

# Time, and time again

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- TIME = SPACE?

## Similarities

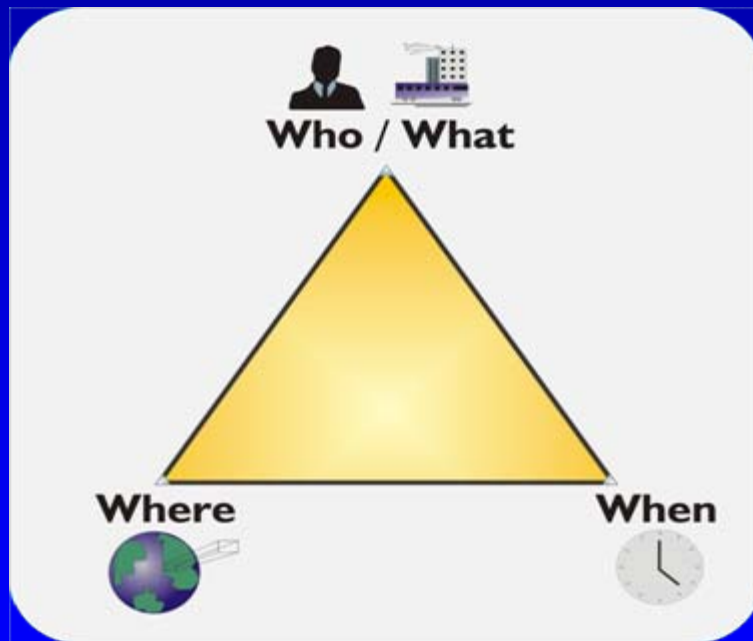
- gradual change (trajectory)
- alternative potential paths (branching)

## Differences

- time marches on
- the universal “now”
- units of measurement

**TIME IS FUNDAMENTAL AND CANNOT BE ADDED-ON**

# A multi-representation approach



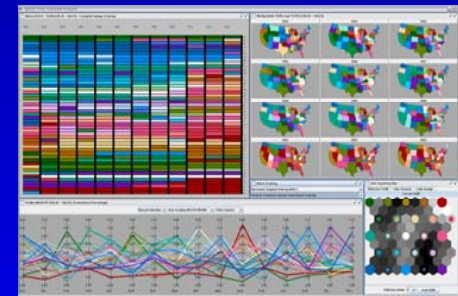
- Each corner of the model represents a *perspective*
- Each perspective has its own *properties*

# Space-Time Nexus

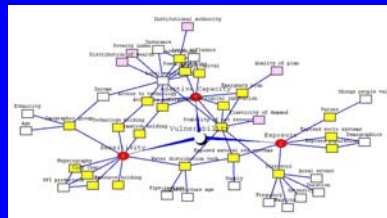
- supporting an iterative, extended *process* of analysis
- With integration of visual and computational tools



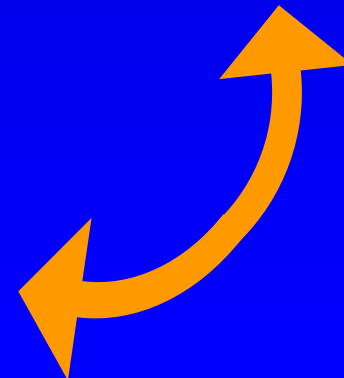
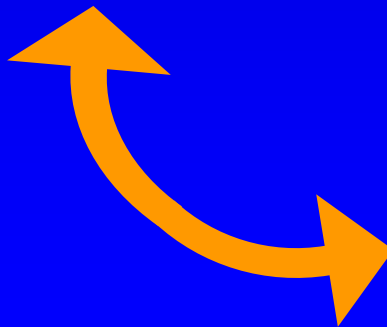
database environment



Visualization environment



Concept graph



### Hotels

Name	Visits
Rebersburg, PA	
Roaring Spring, PA	

### Parameters (Reruns)

Cycle Length:  Cell Size:  Options:

Count Guests  Outline Dates

Fill Seasons  Outline Months

### Parameters (Map)

City Scale:  Options:

Latitudes  Longitudes  Counties  County Labels

### Guests

Name	Visits
sheats, a-m	
sheats, r-a	
stonebraker, j-m	
hess, e-k	
welshans, h-w	
stover, thos-n	
klinefelder, john-?	
orwig, c-h	
nearhood, harry-o	

Filter D...  Filter Residen...

