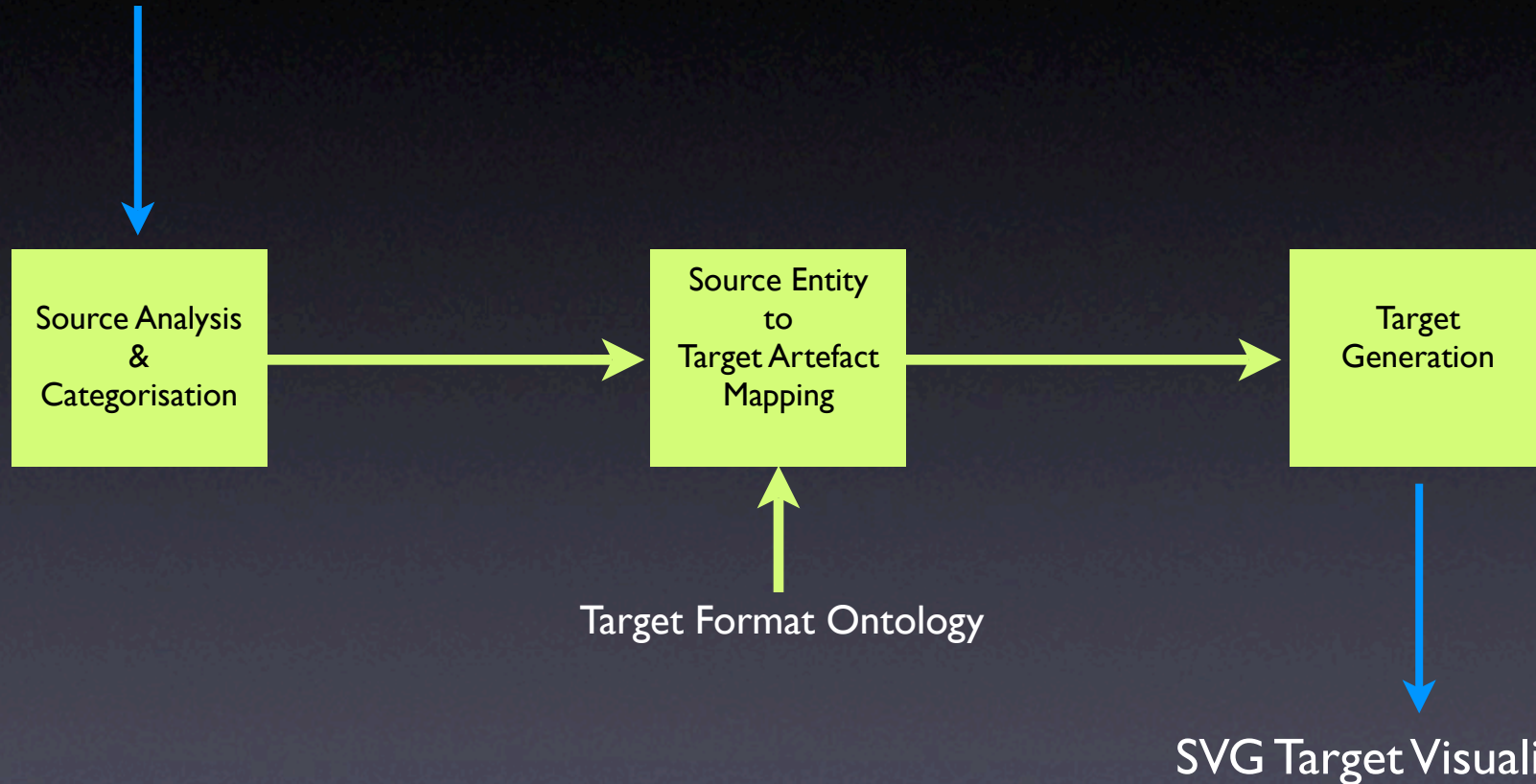- Information / Ontology Mapping
- Ontologies

