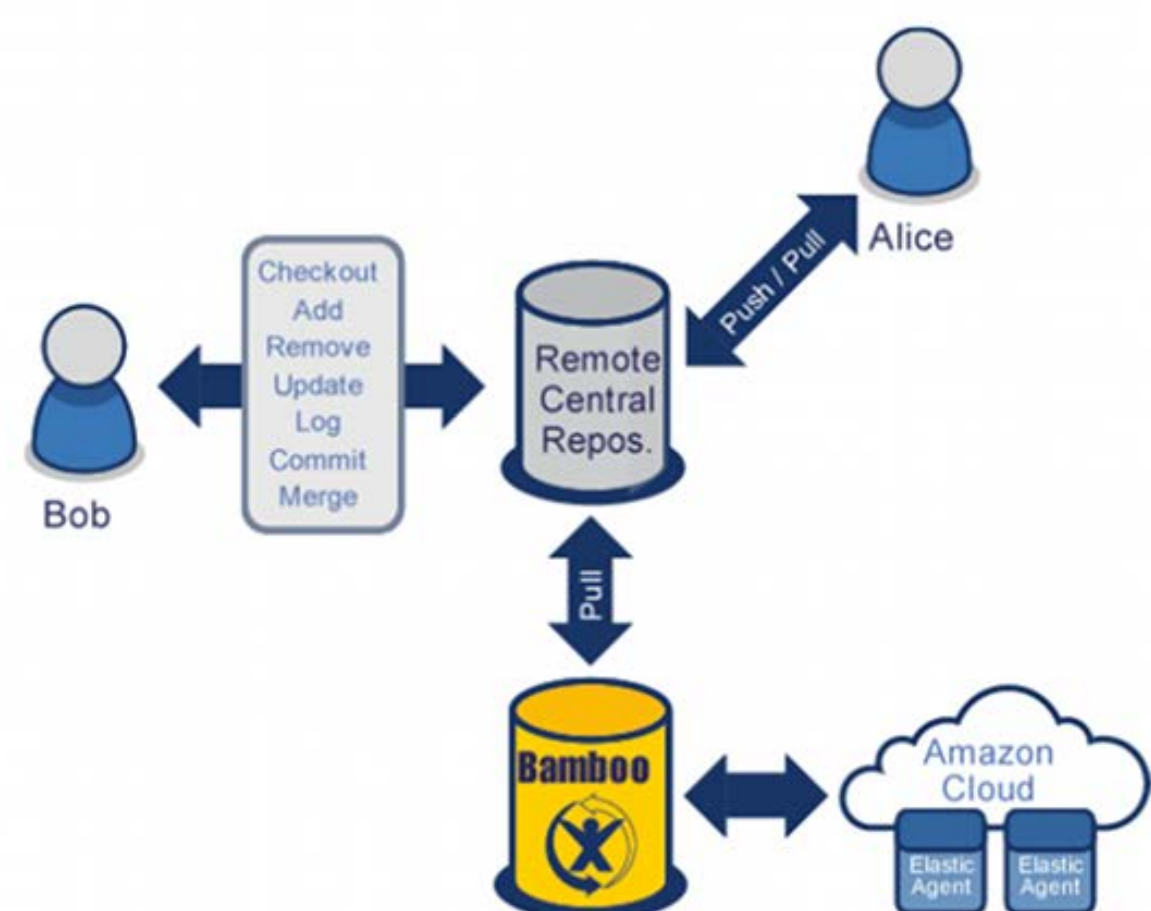


Technology Trends with the Potential to Change Clinical Development

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MANAGING OUR CODE



What is Source Control?

the management of changes to documents, computer programs, large web sites, and other collections of information.

Current World?