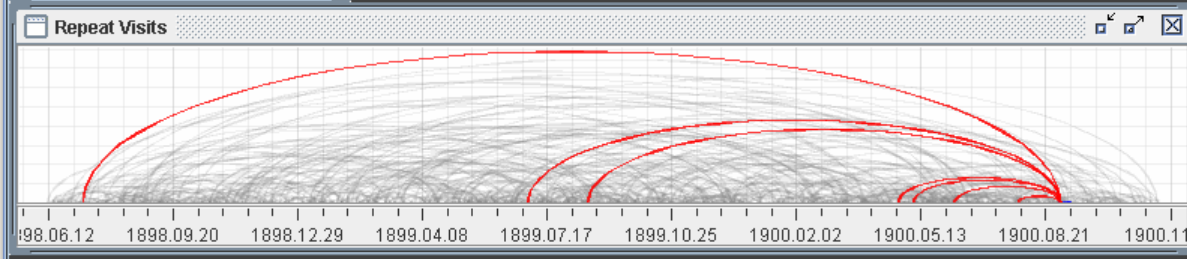
### Reruns

(None)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
1900.03.04 - 1900.03.17		2		4	3	3			10		5	3	3	2	35
1900.03.18 - 1900.03.31		1		1		2	1		8	7	3	4	2	5	34
1900.04.01 - 1900.04.14	3	1	5	3	3	3	4	2	5	5		3	2	3	42
1900.04.15 - 1900.04.28		3		7	2	2			3	3	6	8	4		38
1900.04.29 - 1900.05.12	1	2	7	8	7	3	2	1	5	5	3	6	6	2	58
1900.05.13 - 1900.05.26		1	6	5	3	3	8	2	5	1	5	3	4	2	58
1900.05.27 - 1900.06.09		2	2	2	3	4	1		6	4	2	3	3	6	41
1900.06.10 - 1900.06.23		3	5	3	1	6			1	7	4	4	5	2	64
1900.06.24 - 1900.07.07	1	3	4	2	6	10	7		3	2		1	3	22	33
1900.07.08 - 1900.07.21		2	5	4	2	1	2		1	9		4	3		39
1900.07.22 - 1900.08.04		5		2	1	1	6		10	6		5	1	2	32
1900.08.05 - 1900.08.18		7	1	5		2	1		1	3	2	6	4		30
1900.08.19 - 1900.09.01		3			2	3	3		4	4	2	1	5	3	80
1900.09.02 - 1900.09.15	42	2	2	5		6	9	4	3	1		3	3		37
1900.09.16 - 1900.09.29	7	1	1	1	4	2	1		4		4	3	8	1	22
1900.09.30 - 1900.10.13		4	1	2	6	3			2			1	1		35
1900.10.14 - 1900.10.27		2	2	1	4		6		4	2	7	4	1	2	22
1900.10.28 - 1900.11.10		2	3		4	2	5			3			3		22
1900.11.11 - 1900.11.24				4					6	4					16

