Social Network Analysis and Data Mining of Land Tenure Information in the Talking Titler System

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Outline

Context
• Complexity in tenure relationships and changes in these relationships a challenge.
• Need to collect local level records before change occurs – accept that they’ll be "disorganised"
• Examine these records e.g. stories, videos, from the bottom up – data analysis philosophy parallels with grounded theory or factor analysis

Structure
• Talking Titles approach and data model
• Exploratory experiment using changing customary system in a peri-urban area and simulated data.
• Visuals and critique of some of the graphs produced by network analysis
Early Talking Title 1999

Deed# 13391
Parcel # 6976
Interests & Obligations Vegetable Garden Right

Name John Doe
Personal ID 123456

Multimedia files VidJohnDoe

Simulation
A. Tracker Training

Restart
Data Model – Flexibility the Priority
Can relate each class to itself and each other class

Parent Classes

<table>
<thead>
<tr>
<th>Person</th>
<th>Reference Instrument</th>
<th>Land Object</th>
<th>Media Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Doe</td>
<td>14 Jones St</td>
<td>ID19420713</td>
<td></td>
</tr>
<tr>
<td>Jane Doe</td>
<td>14 Jones St</td>
<td>ID19621011</td>
<td></td>
</tr>
<tr>
<td>Arthur Other</td>
<td>14 Jones St</td>
<td>ID19621011</td>
<td></td>
</tr>
</tbody>
</table>

Relationships

<table>
<thead>
<tr>
<th>Person</th>
<th>Reference Instrument</th>
<th>Land Object</th>
<th>Media Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jane Doe</td>
<td>Daughter</td>
<td></td>
<td>Relationship: Expects to inherit house</td>
</tr>
<tr>
<td>Arthur Other</td>
<td>Adopted Son</td>
<td></td>
<td>Relationship: Expects usufruct rights</td>
</tr>
</tbody>
</table>

Parcel “Chain of Title” Network

Legend:
- Node represent Parcel
- Parcel number
- Relationship
- Note: numbers on edges mean nothing.
  They are not addressed in the article
What are we looking for in network analysis

<table>
<thead>
<tr>
<th>Weight Value</th>
<th>Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Parent/Son</td>
</tr>
<tr>
<td>2</td>
<td>Parent/Daughter</td>
</tr>
<tr>
<td>3</td>
<td>Husband/Wife</td>
</tr>
<tr>
<td>4</td>
<td>Sibling/Sibling</td>
</tr>
<tr>
<td>5</td>
<td>Grandparent/Grandchild</td>
</tr>
<tr>
<td>6</td>
<td>Other (in-law, cousin, aunt, uncle, nephew etc)</td>
</tr>
<tr>
<td>0.7</td>
<td>Lender/Borrower</td>
</tr>
<tr>
<td>0.8</td>
<td>Seller/Buyer</td>
</tr>
<tr>
<td>0.9</td>
<td>Land owner/Share cropper</td>
</tr>
<tr>
<td>0.1</td>
<td>Land surveyor</td>
</tr>
</tbody>
</table>
Person-to-Person Network

Media-Media Network – folded
Person-Media Network
Person-Person in Person-land Relationships

Person-Person folded Person-Media Relationships
Problems!

- Go out and collect and relate everything and anything – create a mess
- Did this through simulation of keywords and relationships and what does the mess look like?
- Look at the mess and then focus on particular entities (e.g. persons) or relationship types – e.g. who is selling land.
Proceeds Beneficiaries and Land Owners

Multiple Land Sales (Family A)
Conclusions

• Tool for visualising and exploring data
• May be useful in identifying strategies that people use to defend their tenure and the complex relationships involved in this.
• Useful in monitoring change and forecasting problems as relationships change
• Useful in identifying mistakes in land records
• Useful for small data sets – i.e. local level
• Getting the data – useful in future, how do we persuade people to collect data now?
• Need institutions prepared to work at micro-level