


UTS: IICT where information and communication meet research

IICT

UTS:  
INSTITUTE for INFORMATION & COMMUNICATION TECHNOLOGIES





# The ABACUS Architectural Approach to Software, System and Enterprise Evolution

by Dr Tim O'Neill


University of Technology, Sydney (UTS) and Avolution Pty Ltd

Architecture-Based Analysis of Complex Systems (ABACUS)

IICT


UTS:  
INSTITUTE for INFORMATION & COMMUNICATION TECHNOLOGIES




## The Need

- In managing complex environments some questions are so tough they **rarely get answers** ...
  - Should I upgrade my system infrastructure? What's it going to **cost**? What's the **benefit**?
  - How do I cut **30% off** my OpEx? Should I retire the legacy system or rationalise my head-count?
  - What's the **impact** of the M&A we're about to undertake?
  - What Disaster Recovery (DR) plan should I adopt? ...
- Currently all these **questions** are approached with:
  - **High-risk** experiments
  - **Questionable** and **subjective** vendor and consultant advice
  - Procrastination
  - Resignation to living with the problem ("**do nothing**")

The ABACUS Architectural Approach to Computer-Based System and Enterprise Evolution



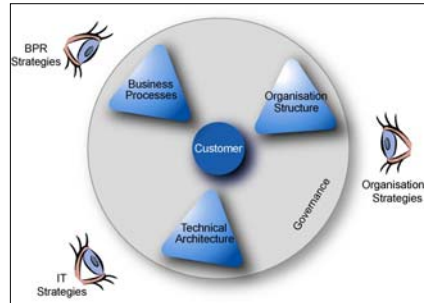
SATURN05 Pittsburgh, PA, USA. 6<sup>th</sup>-7<sup>th</sup> April 2005





## The nature of Enterprise Architecture

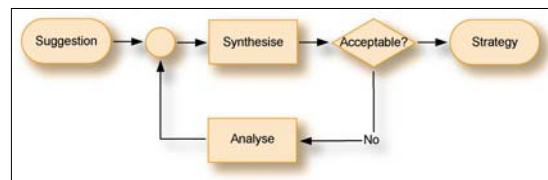
- Enterprise Architecture (EA) can be defined as:  
*The system of **applications**, **infrastructure**, and **information** that support the **business functions** of an **organisation**, as well as the processes and standards that dictate and guide their evolution*
- EA is a trinity of **People**, **Process** and **Technology**, all interrelated, and focussed about the **Customer**:



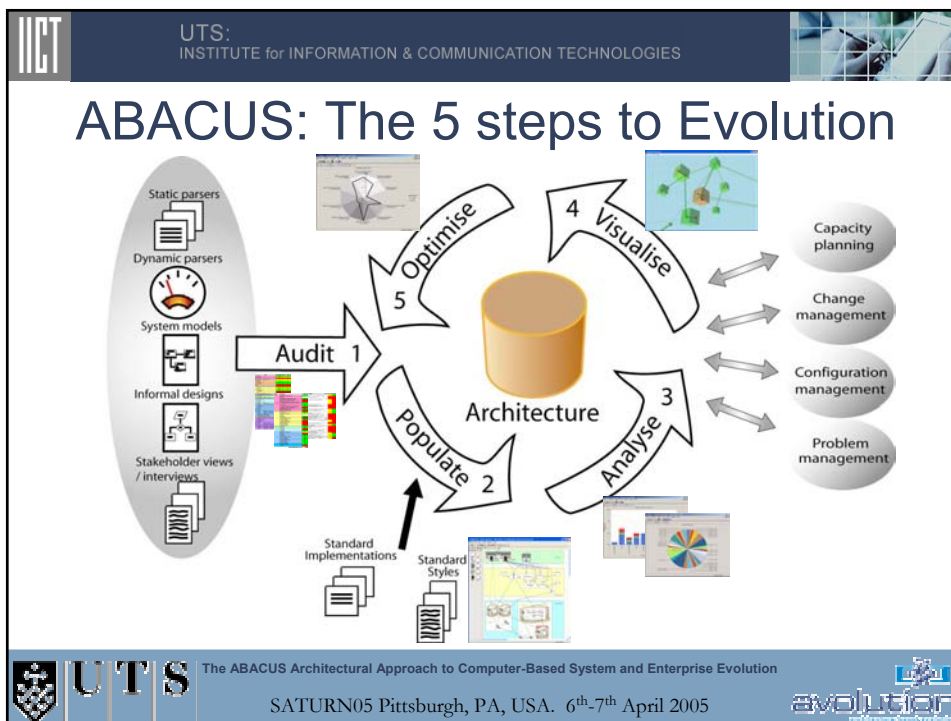
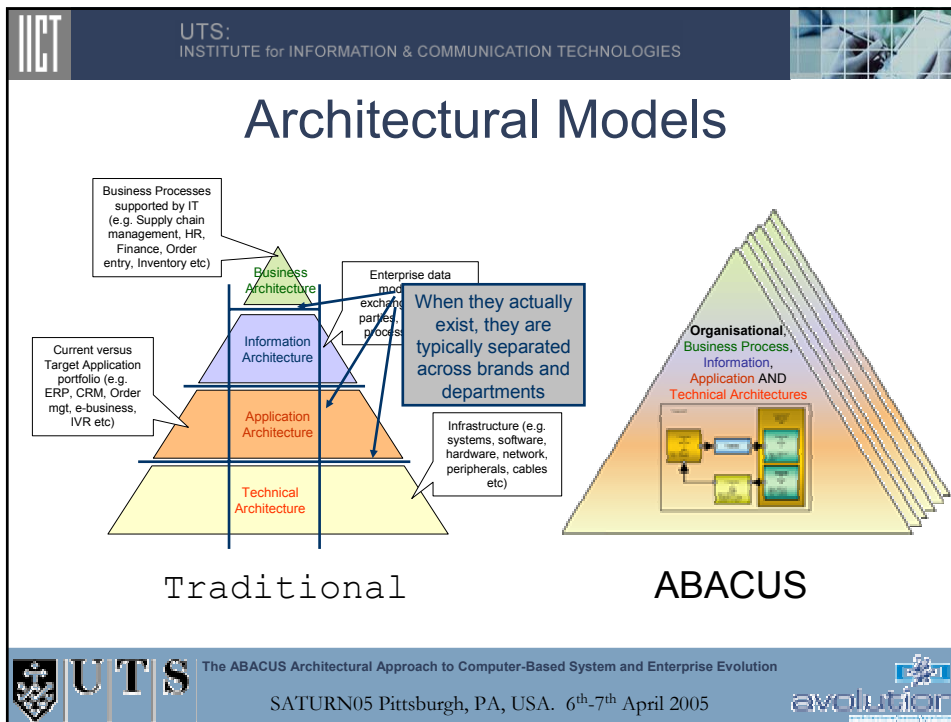
## EA and Strategy

- EA Strategy can be defined as:  
*The practice of **foreseeing** the **architectures** most capable of **satisfying** the evolving business capabilities, and **identifying** and **implementing** procedures to ensure they are realised*

Suggest  
Synthesise  
Analyse  
Accept  
Implement



- Enterprises need a methodology and toolset to **develop**, **trial** and **justify** strategies





## 1) Audit using an EA Maturity Model

- To assess the quality, quantity and completeness of **information** and **processes**

Type	Feature	Value
Model	Number of Diagrams	100
Model	Formal	100
Model	Centralized collaborative model	100
Model	Horizontal architectural model	100
Model	Multiple versions (e.g. "sandbox")	100
Model	Customizable types, implementations and structures	100
Model	Customizable metrics and properties	100
Model	Available to 100's of elements	100
Model	Integrated information	100
Model	Multi-layer / Hierarchical	100
2D	Number of Diagrams	100
2D	Formal	100
2D	Horizontal	100
2D	Linked to Repository	100
2D	Color by Type	100
2D	Color by Property	100
2D	Shape by Type	100
2D	Size by Property	100
Reports	Standard	100
Reports	Custom	100
Charts	Standard	100
Charts	Custom	100
3D	Number of Diagrams	100
3D	Formal	100
3D	Horizontal	100
3D	Linked to Repository	100
3D	Color by Type	100
3D	Color by Property	100
3D	Shape by Type	100
3D	Size by Property	100
3D	Available to 100's	100
3D	Formal	100