Filter Guests  Filter Residences

### Map

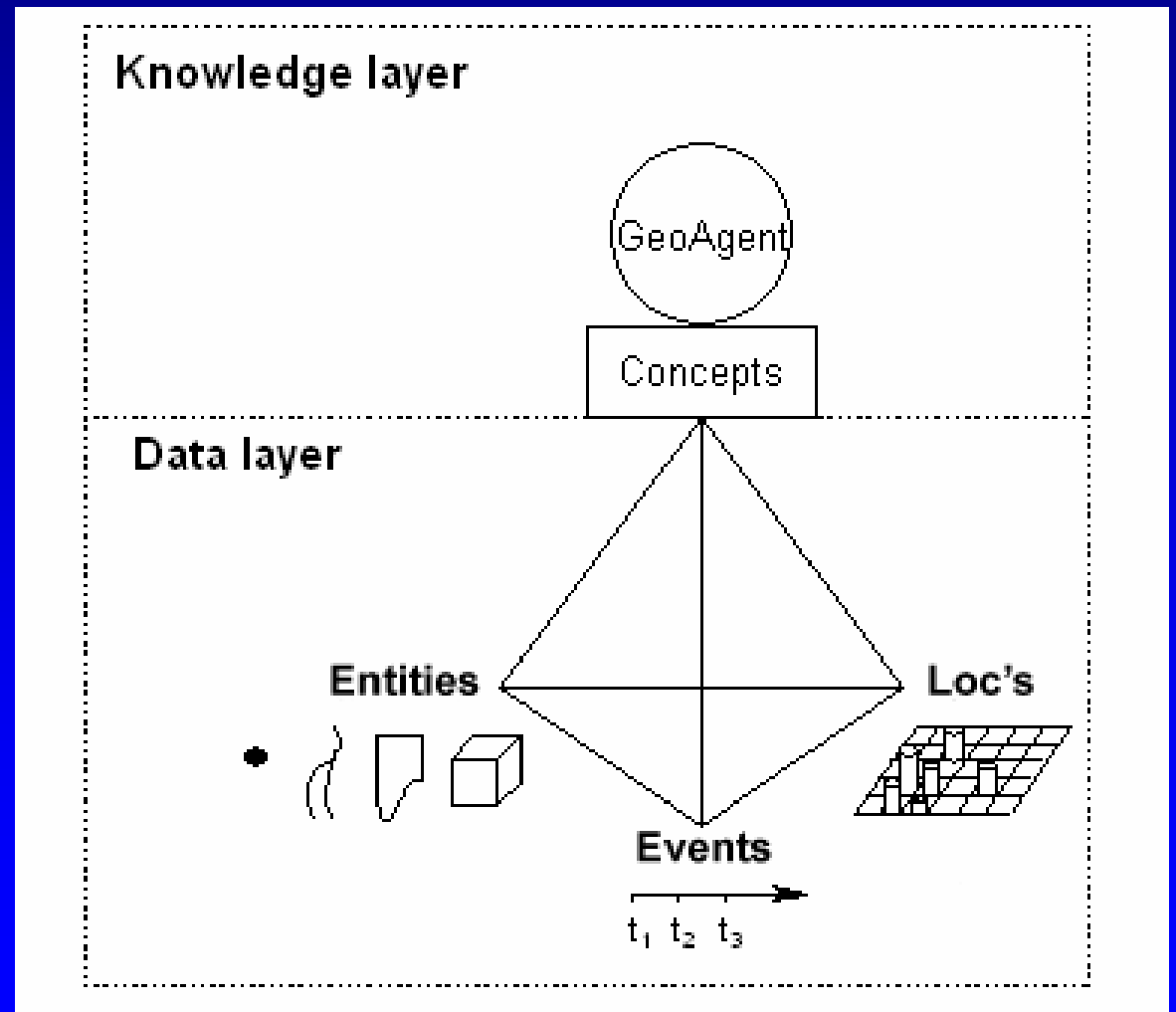
Filter Dates  Filter Guests  Filter Residences

