



Services Sciences

research, education or just integration?

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A starting point

- Is there any such thing as a 'science of services'?
- If it does exist, what is it, how does it operate and how does it progress?
- If it does not exist, should it and if so why?

Definitions, definitions, def...

science

Noun

The intellectual and practical activity encompassing the systematic study of the structure and behaviour of the physical and natural world through observation and experiment

- A particular area of this
- A systematically organised body of knowledge on a particular subject

Origins: Middle English (denoting knowledge): from Old French, from Latin *scientia*, from *scire* 'know'

Reasons for wishing a 'science' (or sciences) of services into being



- This set of activities we label *services* needs to have the scruff of it's neck identified (so it can be hauled up good and proper)
- It appears clear that no one contribution – mathematics, economics, psychology, ethnology – to name but a few – holds the key to the successful creation, management and evolution of complex services

The elephant in the room

John Godfrey Saxe's (1816-1887) version of the famous Indian legend,

It was six men of Indostan,
To learning much inclined,
Who went to see the Elephant
(Though all of them were blind),
That each by observation
Might satisfy his mind.

The *First* approach'd the Elephant,
And happening to fall
Against his broad and sturdy side,
At once began to bawl:
"God bless me! but the Elephant
Is very like a wall!"

The *Second*, feeling of the tusk,
Cried, -"Ho! what have we here
So very round and smooth and sharp?
To me 'tis mighty clear,
This wonder of an Elephant
Is very like a spear!"

The *Third* approach'd the animal,
And happening to take
The squirming trunk within his hands,
Thus boldly up and spake:
"I see," -quoth he- "the Elephant
Is very like a snake!"

The *Fourth* reached out an eager hand,
And felt about the knee:
"What most this wondrous beast is like
Is mighty plain," -quoth he,-
"'Tis clear enough the Elephant
Is very like a tree!"

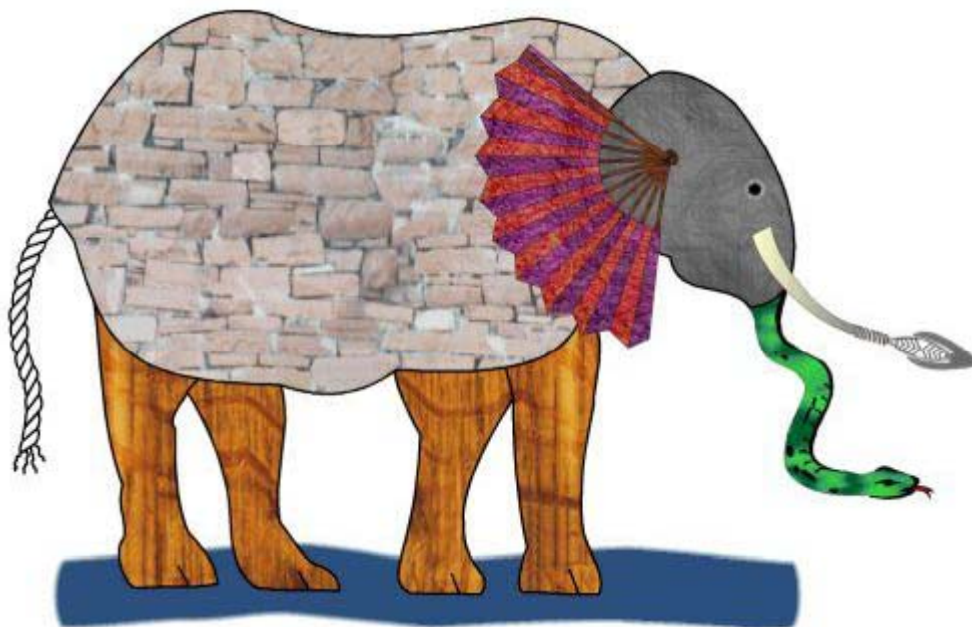
The *Fifth*, who chanced to touch the ear,
Said- "E'en the blindest man
Can tell what this resembles most-
Deny the fact who can,
This marvel of an Elephant
Is very like a fan!"

The *Sixth* no sooner had begun
About the beast to grope,
Then, seizing on the swinging tail
That fell within his scope,
"I see," -quoth he,- "the Elephant
Is very like a rope!"

And so these men of Indostan
Disputed loud and long,
Each in his own opinion
Exceeding stiff and strong,
Though each was partly in the rig
And all were in the wrong!

