Edinburgh Pathway
Editor
EPE 2.0

www.bioinformatics.ed.ac.uk/epe
History of EPE

- 1995: Visual Editor for EMP/WIT
- 1999: DB of Human & E.coli metabolism
- 2002: Initiated GSK Project
- 2003: Internal Release 1
- 2005: Transfer to UoE
- 2005/10: Public Release
- 2006/7/12: Release 1.1, 1.3, 2.0, 3.0a
- 2008/8: "Refactoring"
- 2009/2: Current version
Demo of EPE 3.0
Visual Editor & SB Framework

Graphical Notation Definition and Services Framework

Visualisation/Editor

DB

Notation Subsystem API

Metabolic
SBGN-PD
SBGN-ER
Cytoscape

Plugin 1
Plugin 2
Cytoscape plugin

Compound Graph Library
Compound Graph Library

- Java 5+
- Uses Generics
- Extensible
- Copy
- Move
- Delete
- Selection
- Undo/Redo

http://sourceforge.net/projects/epe
Notation Subsystem Services

- Notation definition
  - Glyphs
  - Notation Syntax
- Notation Validation
  - Notation semantics
  - Layout guidelines
- Notation DOM
  - API describing what the notation means
- Context conversion
  - To different notations
  - Upgrade to new version
- Autolayout
  - Notation specific layout rules
- Import/Export
  - Pathways from databases
  - From other applications
Drawing Primitives

Shape Primitive
- Object Type
- Shape Type
- Appearance
- Annotation

Link Primitive
- Object Type
- Line Style
- Annotation
- End Decorator Type
- Appearance

Terminus Dec Type
- Appearance
- Attributes
Object Types – Syntax Defn

Shape Parenting

<table>
<thead>
<tr>
<th>Parent</th>
<th>Shape OT A</th>
<th>Shape OT B</th>
<th>Shape OT C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shape OT A</td>
<td>T</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>Shape OT B</td>
<td>F</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>Shape OT C</td>
<td>T</td>
<td>T</td>
<td>F</td>
</tr>
</tbody>
</table>

Link Connectivity

<table>
<thead>
<tr>
<th>Connects to</th>
<th>Shape OT A</th>
<th>Shape OT B</th>
<th>Shape OT C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Link OT 1</td>
<td>S</td>
<td>T</td>
<td>-</td>
</tr>
<tr>
<td>Link OT 2</td>
<td>S</td>
<td>-</td>
<td>T</td>
</tr>
<tr>
<td>Link OT 3</td>
<td>S</td>
<td>S</td>
<td>T</td>
</tr>
</tbody>
</table>
Notation Subsystem Builder

- Spec File
- CA Code Generator
- Hand Coding of Additional Services
- Developer
- CA Package
- Syntax Service + Unit Tests
- NDOM
- JavaDoc
- EPE 2.0
Example Ca File

```ca
/**< *
 * Basic cytoscape notation subsystem
 */
context uk.ac.ed.inf.csb.BasicCytoscape (name = "Basic Cytoscape Context" descr="Context to test code generation of a basic cytoscape" version=1.0.0)

property Interacts (name="interacts" descr="interaction between two nodes" type=simple visualisable)

RMO  ( contains [Node])
shape Node (name="Node" descr="node"
  stype = ELLIPSE
  size = [50,50]
  contains []
)

link Edge (name="Edge"
  lcolor = [0,0,0]
  Interacts=""
  source = Node target = [Node]
  sport = NONE (stype = RECTANGLE
    size = [0,0]
    lcolor = [0,0,0]
    fcolor = [255,255,255]
  )
  tport = NONE (stype = RECTANGLE
    offset = 0
    size = [0,0]
    lcolor = [0,0,0]
    fcolor = [255,255,255]
  )
```
```
From Diagram to Meaning
Export/Import

• Metabolic to SBML, BioPAX L2
• Import & Export to Cytoscape XGMML

Future

• SBGN-PD to BioPAX L3
• Import SBML to SBGN-PD
SBGN In EPE
PD Example
Omissions

- Names do not overflow shape
- Clone markers cumbersome
- Processes not correct
SBGN-ER
Future Directions

• Sort out process for SBGN
• On the fly decorator addition
• SVG shape definition
• Linking to Links
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• Shakir Ali

SBGN
• SBGN Community

http://sourceforge.net/project/epe