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The potential of the GRID for small scale GIS use: a proposal from the UK

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Introduction

- **“It is not enough for a handful of experts to attempt the solution of a problem, to solve it, and then apply it. The restriction of knowledge to an elite group destroys the spirit of society and leads to its intellectual impoverishment.”**

Attributed to Albert Einstein



What is the GRID?

- A distributed computer infra-structure aimed at allowing the sharing of resources, data and capacity by users of the GRID
- Founded on the concept of “virtual organisations” (VO)



The Virtual Organisation

- Real organisations coming together to share capacity
- They are assembled for a purpose and are dynamic and flexible in their membership
- Interoperability is essential, difficult to achieve and dependent on availability of good “middle ware”



The Role of Middleware in the GRID

- Middleware aims to act as the glue, or the connection between otherwise incompatible or unrelated applications.
 - Various forms of middleware exist at various levels of development, but this is an area which needs full development before GRID computing becomes the norm.
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How can the GRID work with GIS?

- The Cambridge meeting in 2003 posed the questions, “The GRID has been developed to aid e-science. Can it play a role in GIS?”
- The considered answer was definitely “yes” as GIS can look at enormous datasets and implement highly complex modelling scenarios, so any ability to share resources and capacity would be beneficial to “Big GIS”



The case for the small scale user: GRIDlet and GRIDlet-GIS

- But..
 - What about the little guys with big questions?
 - What about a farmer, worried about erosion risk?
 - What about a student, seeking sampling sites for a master's thesis?
 - What about a teacher, seeking real world examples for teaching?
 - The GRID shouldn't just give even more power to those who have it already.
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The Virtual Market Place

- GRIDlets would function as virtual marketplaces (VM) as well as the virtual organisations (VO) of the GRID.
- In VMs providers and customers (those with a resource and those needing one) make offers and contracts in a fluid, flexible environment.



Liveware for GRIDlets vs. middleware for the GRID

- Middleware is usually supported by good old *liveware*, real people interacting to make things work on a one-off basis. Dedicated middleware for a fluid, short term GRIDlet would be unviable.
- The underlying requirement of a successful VM is that all participants must gain benefit from the interaction as all participants will have to give time as well as resources to make it work.

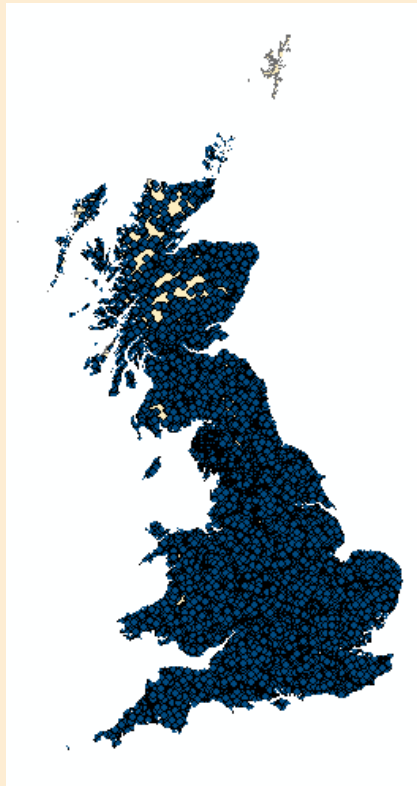


Three examples of real and potential GRIDlet-GIS scenarios

- The language historian
 - The small farmer in Central America
 - The master's research student
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Town names and their historical record - a virtual market place

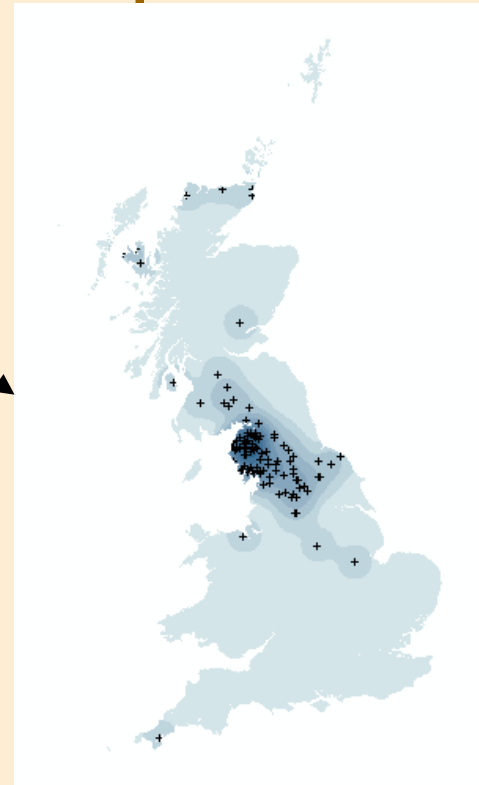


“All” (31,000) GB towns:
from Archaeology UK

A needs this

B has this

C can do this



Norwegian names:
location and density



GRIDlet-GIS in Practice

- The Rupununi GRIDlet
- A GRID-based Virtual Practice Environment for Spatial Decision Support.



Conclusions

- Bigger can be good, but is not automatically better
- Humanisation of technology will be based on making the best accessible to the most
- Please contact us if you are interested in contributing to this work.



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