

# EAI & LGOL-Net Overview

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## Agenda

- **Session 1**
  - Introduction to The Project Factory
  - **EAI and the priority outcomes**
  - **Overview of EAI principles**
  - **Overview of LGOL-Net and BizTalk**
  - **A holistic view**
  - **Workflow**
- **Session 2**
  - **Applications**
  - **Data**
  - **Systems design issues**
  - **EAI Project outline**
  - **Testing strategies**

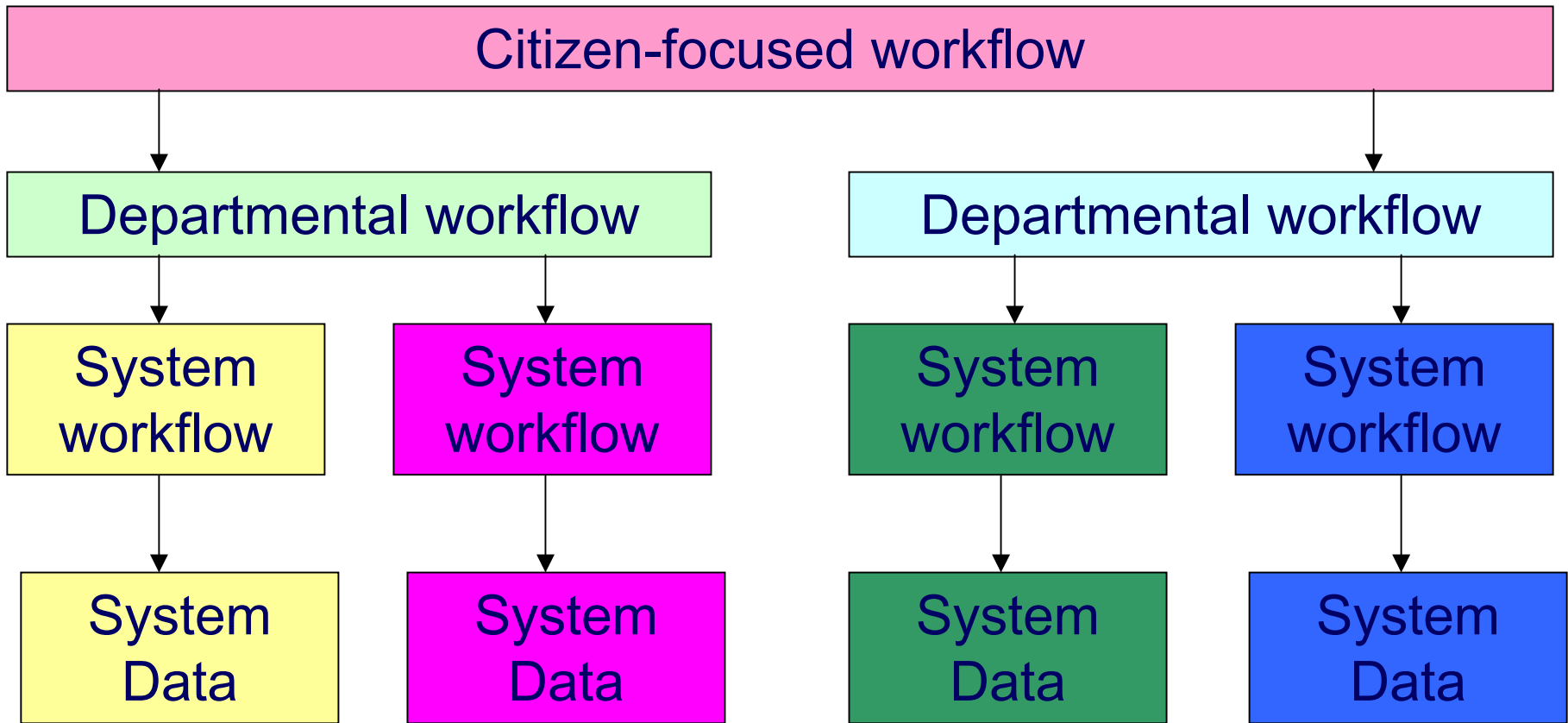
## Introduction to The Project Factory

- Pure services company
  - IT Programme and Project Management
  - IT Architecture and Design

- IS and IT Strategy
- Technology-enabled Business Design
- System Technical Specification
- Technical Project Management
- Network Design
- Software Design
- IT Security
- Disaster Recovery and BCP

- *“E-Government is not an end in itself. It is at the heart of the drive to modernise government. Modernising local government is about enhancing the quality of local services and the effectiveness of local democracy”* The National Strategy for Local e-Government (November 2002), p5
- *“assisting local government to achieve 100% capability in electronic delivery of **priority** services by 2005, in ways that customers will use”*. ODPM SR2002 Public Service Agreement
- The shared priorities are:
  - raising standards across our schools;
  - improving the quality of life of children, young people, families at risk and older people;
  - promoting healthier communities by targeting key local services, such as health and housing;
  - creating safer and stronger communities;
  - transforming our local environment;
  - meeting local transport needs more effectively;
  - promoting the economic vitality of localities.

- National priorities are the electronic delivery of key high volume / high impact local government services in terms of user benefit and efficiency savings, i.e.
  - schools admissions;
  - voting;
  - consultation;
  - planning applications; and
  - payments (including Council Tax Benefit & Housing Benefit);
- the application of local e-government to transform people's experience of public services



