WIT 2016 ITA Module

Lecture Group #1 - Part 2

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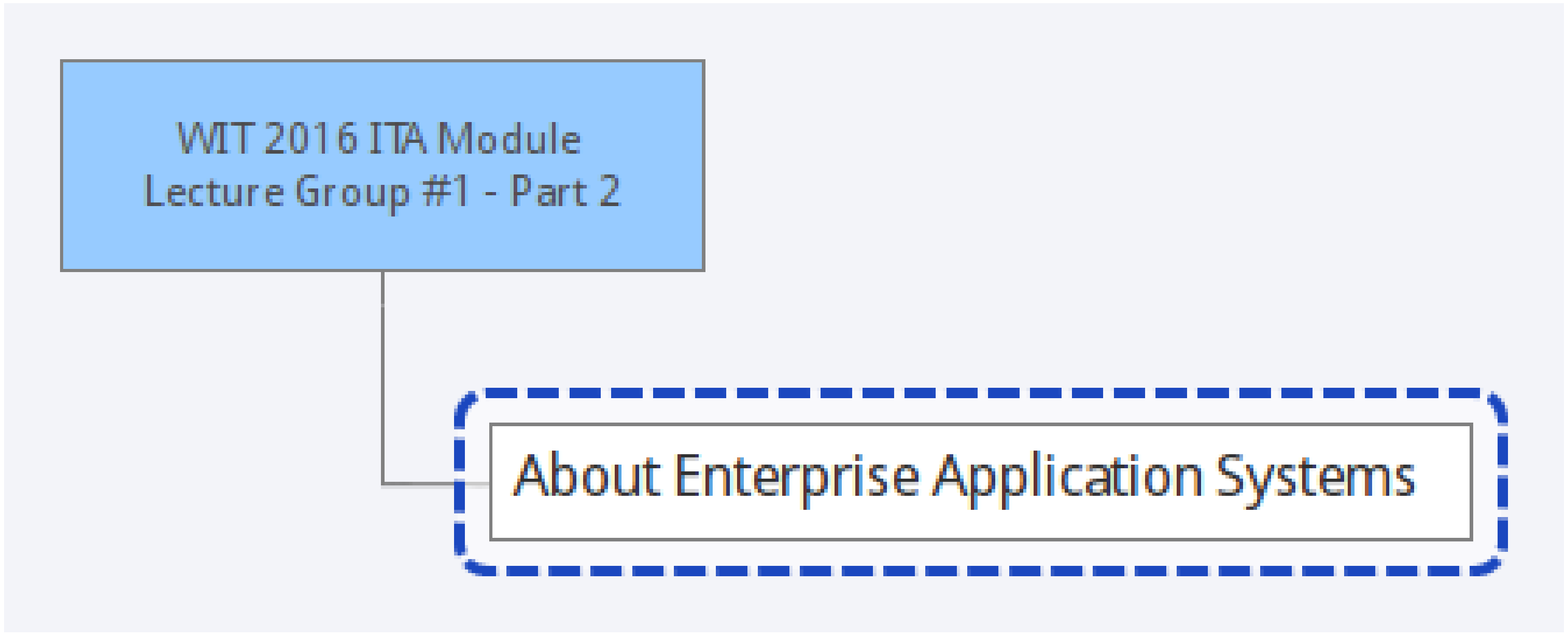
WIT 2016 ITA Module
Lecture Group #1 - Part 2
About Enterprise Application Systems