BBC Top 40 Music Chart

- Real life information

- Exposed as XML feed

- Automatic Visualization into SVG

12	10	(5)	**Snow Patrol**
			Chasing Cars
			(Fiction)
			http://www.snowpatrol.com/
13	7	(8)	**Lily Allen**
			Smile
			(Regal Recordings)
			http://www.lilyallenmusic.com/
14	NEW ★	(-)	**Alesha**
			Lipstick
			(Polydor)
			http://www.aleshamusic.com/
15	NEW ★	(-)	**Ronan Keating**
			Iris
			(Polydor)
			http://www.ronankeating.com
16	6	(4)	**Paris**
			Stars Are Blind
			(Warner Bros)
			http://parishiltonrecord.com/
17	9	(7)	**Paolo Nutini**
			Last Request
			(Atlantic)
			http://www.paolonutini.com/
18	11	(9)	**Kooks**

Information Realisation Process

Top40 XML Source

Source Analysis & Categorisation → Source Entity to Target Artefact Mapping → Target Generation

Target Format Ontology

SVG Target Visualization

Top40 Source (extract)

```
<top-forty>

    <chart position="1">
        <lastweek>1</lastweek>
        <weeks>(5)</weeks>
        <artist>Gnarls Barkley</artist>
        <title>Crazy</title>
    </chart>
    . . .
<top-forty>
```

Top40 Source Analysis

Source Data Entity	Value Type	Category	Uniqueness
top-forty	-	Container (Root)	-
chart	-	Container (Object)	-
position	Integer	Quantitative	40 values (1.0)
lastweek	Integer (0.7), String(0.3)	Quantitative	29 values (0.73)
weeks	String	Nominal	12 values (0.3)
artist	String	Nominal	40 values (1.0)
title	String	Nominal	40 values (1.0)

SVG Target Analysis

Target Artefact	Value Type	Category	Uniqueness Ability
svg	-	Container (Root)	-
rectangle	-	Container (Object)	-
x	Integer	Quantitative	High
y	Integer	Quantitative	High
width	Integer	Quantitative	High
height	Integer	Quantitative	High
fill-colour	String	Nominal	Low
text-label	String	Nominal	High

Top40 Source Entity to SVG Target Artefact Mapping

Top40 Source

Source Data Entity	Category
top-forty	Container (Root)
chart	Container (Object)
position	Quantitative
lastweek	Quantitative
weeks	Nominal
artist	Nominal
title	Nominal