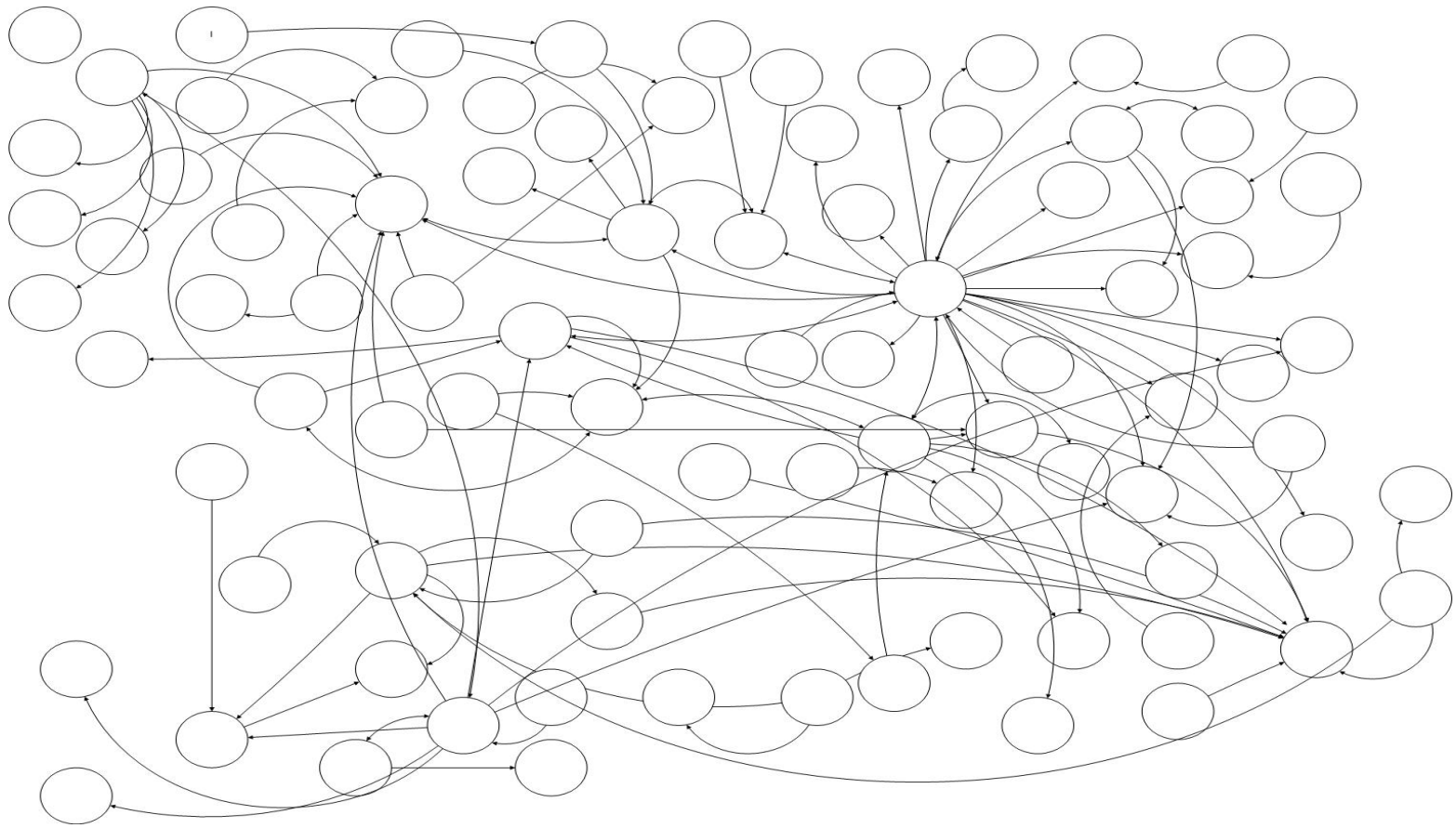
What do the priority items have in common in ICT terms?

- Multiple data sources
- Multiple applications
- Distributed workflow elements
- Multiple platforms
- Need for integration of data and or workflow
- BPR implies workflow redesign and integration
- UI has to reflect changing devices and user needs

## Enterprise Application Integration

- How do we get all this to work?
- Two approaches...

## Point-to-point connections:



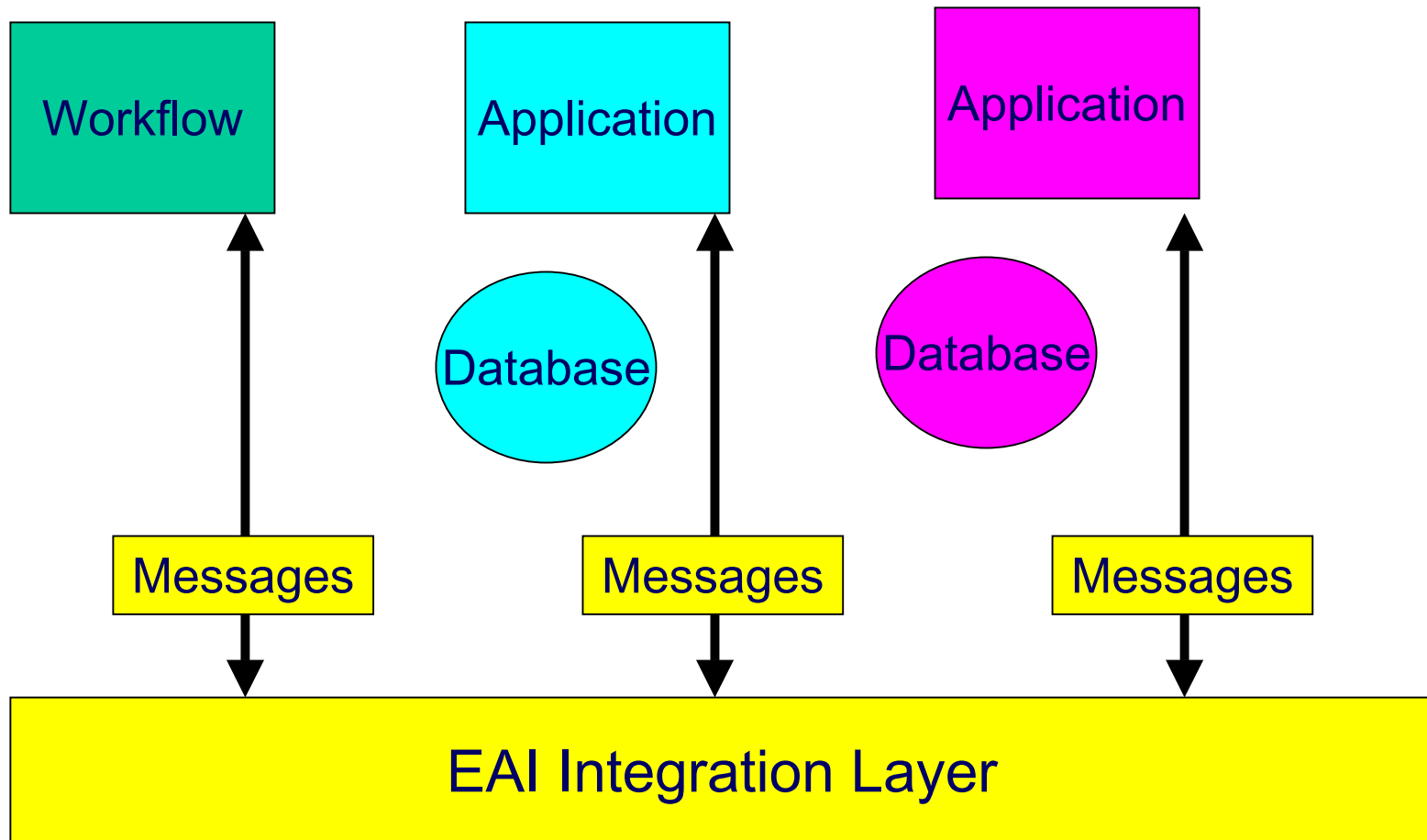
Issues with this are:

- Sustainability
- Performance
- Security
- Scalability
- Control and management

Or a more formal EAI strategy that provides:

- A controlled method of application integration
- A strong architecture for complex systems design
- A scaleable, resilient and flexible architecture
- And looks like this....