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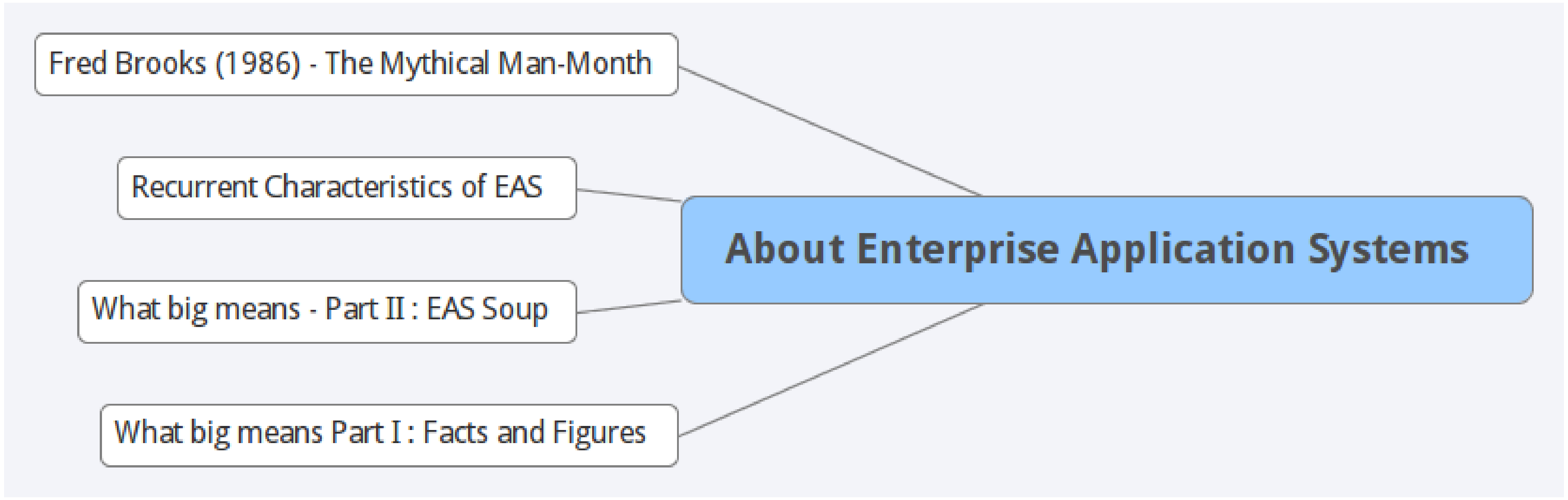
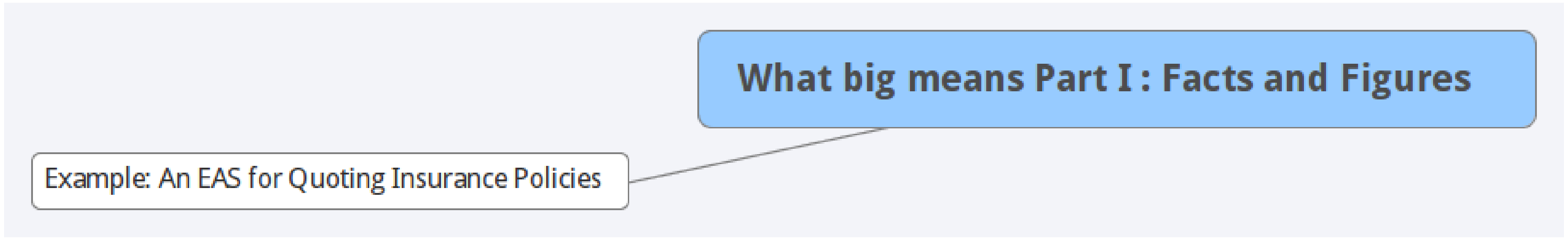

Fred Brooks (1986) - The Mythical Man-Month
Recurrent Characteristics of EAS
What big means - Part II : EAS Soup
What big means Part I : Facts and Figures
About Enterprise Application Systems

What big means Part I : Facts and Figures


What big means Part I : Facts and Figures
Example: An EAS for Quoting Insurance Policies

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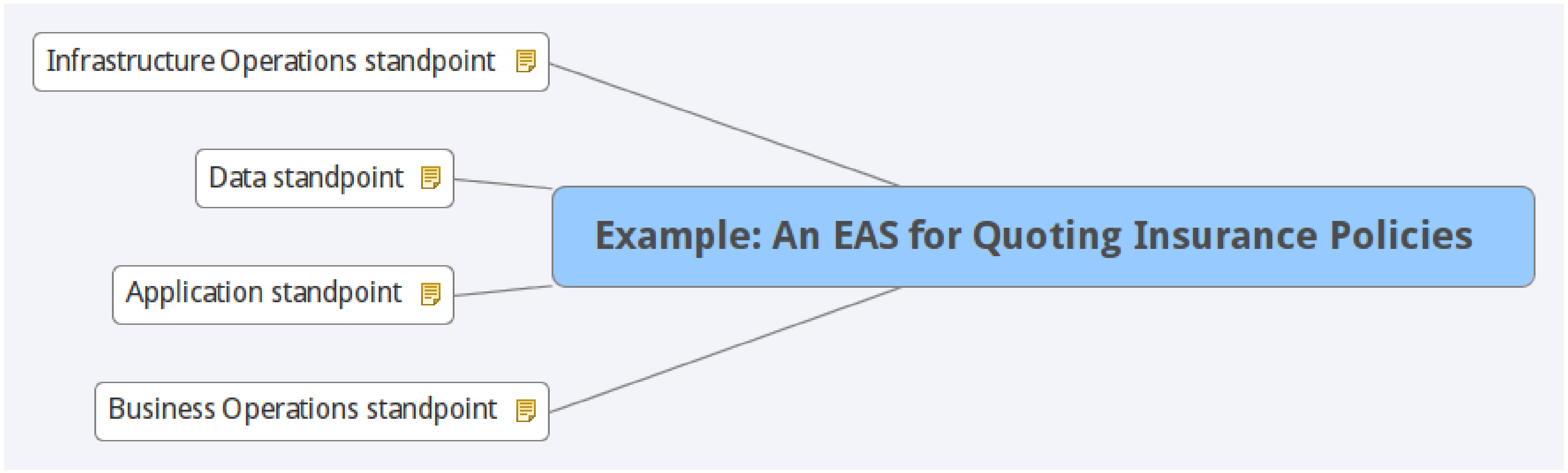