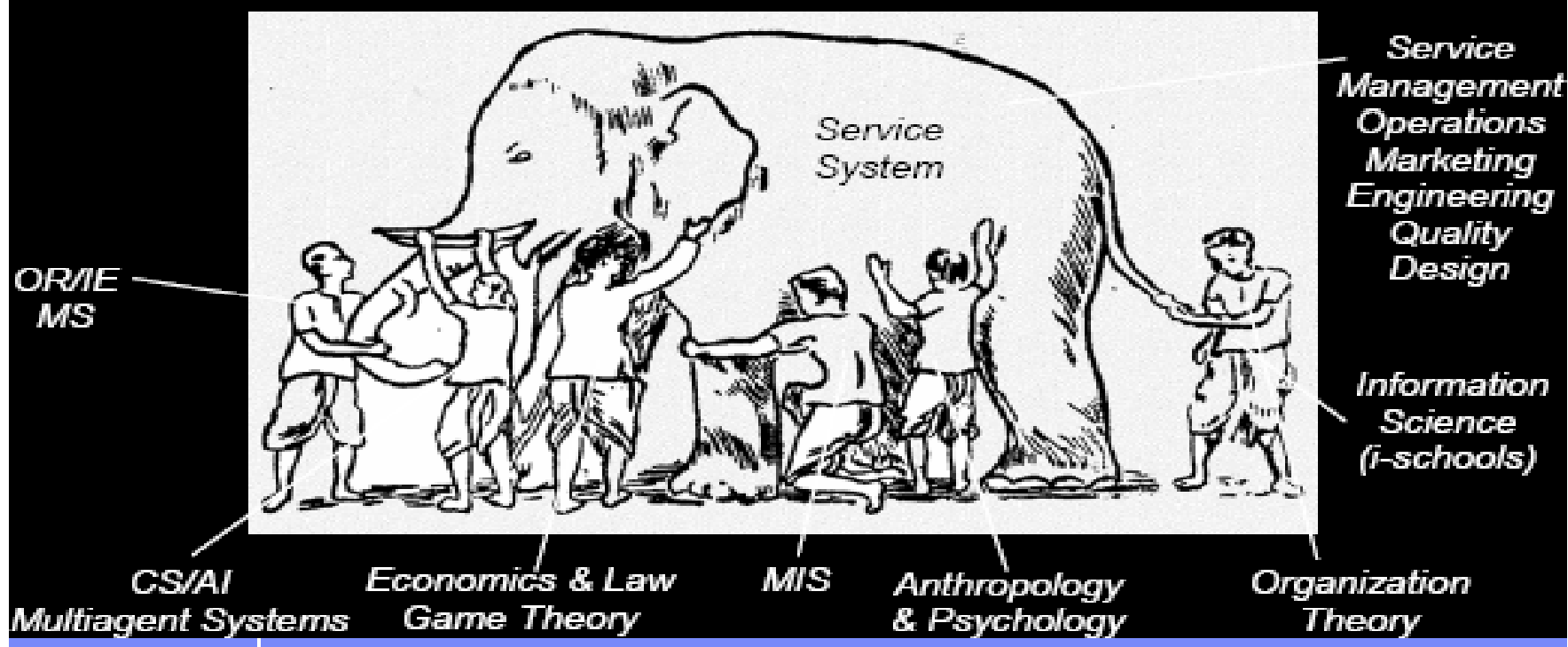
MORAL,

-So, oft in theologic wars
The disputants, I ween,
Rail on in utter ignorance
Of what each other mean;
*And prate about an Elephant
Not one of them has seen!*



Jim's Elephant

"Service science is just _____"
Need to unbundle and rebundle knowledge from existing disciplines



But we have been here before - why Computer Science?



- Not a 'subject' at all until the 1960s (Purdue 1962?)
- Still much disagreement as to what makes up a 'computer science education' but it would probably include some of
 - Mathematics (discrete and continuous)
 - Psychology
 - Electronic Engineering
 - Project Management
 - Programming
 - Systems Analysis
 - and on and on and...
- The majority of fundamental advances in the area of CS have come from specialists – as above – not 'well rounded, trained CS graduates' – who have contributed as integrators

But is this 'confusion' a bad thing?

- It hasn't done the 'subject' any harm
 - Economic activity
 - Student numbers
 - Research and innovation awards
- Why should this be?
 - Frameworks that enable individuals with very different vocabularies to communicate and cooperate have been developed
 - Some coherence of objectives has been achieved

So could 'Services Science' replicate the best of CS?