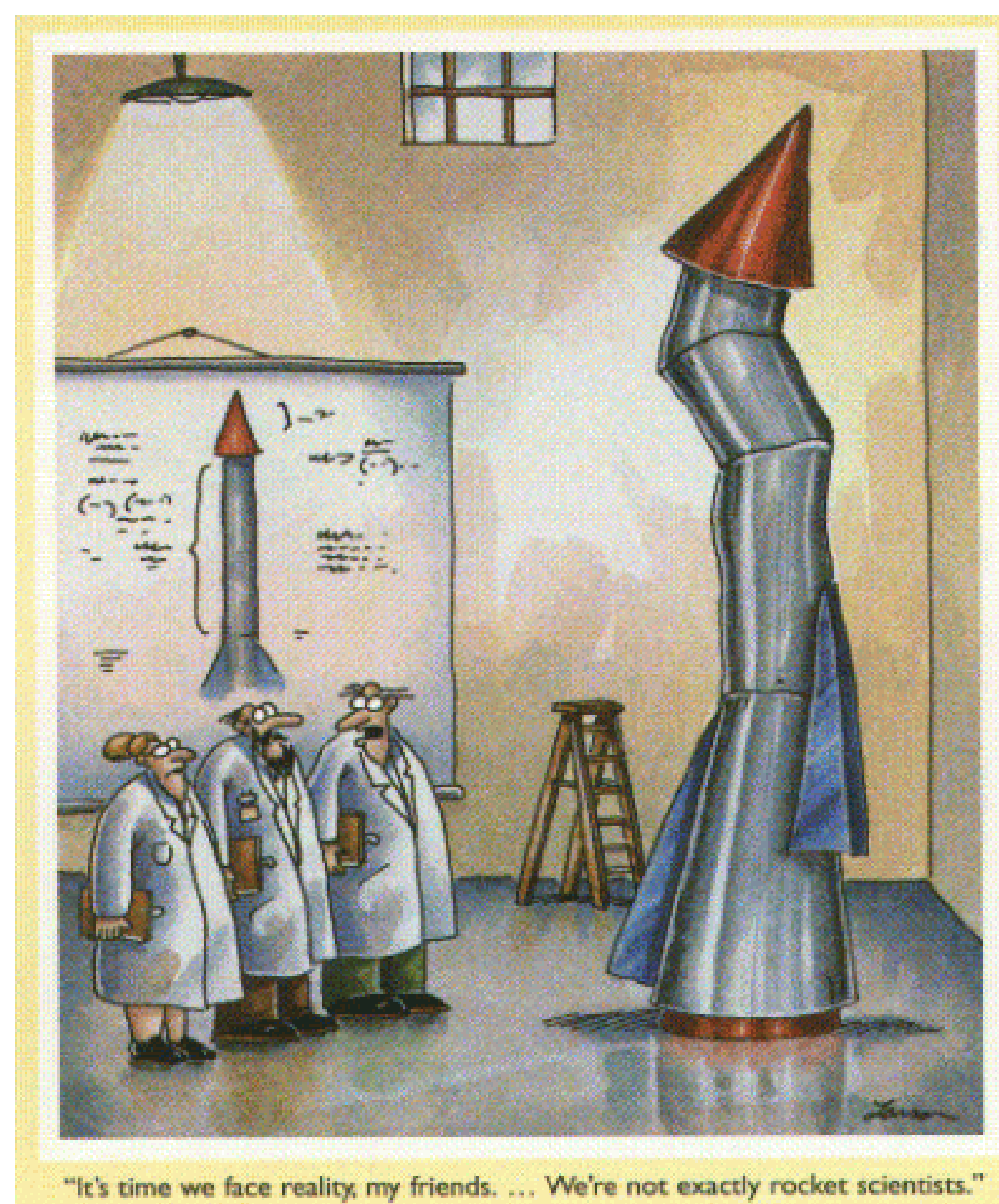
- Copy, Paste, Copy, Paste
- Delivery = New folders
- No versioning, No compare

Potential to Change

- Manage lifecycle of code
- One source of the truth
- Know your changes
- Automate current manual processes

	COMMENT	DATE
○	CREATED MAIN LOOP & TIMING CONTROL	14 HOURS AGO
○	ENABLED CONFIG FILE PARSING	9 HOURS AGO
○	MISC BUGFIXES	5 HOURS AGO
○	CODE ADDITIONS/EDITS	4 HOURS AGO
○	MORE CODE	4 HOURS AGO
○	HERE HAVE CODE	4 HOURS AGO
○	AAAAAAA	3 HOURS AGO
○	ADKFJSLKDFJSDKLFJ	3 HOURS AGO
○	MY HANDS ARE TYPING WORDS	2 HOURS AGO
○	HAAAAAAAANDS	2 HOURS AGO

AS A PROJECT DRAGS ON, MY GIT COMMIT MESSAGES GET LESS AND LESS INFORMATIVE.