Infrastructure Operations standpoint
Data standpoint
Application standpoint
Business Operations standpoint
Example: An EAS for Quoting Insurance Policies

Business Operations standpoint

Delivered to 1850 active users, up to ~=3500

Supporting 15-20 business processes

Constant development by a distributed team of 30 developers (+ 20 outsourced) across 3 countries

Tested / load tested by by a team of 25 quality analysts

Support by 10 production system analysts

Application standpoint

~=300 visible Web UI screens developed as RIA front-end,

2 core applications quoting and administration, each designed as layered architectures,

Relies on 10 Business Rules Engine deployed as EARs components,-

Running on J2EE platform / EJB 3 with ~=20 EARs deployable components each,

100 document proposals via 1 documentation generation platform,

Interoperability with 14 other in-house applications via integration hub, mostly message queuing, a few SOAP WS,

Data persistency / access mainly via ORM, some POJO,

EDI mostly XML and value objects via RMI, some JSON,

Data standpoint

5 MS SQL 2015 databases in total supporting the system,

756 tables in core RDBMS, 1 TB after database compression on five core tables,

Largest table has 1 billion rows,

Significant amount of stored procedure logic to optimize performance.

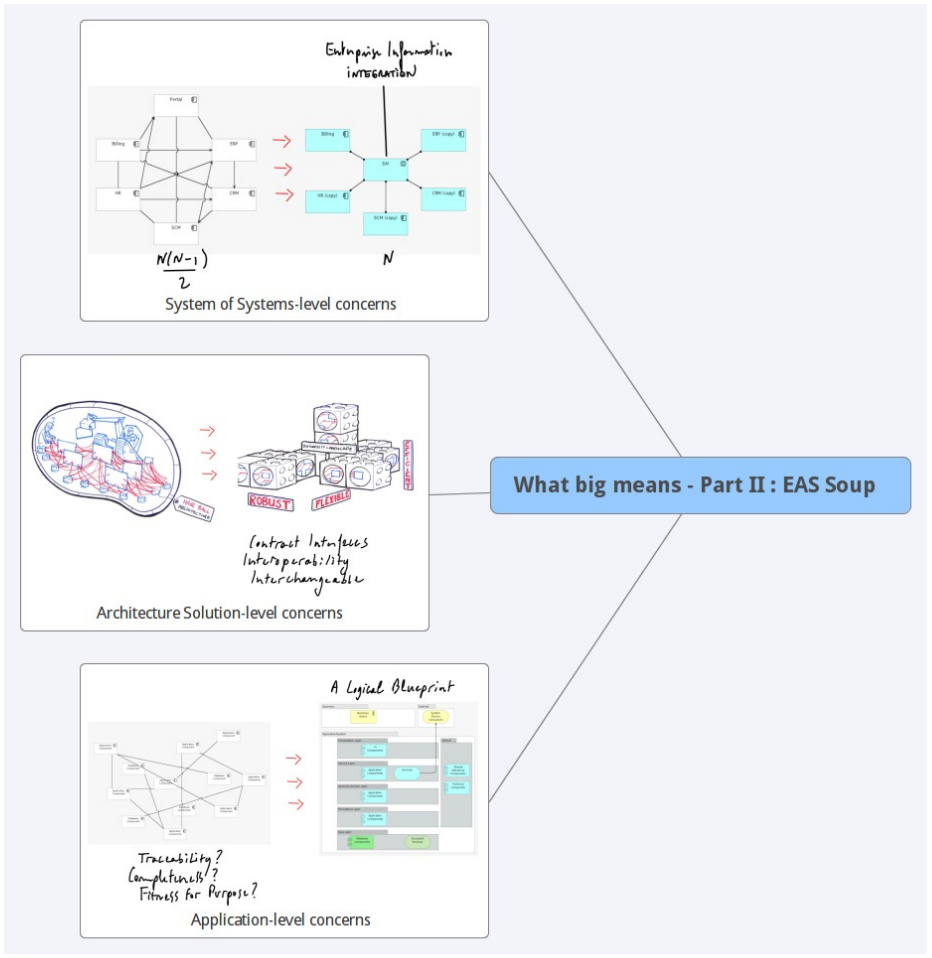
Infrastructure Operations standpoint

Deployed in AIX Virtual Machines - Weblogic 11g, java 7.

3 weblogic server instances,

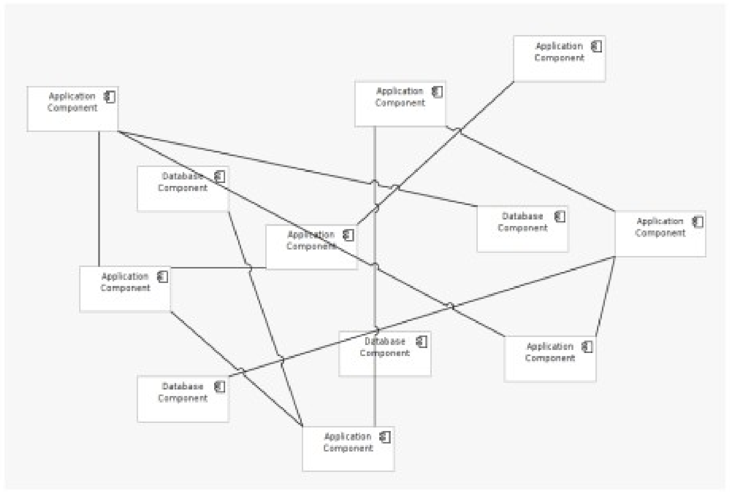
Spread across 14 clusters.