- Yes
 - It could obviously operate on a similar model to the growth and maturation of computer science
 - It could learn from the experiences of the CS community and avoid some of the worst behaviours we have experienced over the last 50 years
 - We need to – the viability of the world economy depends on getting this right
- No
 - It is far more complex than CS has ever, even in the worst excesses of the subject area
 - Far more of SSME is reliant on the 'natural' or 'discovered' world than CS – which is largely constructed

How might SSME organise in the same way as CS?

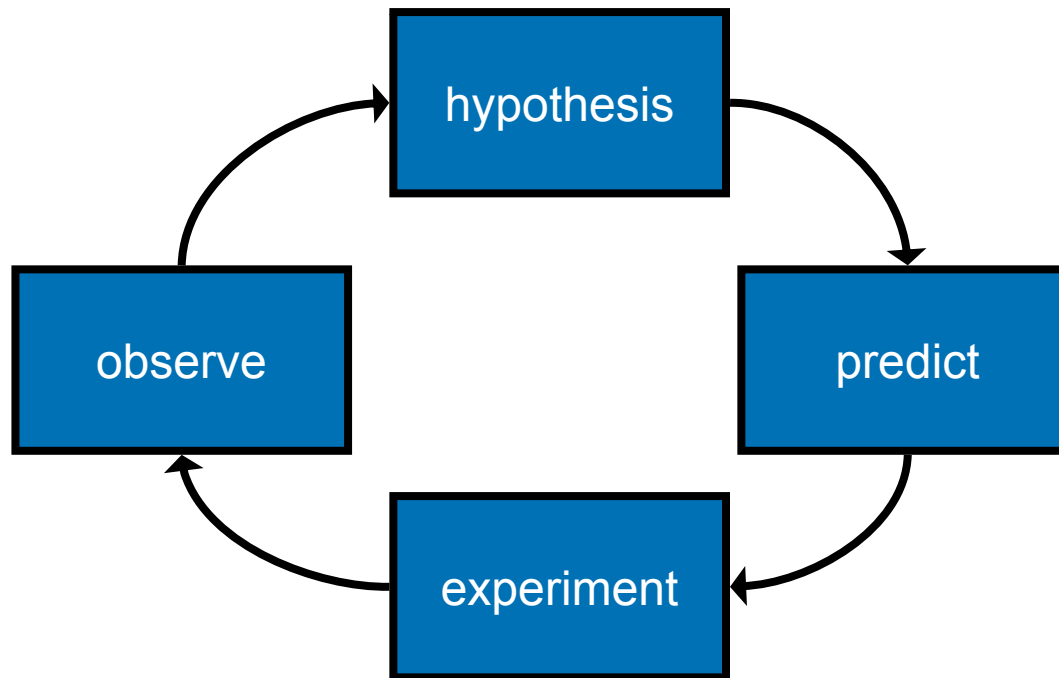


- Recognise that while an amalgam of ‘sciences’, a common organising principle can be identified and exploited
- Understand that science underpins engineering which in it’s turn supports application – and all the while, mathematics provides a means of enforcing some continuum between layers
- Do Science

What do we mean by 'doing Science'?



- Based upon gathering observable, empirical and measurable evidence, the collection of data through observation and experiment, and the formulation and testing of hypotheses