## EAI Overview



- Messaging Backbones
  - Tibco
  - LGOL-Net
  - BIZ-talk (sort of)
- Queue based systems
  - IBM MQ Series
  - Web sphere
- TP Monitors
  - Tuxedo
- Select a backbone that is right for your business
- Remember the backbone needs resources too

## Integration

- Data Integration is most common- 70%
- Workflow is next most common- 25%
- UI is least common- 5%
- CRM projects are the biggest drivers
- P2P issues are the next biggest drivers

## Advice

- EAI backbones generally work best for asynchronous communications
- Evaluate total systems requirements not just stove pipe based systems needs
- Reliability and security of the EAI architecture has to be as high as the highest individual requirements

## What is LGOL-Net ?

- Message and content based EAI integration product  
Focused on the UK Local Government requirements
- Analogous to ‘email for applications’
- Communications between different applications and on different platforms
- Resilient (both applications do not have to be reliable to communicate)
- Supports message and data transformations
- Download from [www.LGOL-Net.org](http://www.LGOL-Net.org)

- Pathfinder project
- Close involvement of OeE on deployment of government gateway for local government
- Sunderland made GovNet a pathfinder product and donated it as a GNU opensource solution to the public sector

- Open Source GNU licence, free to the public sector
- Public sector IPR written in J2EE sits on JBOSS
- Message-based integration suite/ backbone
- Available on W2K, Sun and Linux
- Release version 2.0 latest release 2.1 last week- under evaluation now
- Developed by CGI, chief architect is David Cowan
- Not as sophisticated as its COTS competitors

- PRO

- Cost effective for the right requirement
- Simple to work with / focussed on Local government
- Part of a National Programme

- CON

- Lack of technical support until recently
- Unsophisticated compared to COTS competitors
- Fewer experienced people

- Message routing
- Message transformation
- Process workflow (V 2.1)
- Channel repurposing (RSS)
- Standard interfaces to NLIS etc

- Multiple transport type support
- Automatic message rerouting
- Multiple message transformations
- Content based routing
- Authentication and authorisation
- XML schema validation
- Error handling
- Change auditing and message logging

## RSS:

- XML standard for broadcast message feeds
- Used as a tool for driving up website hits
- News-crawler functionality
- 3 different standards:
  - 0.9x
  - 1.0 (also called RDF)
  - 2.0
- Can be browsed in a news reader or repurposed

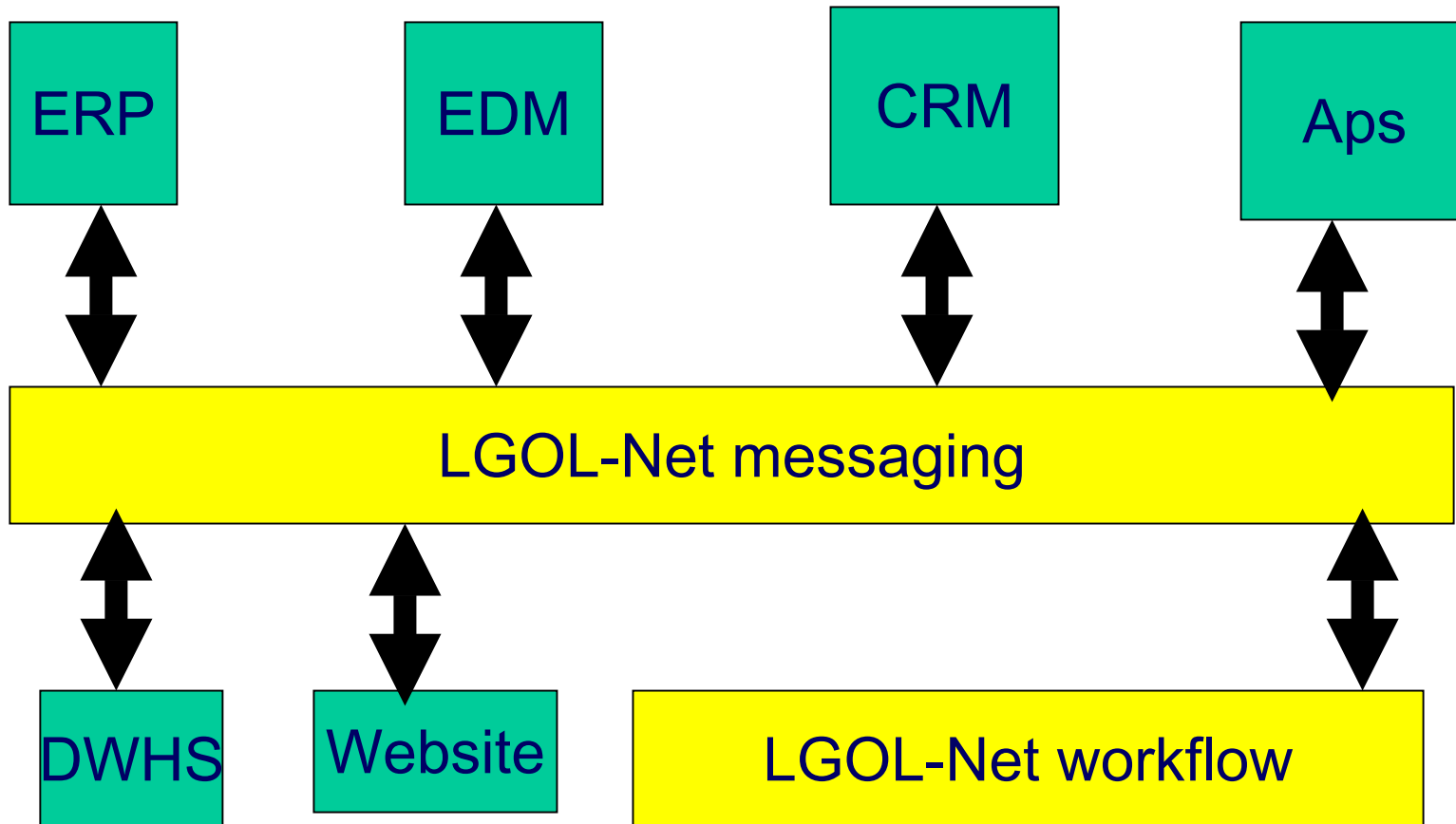
## Typical LGOL-Net Connectivity

LGOL-Net connects to:

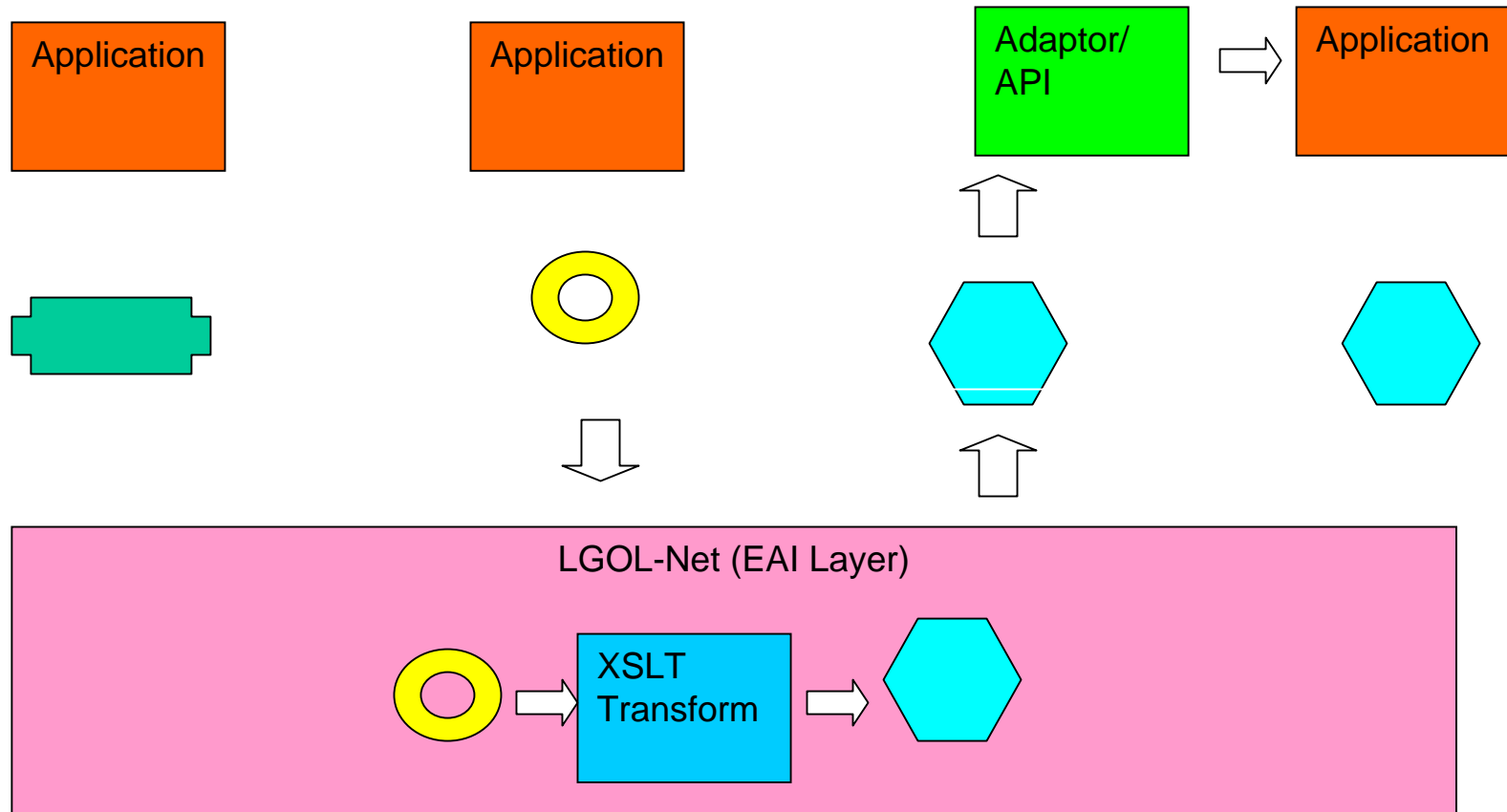
- Siebel- Open Source interface
- Newham CRM- Open Source interface
- Anite full suite of PS applications- APIs available at a cost
- OLM Care First- Open Source interface also an API at a cost
- Swift LG planning software - Open Source interface
- Plantech planning software - Open Source interface
- MVM planning software - Open Source interface
- Immediacy Content Management System - Open Source interface
- Destination Management System (Tourism system) - Open Source interface
- Valid Document Management System - Open Source interface
- Oracle AQ - Open Source interface
- Mandoforms – XML interface FOC
- Comino- Open Source\*\*
- Academy-Open Source\*\*

Logical view of type of solution:

Typical LGOL-Net Solution



## EAI Overview-LGOL-Net



## LGOL-Net Architecture Layers

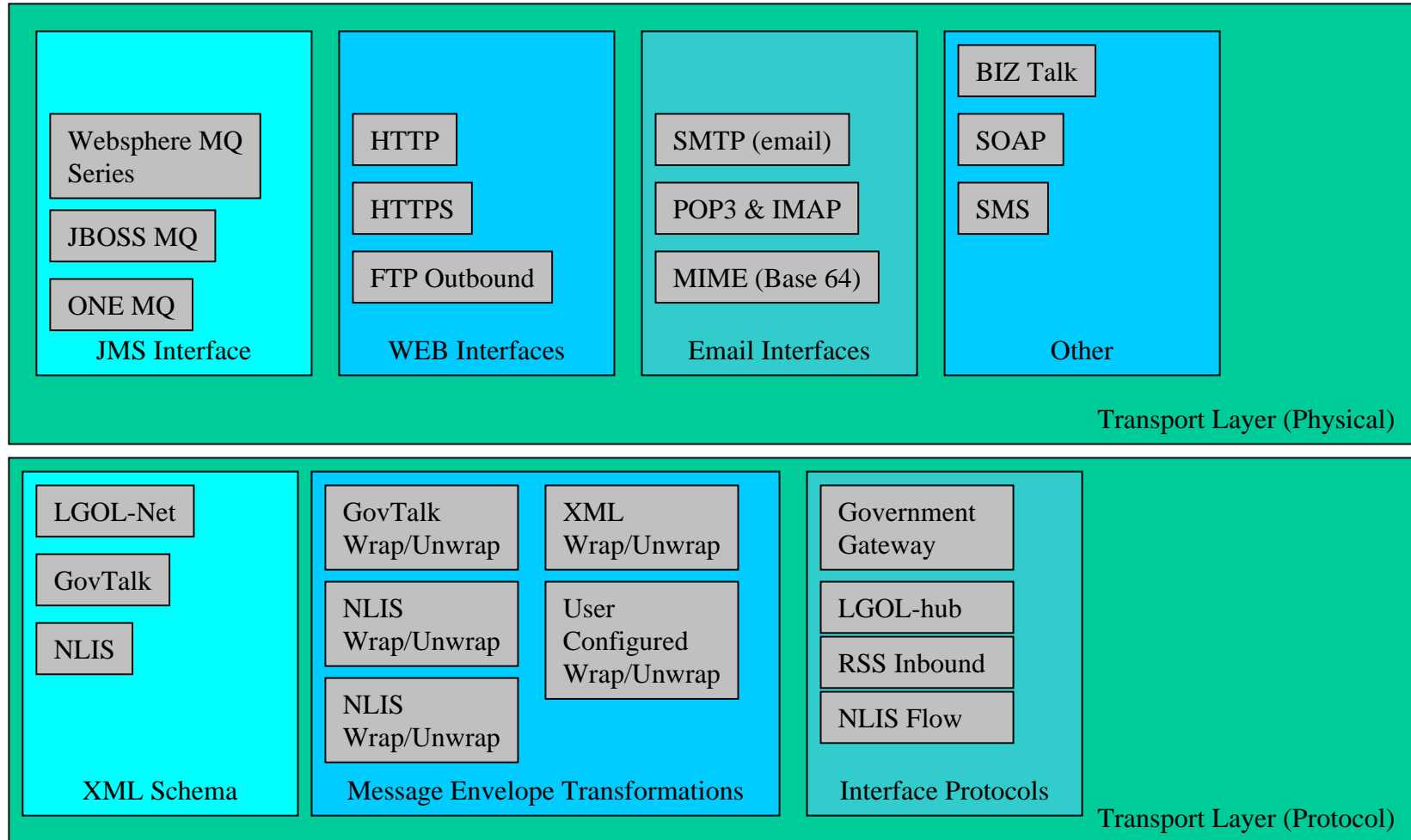


Transport Layer\

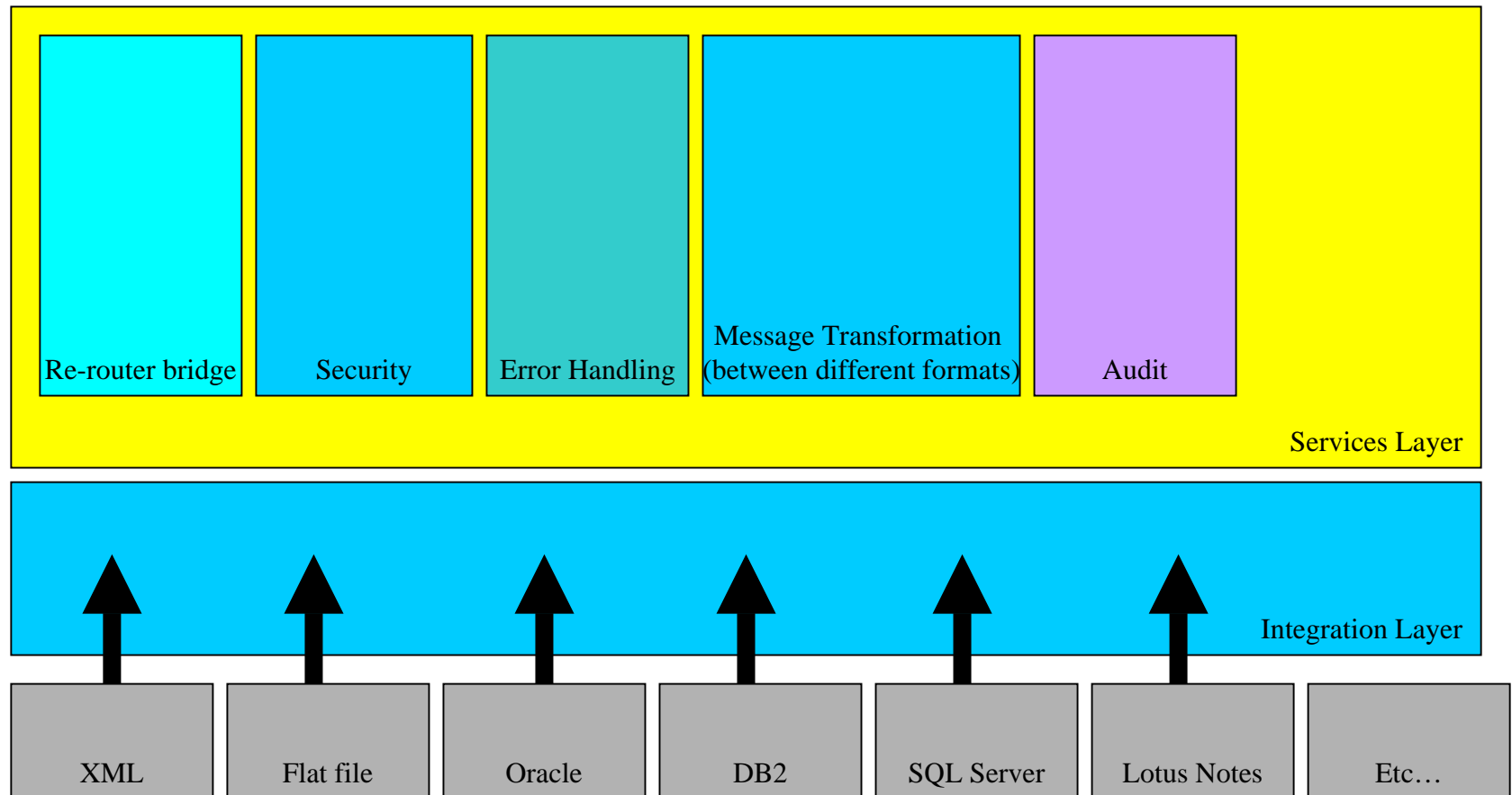
Services Layer

Integration Layer

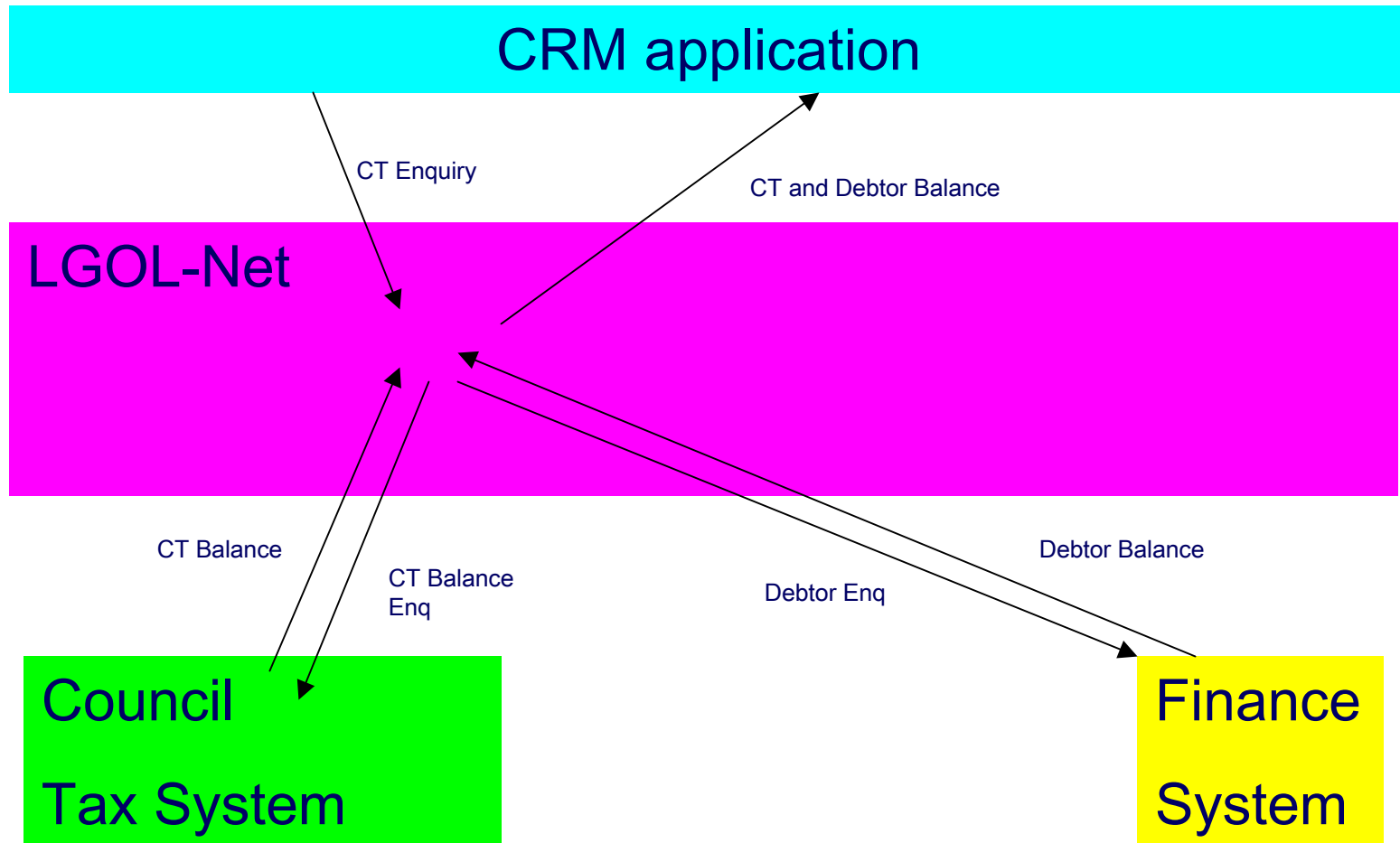
## LGOL-Net Architecture



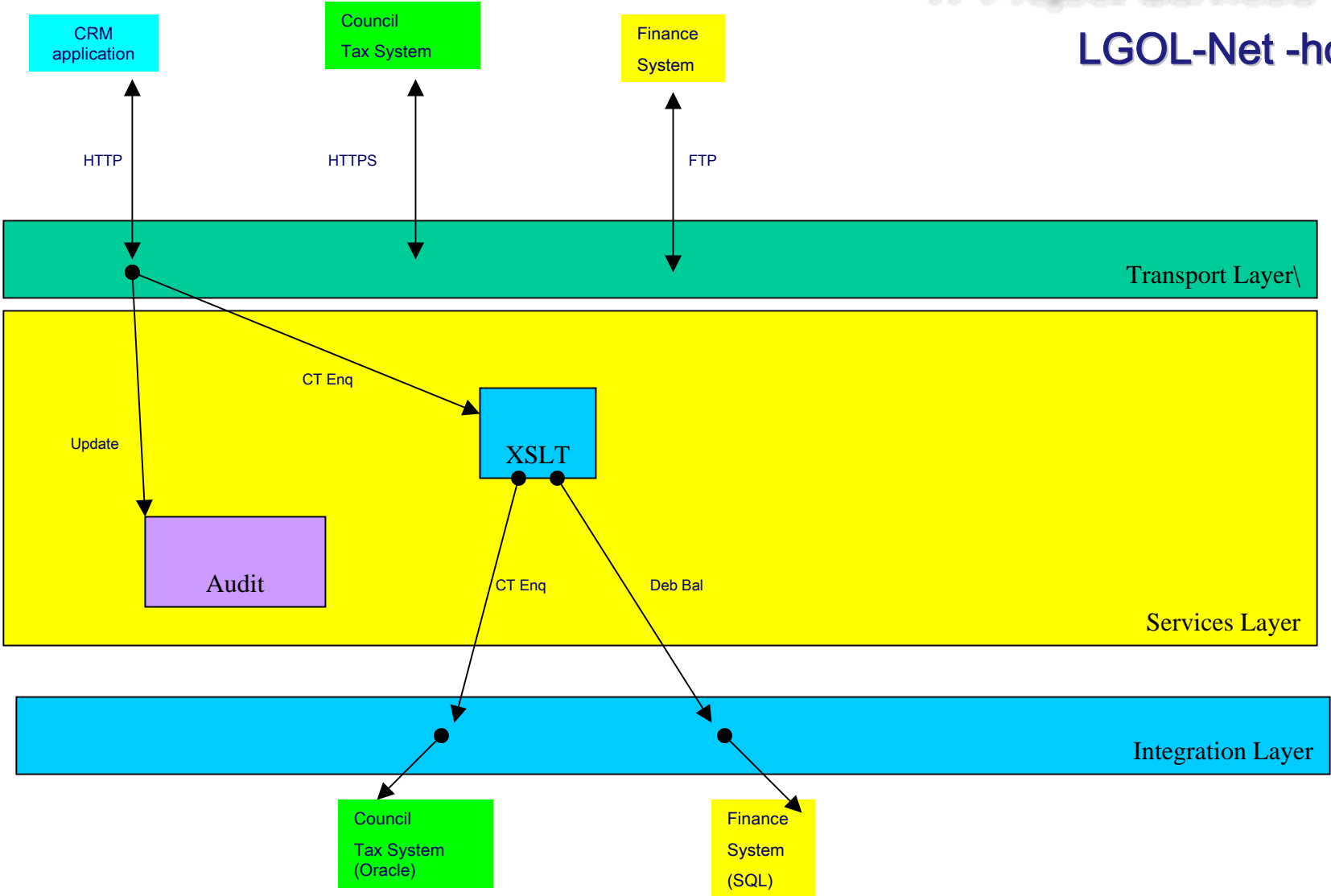
## LGOL-Net Architecture



## Possible LGOL-Net System



# LGOL-Net -how



- Closely integrated into the Microsoft product set
  - Windows 2000 etc.
  - SQL Server
  - .Net
- Good GUI based interface
- Used in a wide range of industries
- No LG user group (as far as I know) sharing expertise and adaptors
- Lots of available skills in the market

## BizTalk Overview

- Creates the documents involved in the application/process as well as their respective schema definitions using the Schema Editor, a BizTalk Server module accessed from within Visual Studio .NET.
- The Schema Editor enables you to define the structure and semantic metadata that “declares” the meaning, functions, and processing requirements of the content of a document, as well as a visual tree node reference model of the schema.
- Create and define the transformation requirements for any document interchanges.
- The BizTalk Server Mapper. The transformation maps are used to process and convert the content and structure of any source information (based on its schema representation) into any target document format, such as a report

## BizTalk Overview

- Each transformation map created by BizTalk Server Mapper is based on XSLT, an open standards protocol for transforming XML information.
- Specification of the business logic governing event execution.
  - If the business logic is simple, this can be embedded as an expression directly within a BizTalk Server orchestration decision step.
  - If the business logic is complex, the BizTalk Server Rules Composer can be used to create and process the sophisticated rule sets.
  - Each rule set (or “Policy”) drives a specific activity or function and becomes a resource object embedded into a BizTalk Server orchestration.