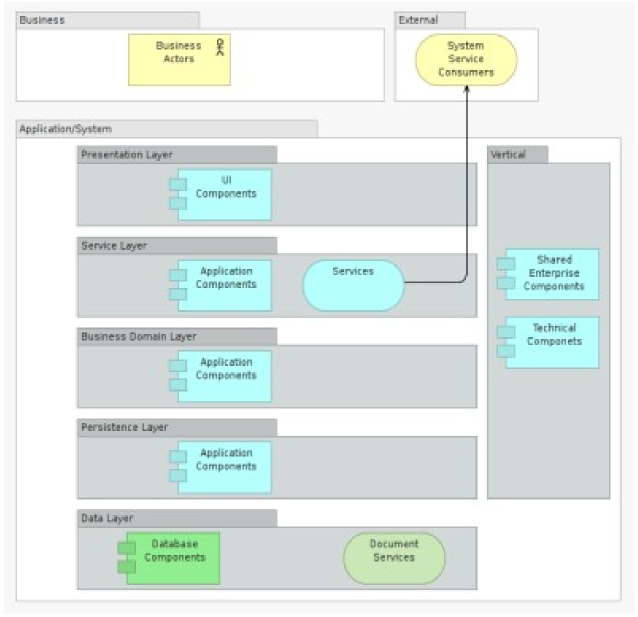
What big means - Part II : EAS Soup



Application-level concerns

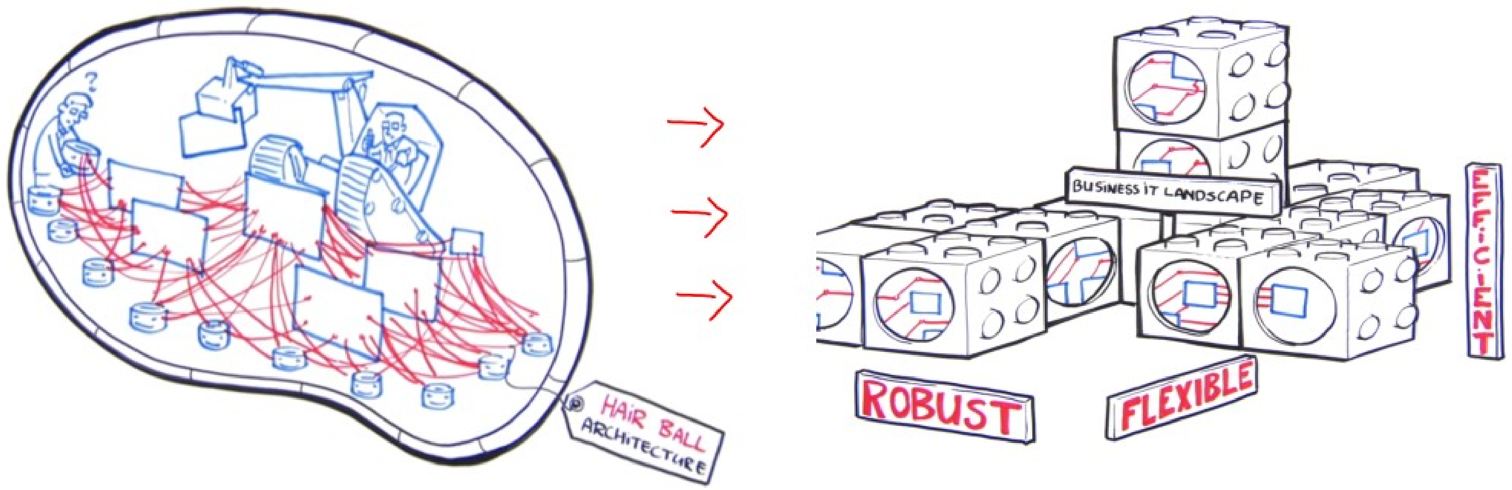