SVG Target

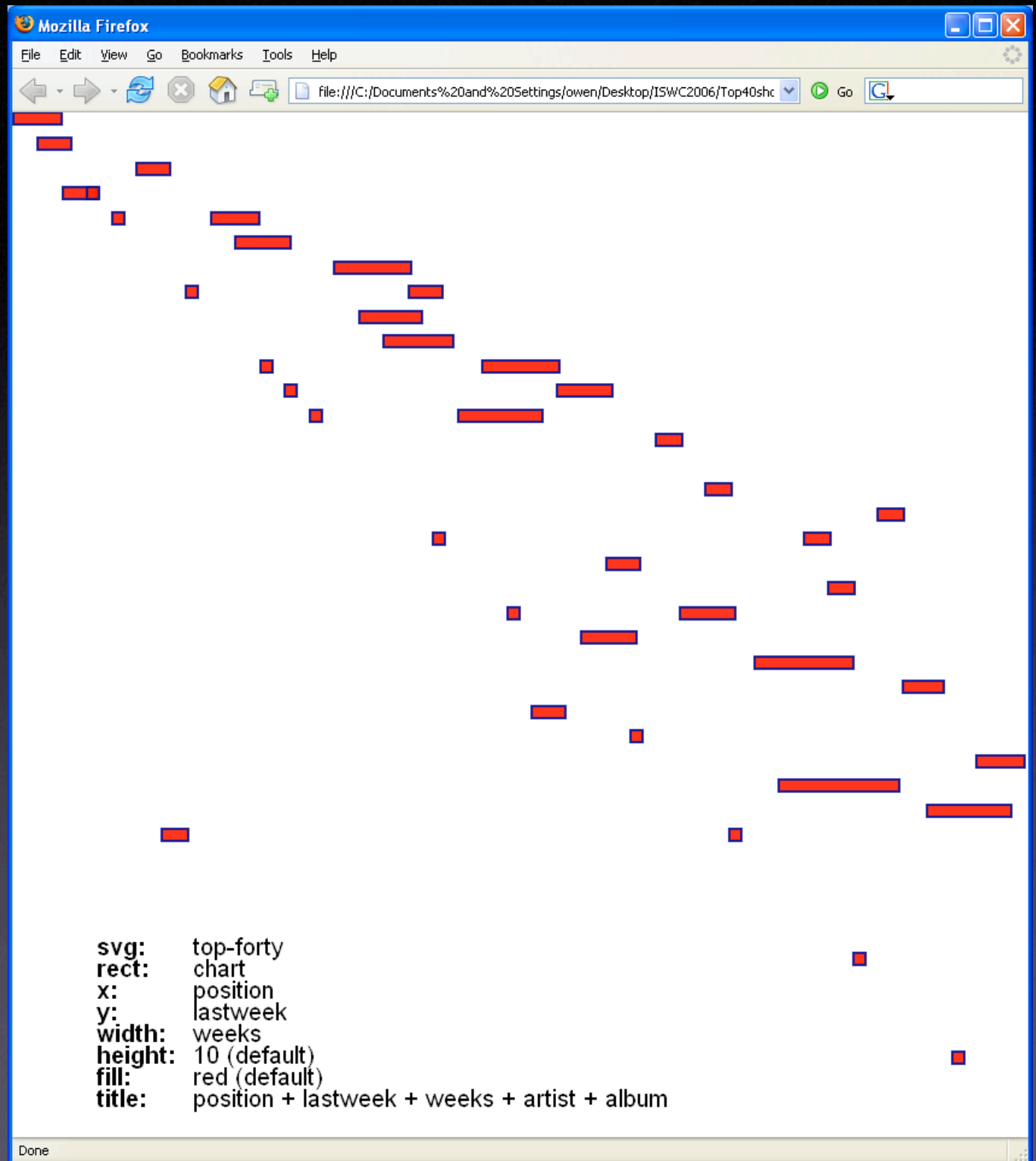| Target Artefact	Category
svg	Container (Root)
rectangle	Container (Object)
x	Quantitative
y	Quantitative
width	Quantitative
height	Quantitative
fill-colour	Nominal
text-label	Nominal
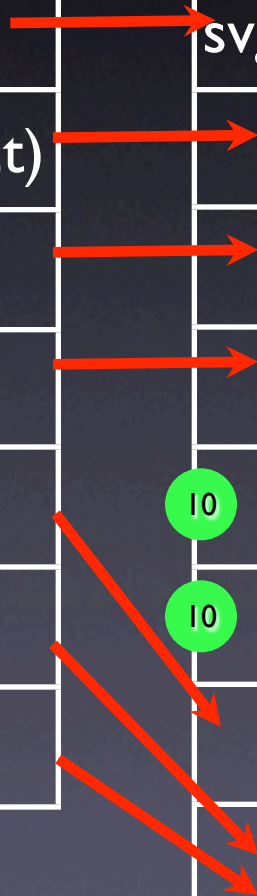
BBC Top 40 Music Chart