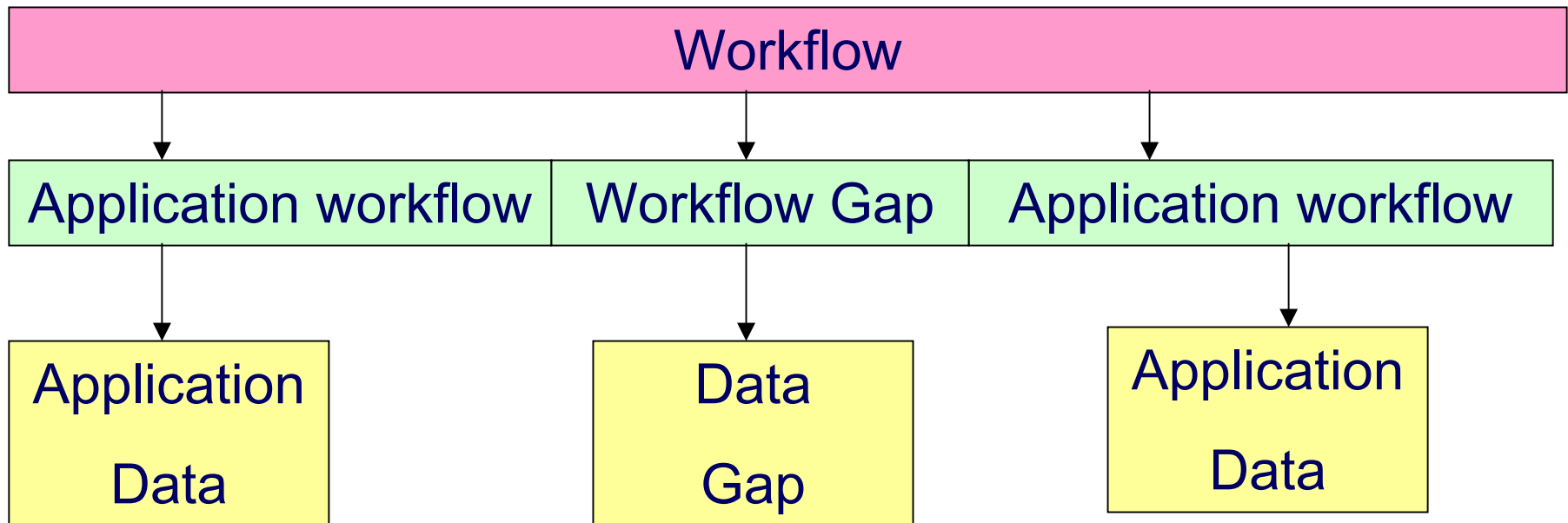
- Summary on BizTalk:
  - o Close-coupled into the MS stable
  - o .Net focused
  - o Comes with very sophisticated tools and a visual UI
  - o Licence fees.....

- EAI is about more than a core messaging technology
- Key to this is a focus on:
  - Workflow
  - Business Logic
  - Data access and transformations
  - Security, availability and performance
- Don't fall for the common mistake of just trying to upscale a POC!

- Overview of workflow
- Relationships between workflow, applications and data
- Planning and capturing workflow
- Workflow maintenance

- Overview of workflow
  - Workflow is the representation of business process and it's access to the relevant applications and data sources
  - Workflow will not always map to an application and/or data source
  - Look at the cost-engineering aspects of workflow mapping- does a systems implementation make economic sense?
  - There may well be a place for n-tier interim databases in an EAI design for practical reasons
  - Workflow changes for a host of reasons

- Relationships between workflow, applications and data



- Planning and capturing workflow
  - Start with the definable workflows
  - Remember a workflow has to be maintained
  - Don't be tempted to get too sophisticated if you don't have to
  - Use proven simple tools, UML is fine but so are flow charts, support these with effective simple tools like Visio
  - Don't underestimate the time this step takes
  - Ensure you have applications expertise for the mapping phase
  - Ensure you build a LDM for the data items (see later)
  - If workflow spans systems and data owners, expect the negotiation to take a while!

- Workflow Maintenance
  - Version control
  - Don't forget in a service oriented paradigm, workflow allows great flexibility
  - This has to be constrained by the normal engineering disciplines of design, configuration, test, documentation and the like
  - Workflow is worthless without user documentation and training
  - Drivers for workflow change are:
    - Statutory
    - Government initiatives
    - Changes to underlying applications
    - Changed channels of communications

- Session 2
  - Applications
  - Data
  - Systems design issues
  - EAI Project outline
  - Testing strategies

- Application connectivity issues
- Mapping APIs
- Mapping Applications to data
- API functionality
- API negotiations with suppliers
- Swapping Applications out

## Application connectivity issues

- Main issues in application connectivity:
  - Who owns the data and the application
  - Existing APIs and point-to-point connections
  - Data out and data in
  - Interim databases/ n-tier approach
  - Security- the sum of the parts
  - Reliability- the product of the parts
  - The role of screen scraping

## Mapping APIs

- Build a base API map for all the APIs in the system and their status:

Application	API Name	Direction	Logical Data Items	Availability	Owner
Payroll	Add/Del_Employee	Inbound	Emp_Name, Emp_NI_Num, Emp_Works_Num, Emp_Address, Emp_Tel_Num, Emp_Grade, Emp_Status	Now	Accounts
CRM	Add/Del_Client	Inbound	Client_Name, Client_Ref_Num, Client_Address, Cleint_Tel_Num, Client_Status	Dec-04	Customer Services
Voting Register	Get_Voter_Address	Outbound	Voter_Name, Voter_Address, Voter_Tel_Num	Jan-05	Voter Registration

## Mapping Applications to data

- Don't try to build a full ELDM
- Do map the key items of workflow to their required logical data items
- Do map this logical data to it's application source(s) and sink(s)
- Remember some data will have multiple physical sources
- Some data may have no source at present
- Start to identify the master sources of data items
- Watch out for aggregated data security issues
- Look for the compromises that need to be made

## API functionality

- API Functionality is related to the workflow requirement and is not an abstract issue
- An adaptor is an API that has interconnection capability to the selected EAI bus
- Be sceptical of 'all singing all dancing' APIs- I've yet to find one!
- Performance of the whole system is dependant on the performance (hence design and implementation) of the adaptor
- Some elements of the workflow may be best located within the API or adaptor
- If someone has developed an API/Adaptor for a similar function ask how much is your different requirement worth?