SEMANTICS

What is Semantic Data?

A method of organizing data that reflects the basic meaning of data items and the relationships among them making it easier to develop application programs and to maintain the consistency of data when it is updated.

- About Data, not the web
- Highly descriptive data and relations between said data: linked data
- Results with meaning
- Based on Triples: Subject Predicate Object
- Can describe any relationship, literally
- See OWL, RDF, Turtle, Apache Jena, and Ontologies

OPEN SOURCE ANALYSIS

Software or code that is available for modification or enhancement by anyone and is 'free'.

Open Source free! Cost to deploy, enhance, and make work

Example:

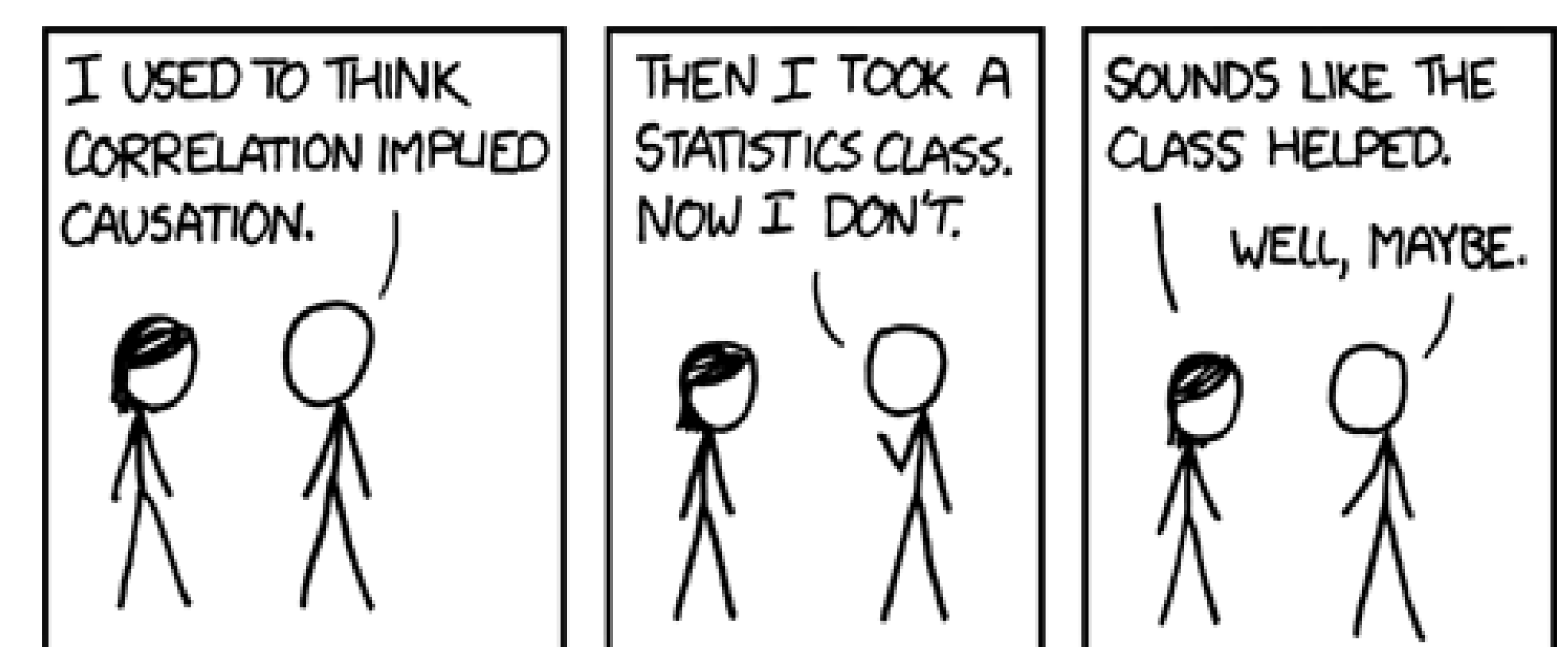
SAS

- Standard clinical model: SAS®, Data Sets, and Reporting
- Data processing, easy to use reporting
- Tried and True. Clinical default for decades
- Expensive
- Overused at times