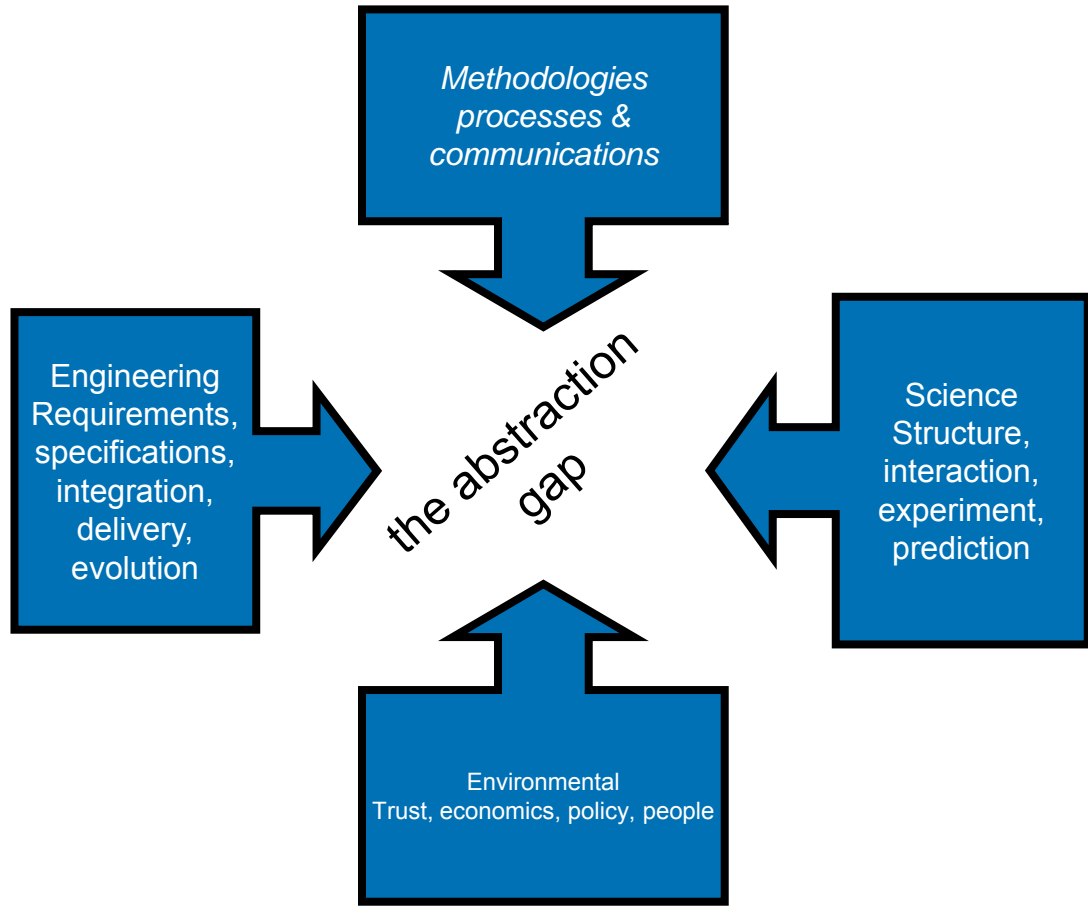


Why is this important?

- Many of the subjects that might be considered core to an understanding of services do not have traditionally strong ‘science’ rationales
 - Either ‘real scientists’ have considered such work below them OR
 - ‘new scientists’ have considered such science‡ below them – take your pick
- Something has to provide a means of very diverse communities discussing areas of mutual and overlapping interest without bar fights breaking out

‡ it is with some sorrow I have to observe the introduction of an ‘accredited’ Bachelors of Science degree in homeopathy has been introduced by a UK University

To the specific – what are we trying to fix here? – an abstraction gap



So where should NSF (and similar funding bodies) go?



- Take CS as a model (albeit flawed) of how to do integrative systems and education, albeit on a limited scale
- Encourage cross disciplinary work – if necessary through the establishment of a discipline with it's own faculties – if cultural and organisational difficulties persist
- Recognise that services are the most complex artefacts that humans have every built – and we will come to rely on them more and more for our economies and our societies – they need to be understood.

A little light reading for anyone not too irritated by now (all hyperlinked)



- [Public services innovation through technology](#) (a discussion of some of the issues facing public services and the challenges of identifying and applying appropriate technologies)
- [Engineering the Polymath Innovation in Systems and Services Education](#) (a position paper for a previous NSF workshop on education)
- [UK Services Innovation Network](#) (a discussion of the increasingly important role of complex networked services and routes forward for research and development)
- [Grand Challenges for Systems and Services Sciences](#) (a modest suggestion for a unifying Grand Challenge in services science)

Spare Ellyphant



Jim's T

Service scientists are both broad and deep – T-shaped.



"Need I-shaped, T-shaped, π -shaped people..." – Stuart Feldman (Oct. 6, 2006)

Crossing the T http://en.wikipedia.org/wiki/Cross_the_T

Crossing the T or **Capping the T** is a tactic in naval warfare, in which a line of warships crosses in front of a line of enemy ships, allowing them to bring all their guns to bear while receiving fire from only the forward guns of the enemy. It became possible in the late nineteenth and early twentieth centuries with the advent of steam-powered battleships with rotating gun turrets, which were able to move faster and turn quicker than sailing ships. The tactic became obsolete when missiles and aircraft allowed long-range strikes.