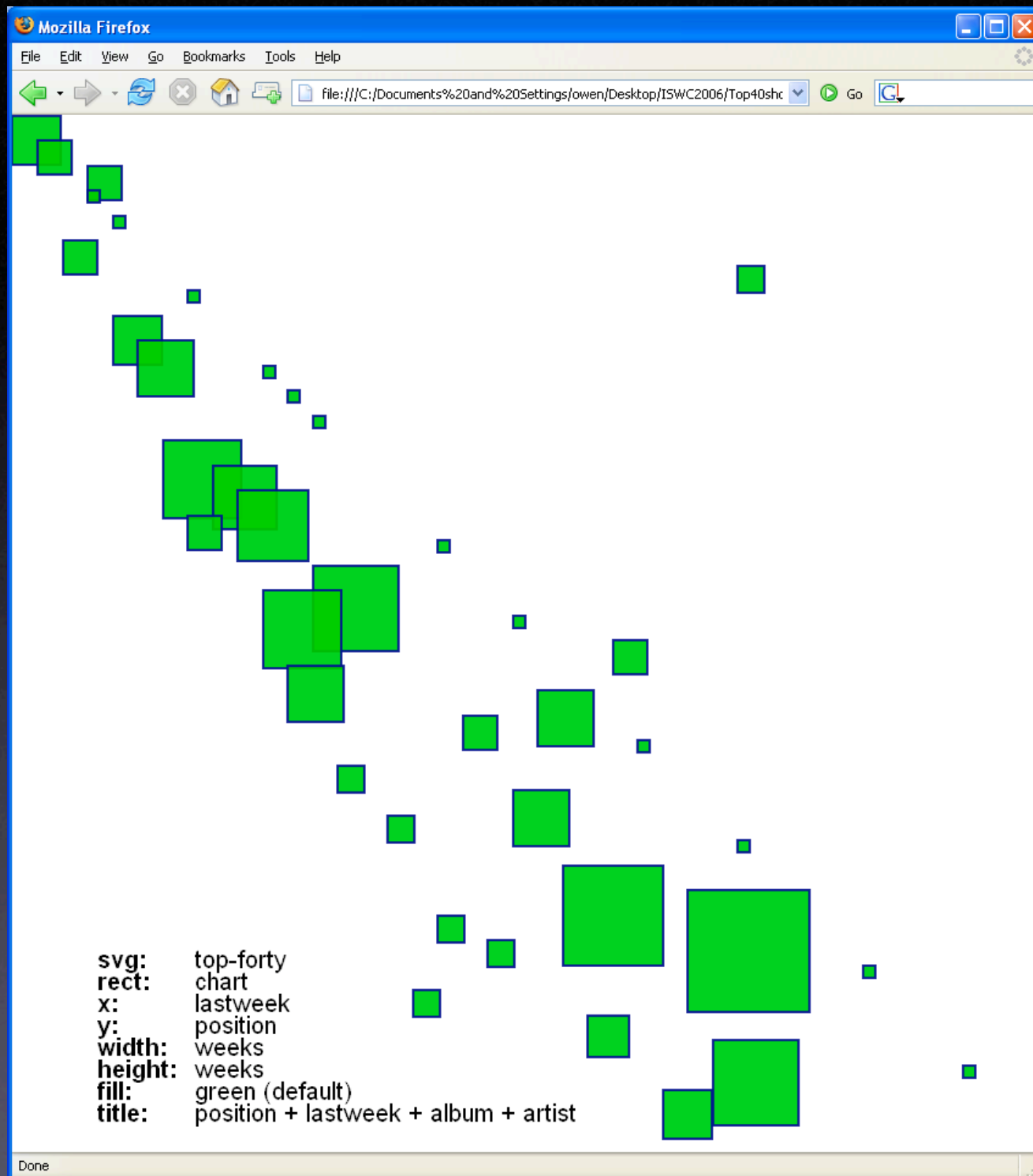## Visualization 1:

Automatic Visualization (no human involvement)
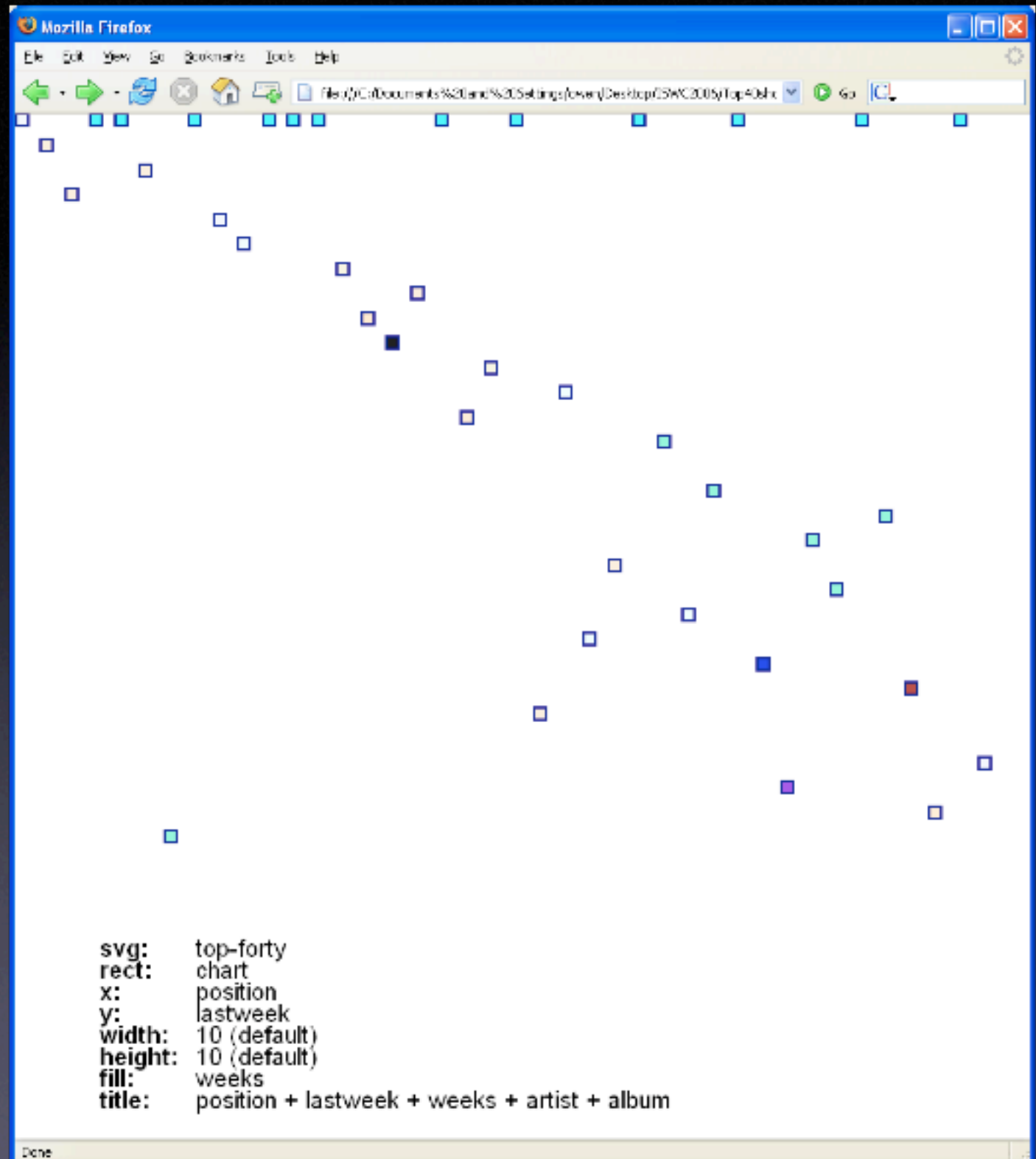
BBC Top 40 Music Chart
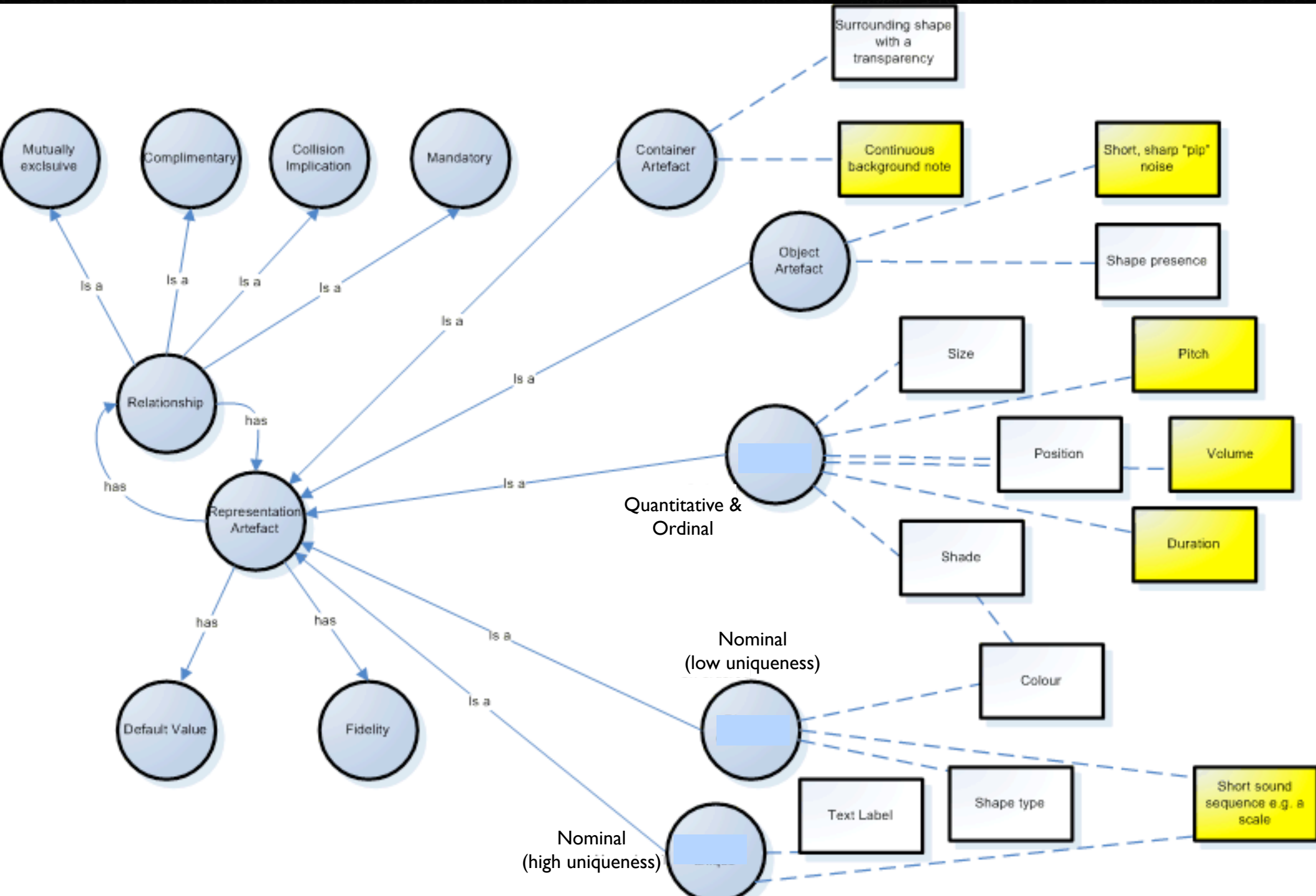
Visualization 2:

With Data Cleansing

svg: top-forty
rect: chart
x: position
y: lastweek
width: weeks
height: 10 (default)
fill: red (default)
title: position + lastweek + weeks + artist + album

BBC Top 40
Music Chart

Visualization 3:

With Data
Cleansing

and

Mappings
Tweaking

svg: top-forty
rect: chart
x: lastweek
y: position
width: weeks
height: weeks
fill: green (default)
title: position + lastweek + album + artist

Information Realisation

- Automatic
  - Analysis / categorisation of source
  - Mapping source *entities* to target *artefacts*

- Multi-modal

SoundXML

```
<Song>

    <Note Instrument="Piano" Pitch="A" Octave="4" Duration="Eighth" Volume="100" />

    <Note Instrument="Piano" Pitch="C" Octave="4" Duration="Quarter" Volume="100" />

    <Note Instrument="Piano" Pitch="G" Octave="4" Duration="Half" Volume="100" />

    <Note Instrument="Trumpet" Pitch="G" Octave="4" Duration="DottedHalf" Volume="100" />

</Song>
```

SoundXML Target Analysis

Target Artefact	Value Type	Category	Uniqueness Ability
song	-	Container (Root)	-
note	-	Container (Object)	-
instrument	String	Nominal	High
pitch	String	Ordinal	Medium
octave	Integer	Quantitative	Medium
duration	String	Ordinal	Medium
volume	Integer	Quantitative	Medium

Top40 Source Entity to SoundXML Target Artefact Mapping

Top40 Source

Source Data Entity	Category
top-forty	Container (Root)
chart	Container (Object)
position	Quantitative
lastweek	Quantitative
weeks	Quantitative
artist	Nominal
title	Nominal

SoundXML Target

Target Artefact	Category
song	Container (Root)
note	Container (Object)
instrument	Nominal
pitch	Ordinal
octave	Quantitative
duration	Ordinal
volume	Quantitative

Summary

- InfoViz usually closely-coupled

- BUT, it's a Mapping Problem

- Exploit Ontologies / Mapping

- Information Realisation

  - Automatic (or at least assisted)

  - Multi-modal

Thank you