A Logical Blueprint





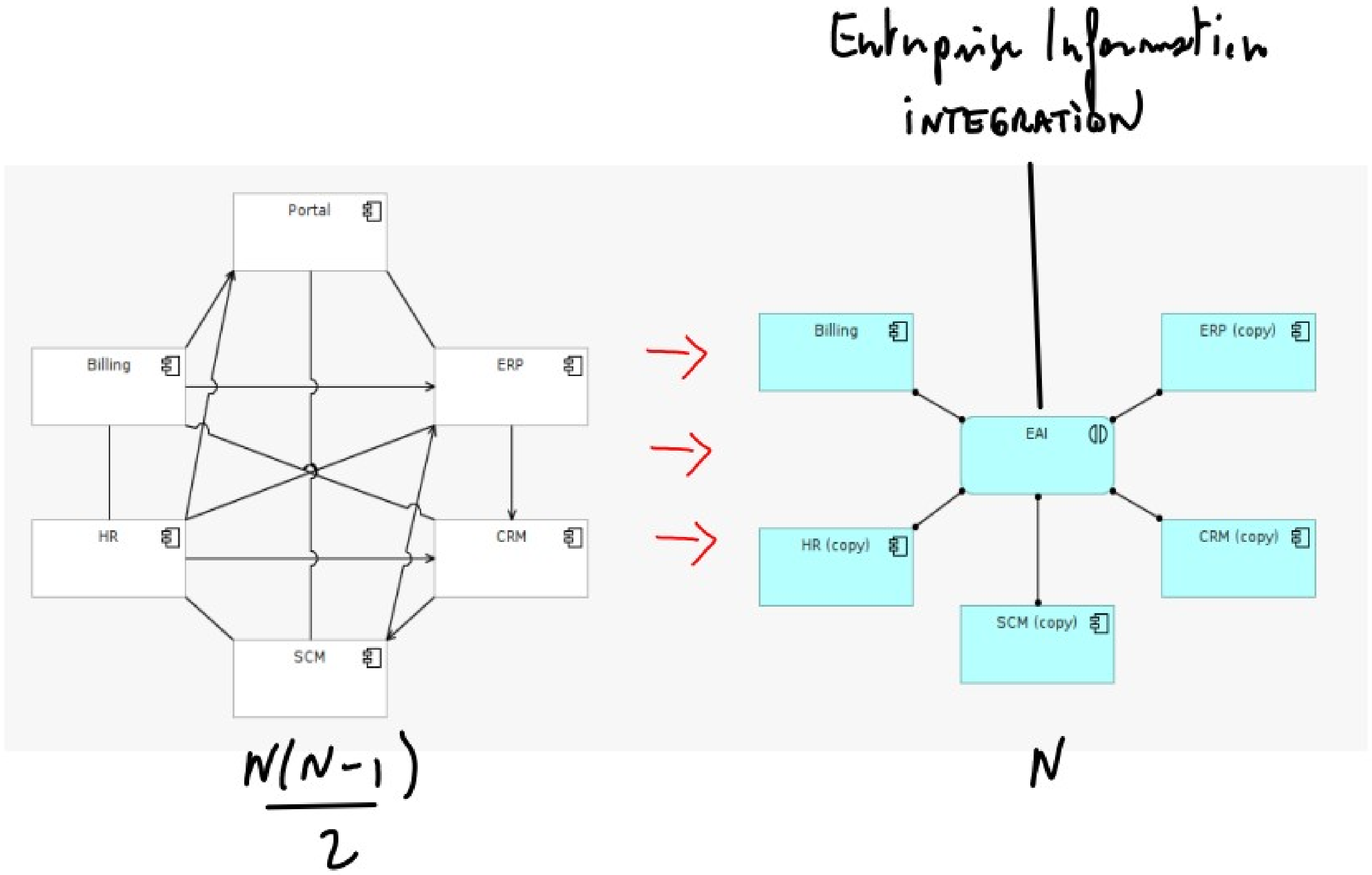
Traceability?
Completeness?
Fitness for Purpose?