## API negotiations with suppliers

- Suppliers and application owners are the only people who can provide an API to their code
- Don't just hack into systems, this will almost certainly invalidate warranties and may well corrupt systems
- Negotiation as part of a community works best
- Our experience:
  - 30% do it for free
  - 40% ask for the development cost but then make it freely available
  - 30% charge for their APIs- could be £2k could be £250k
- For new suppliers free APIs are a cheap way to win market share

## Swapping Applications out

- Never a trivial issue
- Easier in a properly architected and implemented EAI environment
- Main issue is when the application is the source of a master logical data item
- Can consider replacement (gradual or sudden) of application workflow and functionality with the workflow components of the EAI architecture

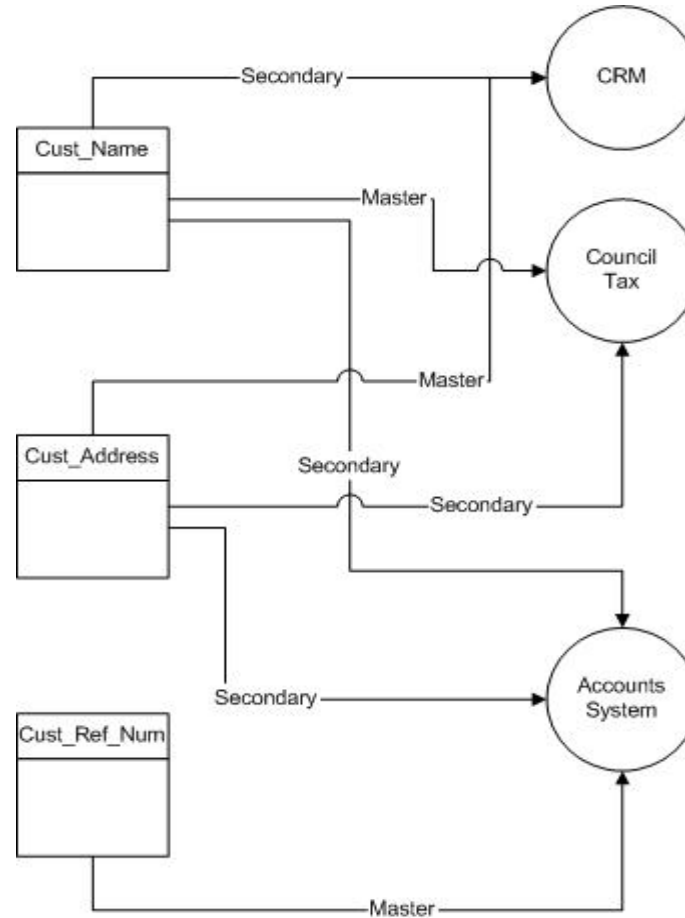
## Data

- Data mapping to applications
- Logical Data Modelling
- Physical Data Modelling
- Canonical data as an approach
- N-tier data and the data compromise issues
- Performance and reliability issues and data

## Data mapping to applications

- Don't try to map all the data within an application
- Only focus on the data that relates to the LDM for the workflow elements of the systems design
- Remember this is a LOGICAL data mapping exercise
- This will result in a one to many and many to one situation:

## Data mapping to applications



## Logical Data Modelling, Physical Data Modelling and Canonical data

- Logical data has to be mapped to Physical data representations at each application level
- This gives rise to the XSLT transformation rules needed
- We need to do the minimum number of translations possible
- Enter Canonical data as the answer:
  - Select the master data source for a logical data item
  - Make the default representation of this equivalent to the master application physical data model
  - All other sources will do a translation
  - The master source has a null translation need

## N-tier data and the data compromise issues

- For many reasons (cost, complexity, time, performance) it may not be possible/practical to acquire API access
- This can be spoofed by adding in an n-tier service database
- Example:
  - Cannot add new address records to the council tax system via an API
  - Add these to an interim tier database instead
  - Option to check these separately or to use a bulk upload facility
  - This can lead to application functionality being subsumed by stealth

## Performance and reliability issues and data

- Even a professionally written API can cause record locking and resource contention issues
- These can result in systems performance issues
- For high transaction rates this may mean developing other architecture strategies such as mirrored databases
- Use the opportunity to do some data cleansing!

## Systems Issues overview

- Systems design issues
- EAI and systems topologies
- Security issues
- Reliability and performance planning
- The Project Office's NFR document (Non-functional Requirements document)
- Workflow and EAI separation

## EAI Project outline

- Timing
- Schedules
- The skeleton plan
- Testing strategies
- Maintenance of the results- the EAI approach  
and evolution of the systems

## Timing and Schedules

- Timing
  - Because of the multi-application and data owner issues EAI projects are structured differently
  - Allow up to 3 times as much PM resource for the negotiation issues
- Schedules
  - Stick to the skeleton plan (to follow)
  - Remember the growth in the number of interdependencies
  - MUST have executive level sponsorship and backing to make a major EAI project work in any real organisation

## The skeleton plan

- Workflow definition
- Data and application mapping
- ELDM and EPDM development
- API negotiations and API mapping
- Canonical data form development and XSLT translation development
- Workflow development
- Unit test
- Integration
- Integration test
- Training and documentation
- Support and maintenance

## Testing strategies and Maintenance of the results

- Testing can happen at all levels
- Workflow can be tested without code
- APIs can be tested at the raw level
- Unit and integration test is the same as for an application development
- On maintenance activities (for instance the upgrade of a back end application) testing is required before go live, this has implications for systems availability and systems topologies, ideally you need a test environment
- Remember the SOPs, documentation and end user training all need maintenance
- Biggest testing and maintenance challenges come on swap of a back end system

- Priority outcomes imply :
  - Citizen-centred workflow
  - Inter-application interoperability
  - Data interchange
  - Distributed workflow elements
- EAI provides a strong architecture to support the ICT requirements of the national priorities
- LGOL-Net is one of a number of integration products that supports message based EAI (but not the only one)
- LGOL-Net is strongly focused on the UK Local government market

## Conclusions

- EAI is focussed towards a services oriented approach to functional delivery
- EAI and workflow development provide a higher level schema for addressing functionality and data
- The key to this is workflow and data
- There are a host of products on the market to support these approaches but in our view in the UK local authority market LGOL-Net is a strong contender
- Detailed training and support is needed if you go down this path
- This is only a short overview course
- If you leave your email address we will post you copies of all the documentation and slides

## Our LGOL-Net services

Fixed price services covering:

- Project and programme management
- Business process engineering
- Systems and data architecture consultancy
- Systems design
- Training:
  - Suite of standard technical training courses
  - Management and executive level training
  - Bespoke courses