







• A resource is logical information. A resource is not the physical representation.

Example

- Resource: "The story of Goldilocks and the Three Bears"
- Valid representations:
 - Ladybird hardback book
 - $\,\circ\,$ Word of mouth
 - Supermarket kids paperback book
 - eBook
 - HTML webpage
 - Disney movie
- Same resource multiple representations.
- In the age of resource oriented APIs our challenge: what makes a good representation?

What Porridge do we like?

- Too hot
- Too cold
- Too sweet
- Too salty
- Too creamy
- Not creamy enough
- Too lumpy
- ...
- How can we judge when a representation is just right?
- We could just "hack the porridge"
- Or we could think about it...



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t=0, $R = f(x)^{Composable}$

Time goes on and things change:

 $t \rightarrow t'$, $x \rightarrow x'$

To adapt to change we could recode

$$f \rightarrow f'$$
, $R = f'(x')$

very brittle and very expensive

Much better to choose a representation for x such that:

R = f(x')

Or at the least :

$$R' = f(x')$$
where R C R'

Choices of Representation Model

• There is no one true form of representation (remember Goldilocks)

• Optimal engineering balance with composable representations

Representation	✓ Composable R' = f(x')	Domain Example
Atom	🗙 Too small	Assembly Language
Linear Array	X Insert / Append / Prepend	LISP
N-Dimensional Array	¥ Insert / Append / Prepend	MATLAB
MAP	≭ Key collisions	Javascript Object Notation *
Graph	✓ ★ Requires State to Process	RDF , Theseus

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* This is why JSON sucks

JSON = hybrid of Map & Array

2 ways in which change causes $f \to f'$







• There's a resource for that... active:moduleStats (http://localhost:1060/tools /scriptplaypen)

Does anything else do this?

- Is there another highy complex computational system that has the same engineering requirements?
- Constant change imperative not to recode?
- Chomsky Syntactic Structures (https://en.w 1957
- Linguistic Branching



- Every human language conforms to the Universal Grammar.
 - Every sentence
 - Every word
 - Is a tree structure
- Most everything you ever said or were told
 - Was a tree structure!





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