R

- Open Source
- Robust user community
- Plethora of 3rd party plugins
- Exceptional graphics, weaker page reporting
- More modern syntax
- Shiny – web application framework for R
- Free!

```
dens <- density(data,
dx <- dens$x
dy <- dens$y
if(add == TRUE)
plot(0., 0., axes = F, main
ylab = "")
if(orientation == "paysage")
dx2 <- (dx - min(dx))/
```



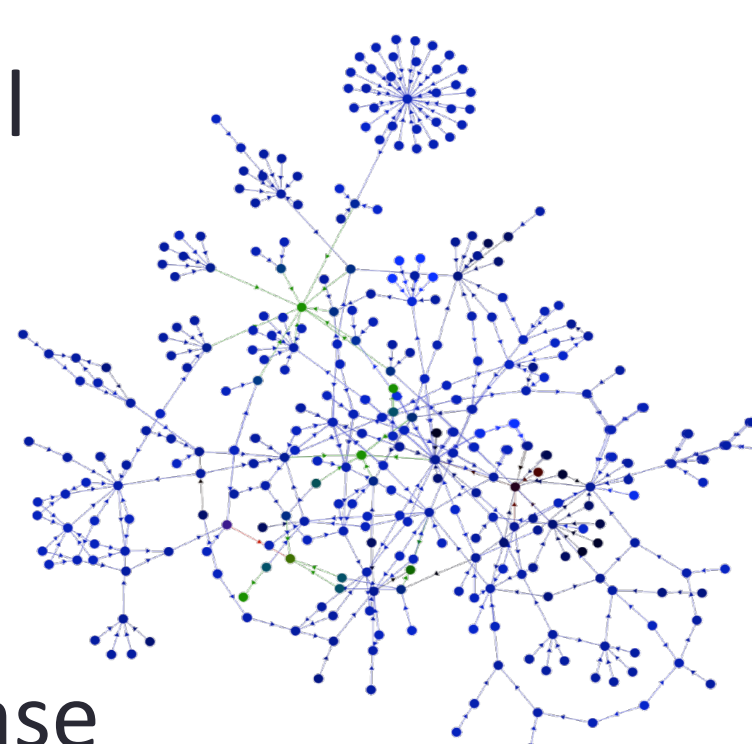
UNSTRUCTURED

Unstructured Data?

refers to information that either does not have a **pre-defined data model** or is not organized in a pre-defined manner. Schema-less, can enhance without re-architecting

- Either Key / Value based, Document bases, or Triple based
- Attributes and values can enhance and travel with the data
- Great Potential for traceability
- Rendering decoupled from model
- Highly scalable systems, redundant, extensible, and flexible
- Developed for non-traditional table models and Big Data
- Can be leveraged by creative types ☺
- See Cassandra, HBase, Riak, Mongo, DynamoDB, CouchBase

DATA...



PAAS

What is PaaS (Platform as a Service)?

is a category of cloud computing services that provides a computing platform and a solution stack as a service where the consumer creates an application or service using tools and/or libraries from the provider and controls software deployment and configuration settings.

- Extends the concept of IaaS (Infrastructure as a Service) SaaS (Software as a Service)
- Application Development components available as pluggable pieces
- Ability to scale (and decrease capacity) automatically based on usage. Elastic.
- Changing how software is developed and deployed. Could change how clinical systems are built and used
- Potential: Pre-Validated Systems and Applications, saving countless hours and dollars
- See Apache Stratos, RedHat OpenShift, Apprenda