Type	Feature	Value
Model	Number of Diagrams	100
Model	Formal	100
Model	Centralized collaborative model	100
Model	Horizontal architectural model	100
Model	Multiple versions (e.g. "sandbox")	100
Model	Customizable types, implementations and structures	100
Model	Customizable metrics and properties	100
Model	Available to 100's of elements	100
Model	Integrated information	100
Model	Multi-layer / Hierarchical	100
2D	Number of Diagrams	100
2D	Formal	100
2D	Horizontal	100
2D	Linked to Repository	100
2D	Color by Type	100
2D	Color by Property	100
2D	Shape by Type	100
2D	Size by Property	100
Reports	Standard	100
Reports	Custom	100
Charts	Standard	100
Charts	Custom	100
3D	Number of Diagrams	100
3D	Formal	100
3D	Horizontal	100
3D	Linked to Repository	100
3D	Color by Type	100
3D	Color by Property	100
3D	Shape by Type	100
3D	Size by Property	100
3D	Available to 100's	100
3D	Formal	100

Type	Feature	Value
Model	Number of Diagrams	100
Model	Formal	100
Model	Centralized collaborative model	100
Model	Horizontal architectural model	100
Model	Multiple versions (e.g. "sandbox")	100
Model	Customizable types, implementations and structures	100
Model	Customizable metrics and properties	100
Model	Available to 100's of elements	100
Model	Integrated information	100
Model	Multi-layer / Hierarchical	100
2D	Number of Diagrams	100
2D	Formal	100
2D	Horizontal	100
2D	Linked to Repository	100
2D	Color by Type	100
2D	Color by Property	100
2D	Shape by Type	100
2D	Size by Property	100
Reports	Standard	100
Reports	Custom	100
Charts	Standard	100
Charts	Custom	100
3D	Number of Diagrams	100
3D	Formal	100
3D	Horizontal	100
3D	Linked to Repository	100
3D	Color by Type	100
3D	Color by Property	100
3D	Shape by Type	100
3D	Size by Property	100
3D	Available to 100's	100
3D	Formal	100

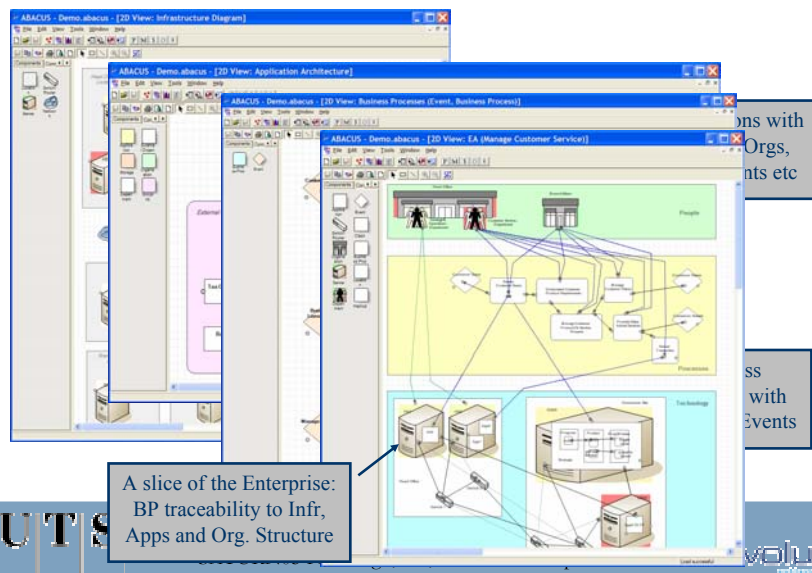


The ABACUS Architectural Approach to Computer-Based System and Enterprise Evolution