Architecture Solution-level concerns

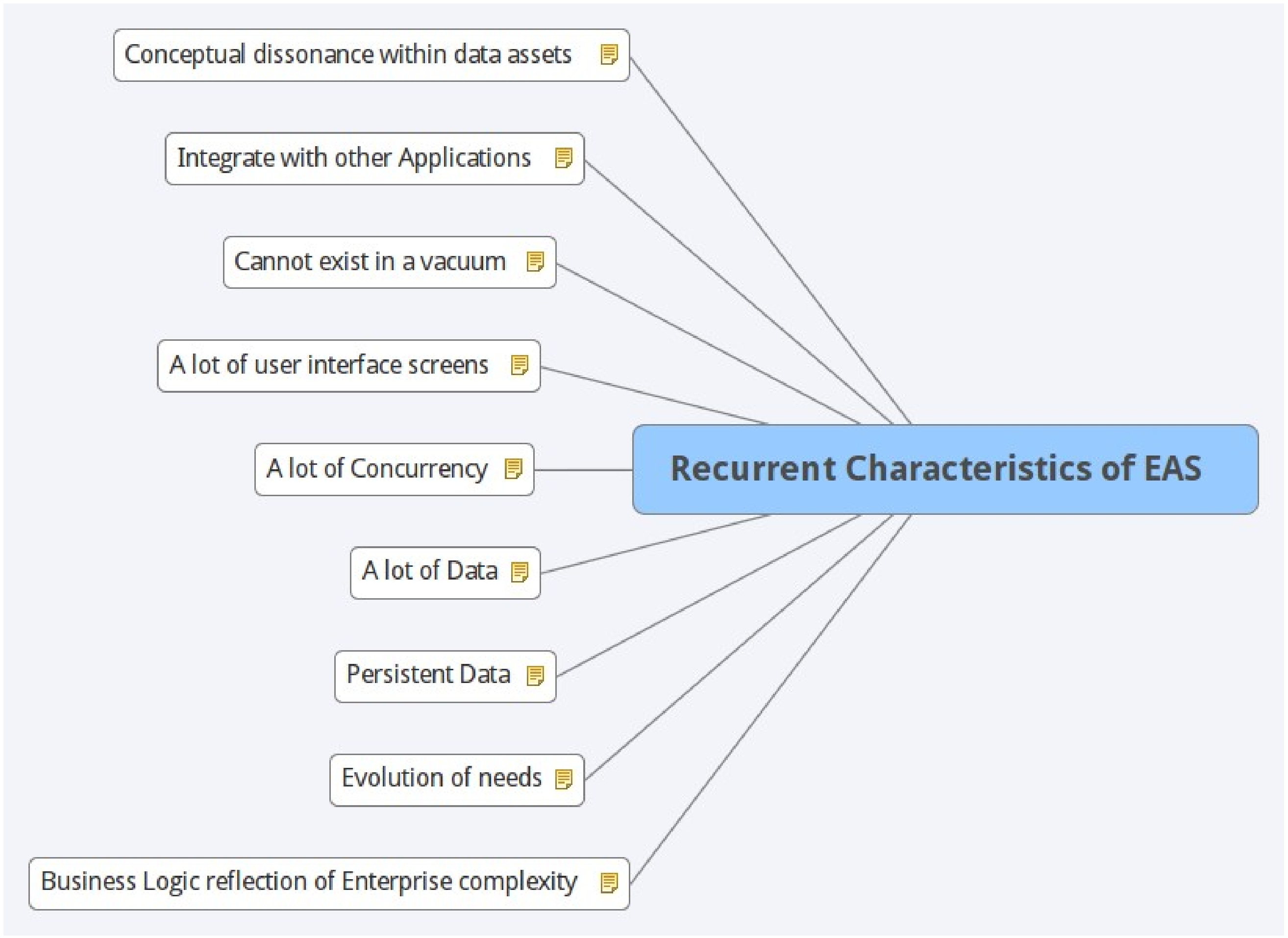


Contract Interfaces
Interoperability
Interchangeable

System of Systems-level concerns



Recurrent Characteristics of EAS


Recurrent Characteristics of EAS
Conceptual dissonance within data assets
Integrate with other Applications
Cannot exist in a vacuum
A lot of user interface screens
A lot of Concurrency
A lot of Data
Persistent Data
Evolution of needs
Business Logic reflection of Enterprise complexity

Business Logic reflection of Enterprise complexity

In stark contrast with systems software in computing sciences: highly logical and scientific,

Business pressure (pursuit of efficiency/profitability force unexpected conditions that push ESS to often interact with each other in surprising ways.

Many one-off special cases is what can easily lead to the complex business "illogic" that makes business software so difficult.

Evolution of needs

Problem changes shape faster than applications take to be built.

Business opportunities systematically emerge in mid-flight of 80 IT projects/year running concurrently.

Persistent Data

Data-as-an-asset is required to be around for months and usually years (ex. auditing, analytics)

.. during which there will be many changes in the applications that consume/produce it.

During lifetime of an application, changes to the structure of the underlying data...

... requiring ‘evolution’ of data based on older schemes.

Some ESS may even outlive hardware, operating systems and compilers that created it.

A lot of Data

A moderate system will have over several GB of data organized in tens of millions of records...

...replacing older systems used indexed file structures such as IBM's VSAM and ISAM.

Use mostly relational databases...

... although other forms of data persistence are beginning to be an option.

The design and feeding of these databases has turned into a sub-profession of its own.