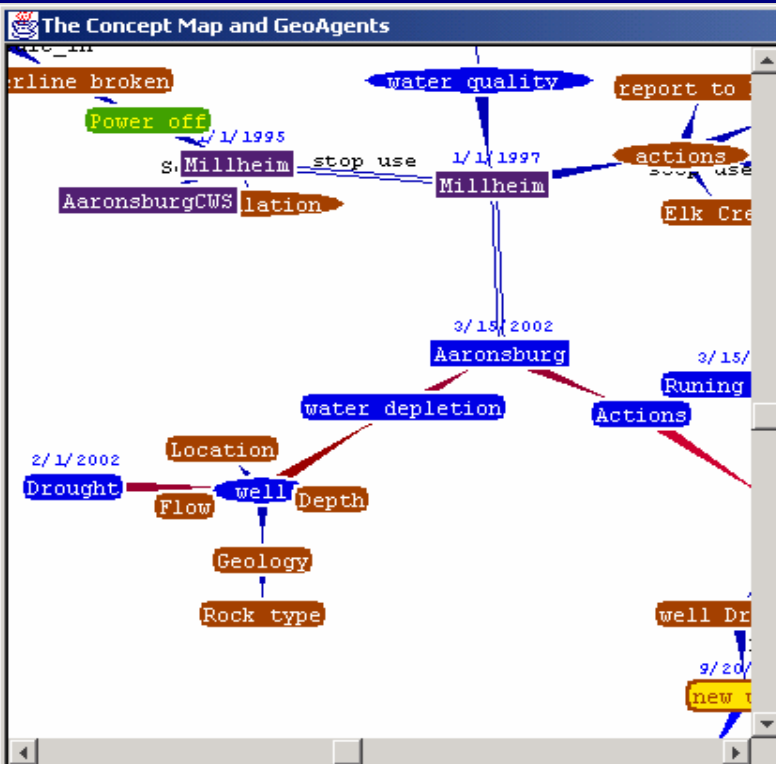


### Visits

Date	Hotel	Name	Residence
1900.09.02 (Sun)	Rebersburg, PA	rishel, ?-?	Spring Mills, PA
1900.09.02 (Sun)	Rebersburg, PA	weaver, l-l	Woodward, PA
1900.09.02 (Sun)	Rebersburg, PA	sheetz, c-r	Zion, PA
1900.09.02 (Sun)	Rebersburg, PA	stover, a-?	Zion, PA
1900.09.02 (Sun)	Rebersburg, PA	sillida, h-p	?, ?
1900.09.02 (Sun)	Rebersburg, PA	crowfert, h-?	?, ?
1900.09.02 (Sun)	Rebersburg, PA	figels, lewis-?	?, ?
1900.09.02 (Sun)	Rebersburg, PA	homan, a-b	Freeport, IL

# On beyond just data





### JessAgent-2

I am UK ! ...  
 >> sending message : message to mka:Je  
 << receiving message of type : madkit.  
 I am OK ! ...

CWS  
 subwtsh

### Edit : C:\yu\GeoAgents\GeoAgents\St...

```
File Edit Actions Options

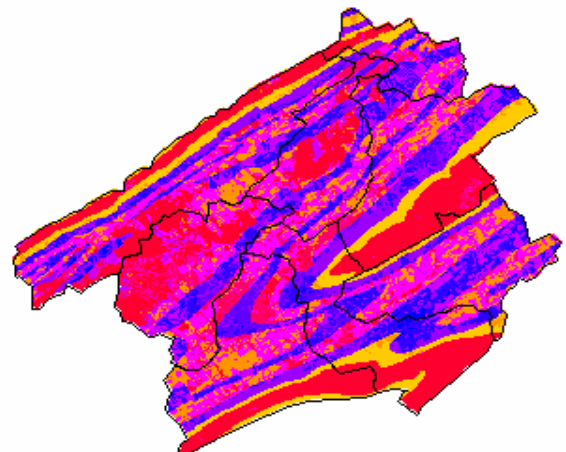
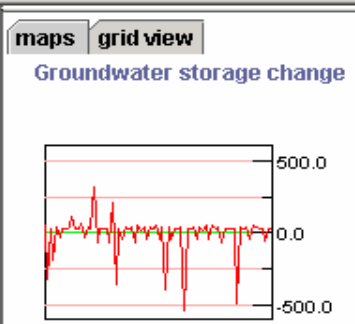
;; CWS.

(defrule startup ""
=>
  (printout t "I am StateColl
  (if (isGroup "CWS_Centre")
    then
      (println "Yeah ! I a
  else
      (println "Nope ! I c
  (createGroup TRUE "CWS_Centr
  (requestRole "CWS_Centre" "C
  (assert (lookingForPartner))
  (assert (nth 25)) ;;
)
```

Objects Fields Time

GroundwaterStorageChanges  
 Sub-watersheds

Current Time: 8/20/2003



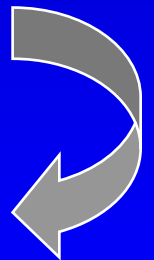
# Summary...

- Time is fundamental, and cannot be added-on

- On beyond just data

data models + process models

= KNOWLEDGE



- Analysis vs. Story-telling tools



- Representing process

Derived  
information

+

Observational data