SATURN05 Pittsburgh, PA, USA. 6<sup>th</sup>-7<sup>th</sup> April 2005



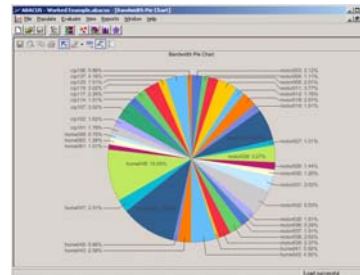
## 2) Populate a central repository with good ol' 2D





### 3) Use metrics to analyse the architecture

- ATAM, IEEE 1061 and ISO 9126 for guidance
- There's > 76 qualities/metrics to consider!
- 3 "types"; Equational, Structural, Simulation



The ABACUS Architectural Approach to Computer-Based System and Enterprise Evolution

SATURN05 Pittsburgh, PA, USA. 6<sup>th</sup>-7<sup>th</sup> April 2005



### 4) Visualise the results with some amazing 7D art



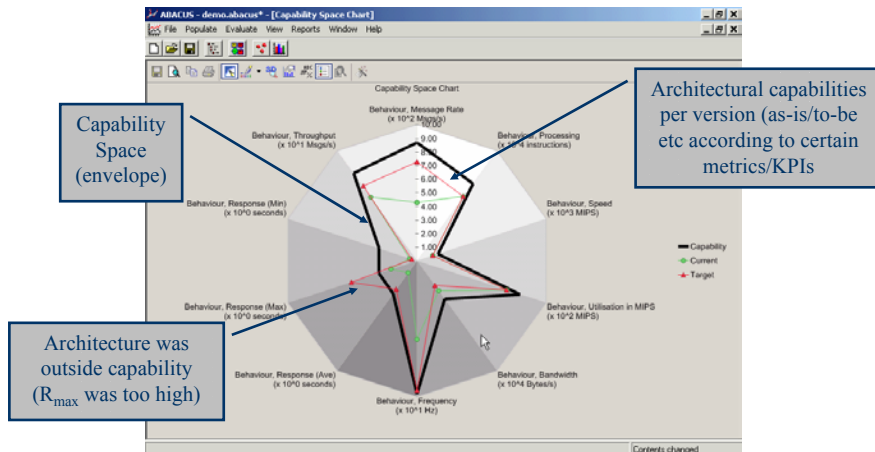
The ABACUS Architectural Approach to Computer-Based System and Enterprise Evolution

SATURN05 Pittsburgh, PA, USA. 6<sup>th</sup>-7<sup>th</sup> April 2005





## 5) Repeat steps 2, 3 & 4 to optimise to a desired “to-be” from the “as-is”



## Conclusion

- Provides **revolutionary views** of the enterprise
  - To help IT and business units communicate about complex socio-technical issues in a single united model
  - Customisable depending on role, function and purpose
- Allows in-house **architectural analysis** and **comparison**
  - By extracting a broad range of Architectural Metrics
  - To design the best implementation for Strategic Change
  - That is Low Cost and Quantitative
- Controls architectural **strategy** top-down
  - Synthesise and evaluate strategies according to your own KPIs



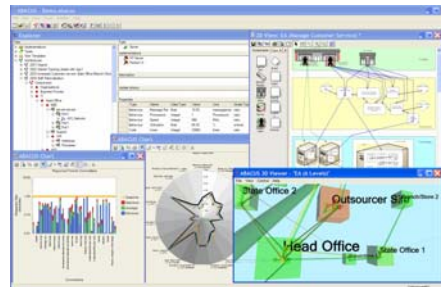
# Thank you

For more information go to;

<http://abe.eng.uts.edu.au>  
<http://www.avolution.com.au>

And get your free 30  
day trial of the  
ABACUS toolset

## Questions?



The ABACUS Architectural Approach to Computer-Based System and Enterprise Evolution

SATURN05 Pittsburgh, PA, USA. 6<sup>th</sup>-7<sup>th</sup> April 2005