A lot of Concurrency

For many systems this may be less than a hundred people...

... however, for Business critical or Web-based systems, it may be thousands or hundreds of thousands.

Major issues in ensuring that all users can access the system properly....

... with transaction managers required to ensure two users don't access the same data concurrently at the same time in a way that causes errors (ex. table locking).

A lot of user interface screens

Potentially hundreds of distinct screens...

...with role-based security, many user groups, having highly varying levels of technical expertise.

Information has to be presented in many different ways for different purposes....

...and synchronicity of data presented to all users, in the context of the process they act upon, must be guaranteed.

Cannot exist in a vacuum

Systems MUST collaborate to fulfil a task.

Enterprise rarely have the luxury to re-write existing applications.

Relationships between systems take many shapes and forms.

Dependencies between applications can only be understood in the context of what business users need to achieve.

Integrate with other Applications

There's little incentive now for large technology corporations to consolidate except when the technology is dying out.

Enterprise applications may be built at different times with different technologies,

and with different collaboration mechanisms (COBOL data files, legacy messaging systems, etc.)

Occasionally the enterprise will attempt to integrate its different systems using a common communication technology...

...but often not completed, always work in progress, performed in yearly increments,

leaving several different unified integration schemes in place at once.

Conceptual dissonance within data assets

As the business grow, miscommunication, misinterpretation, misrepresentations of data definitions occur.

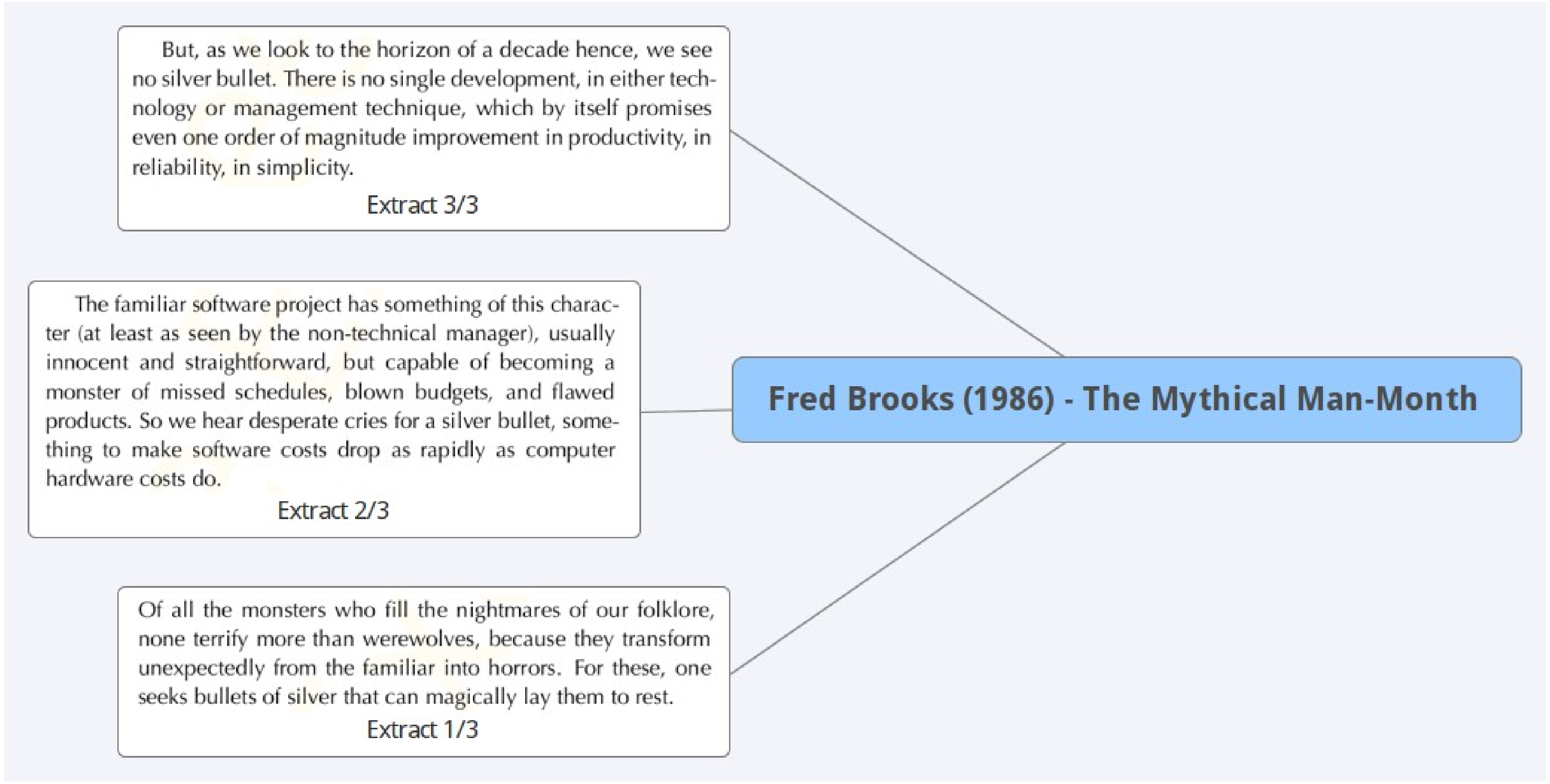
Business definitions differ by business functions, due to differences in business process,

...creating conceptual dissonance within enterprise data assets (ex. when does a prospect customer becomes a 'customer'?, at what point of the distribution process do we record a 'sale'?).

One division of the company may think a customer is someone with whom it has a current agreement; another division also counts those that had a contract but don't any longer.

As a result, data has to be constantly read, adapted, and written in all sorts of different syntactic and semantic formats.

Fred Brooks (1986) - The Mythical Man-Month



But, as we look to the horizon of a decade hence, we see no silver bullet. There is no single development, in either technology or management technique, which by itself promises even one order of magnitude improvement in productivity, in reliability, in simplicity.

Extract 3/3

The familiar software project has something of this character (at least as seen by the non-technical manager), usually innocent and straightforward, but capable of becoming a monster of missed schedules, blown budgets, and flawed products. So we hear desperate cries for a silver bullet, something to make software costs drop as rapidly as computer hardware costs do.

Extract 2/3

Of all the monsters who fill the nightmares of our folklore, none terrify more than werewolves, because they transform unexpectedly from the familiar into horrors. For these, one seeks bullets of silver that can magically lay them to rest.

Extract 1/3