

# OPEN MODELING METHODS

Greater complexity and wicked problems  
Integration of social and technical systems  
Growing importance of collaboration in interagency and  
business unit collaboration

Non-functional requirements  
Open modeling methods  
Identifying open modeling concepts

Research Projects  
Improving cognition through different perspectives  
Modeling Collaboration  
Agile Development Processes

**The Need for Open Modeling Methods for Complex  
Environments**

# MelCa addresses trends from single independent processes

## INCREASING COMPLEXITY

Continual product improvement

**NOT complicated**  
**BUT complex (unpredictable)**

## IMPACT OF COMPLEXITY

Emergence of new ideas

Importance of process integration

Self organization

Unexpected events

## INCREASING NETWORKING

**Getting expertise**  
**Getting special products**

**When one process changes  
other processes are effected.**

# More and more wicked problems with non functional requirements

Every wicked problem is **unique**.

Wicked problems **cannot be precisely defined**.

The problem of poverty in Texas is grossly similar but discretely different from poverty in Nairobi, so no practical characteristics describe "poverty."

**Making a city safe**  
**Improving health**  
**Better access to drinking water**  
**Securing a food supply**

It's **hard, maybe impossible, to measure or claim success** with wicked problems.

Solutions to wicked problems **can be only good or bad, not true or false**

There is **no template to follow when tackling a wicked problem**, although history may provide a guide. Teams that approach wicked problems must literally make things up as they go along.

There is always **more than one explanation for a wicked problem**, with the appropriateness of the explanation depending greatly on the individual perspective of the designer.

No mitigation strategy for a wicked problem has a definitive scientific test because humans invented wicked problems and science exists to understand natural phenomena.

Offering a "solution" to a wicked problem **frequently is a "one shot" design**.

# Examples

## SMART CITIES

- Better transportation
- Easy access to health care
- Flexible education (Connected Campuses)
- Public safety
- A variety of activities

- Building management – monitoring
- Waste management
- City administration

## **Internet of Things**

- Sensors of activities
- Intelligent support
- Improving processes through better context awareness

## **Interagency collaboration**

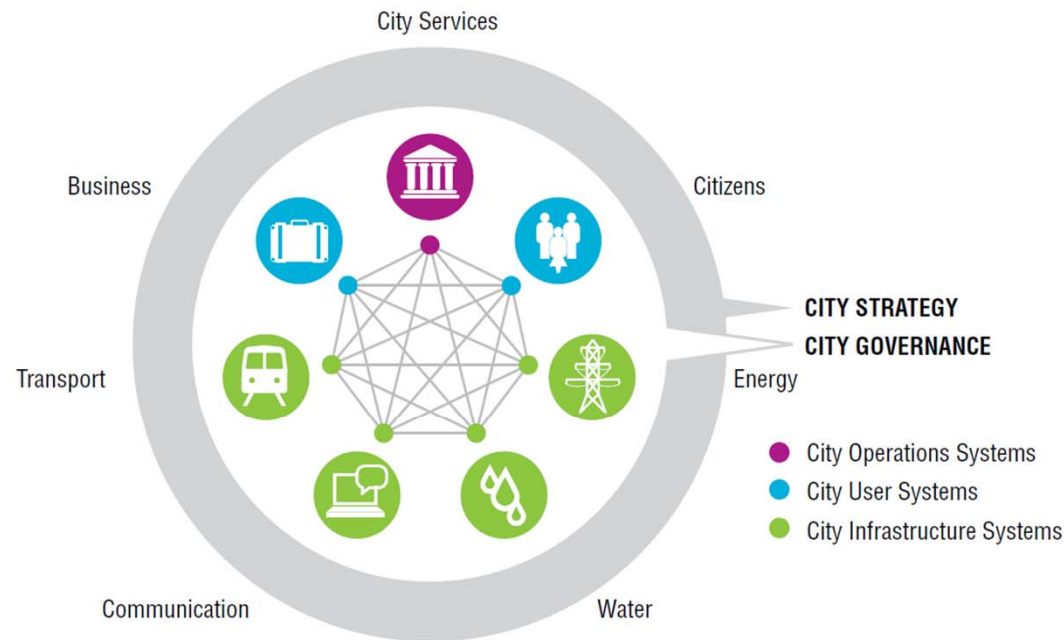
- Sharing knowledge
- Defining knowledge flows
- Improving decision making
- Focusing on emerging requirements



# A CITY IS A SYSTEM OF SYSTEMS

<http://public.dhe.ibm.com/common/ssi/ecm/en/gbe03227usen/GBE03227USEN.PDF>

they have established, cities must look to the systems on which they are basing their aspirations and make them more efficient and effective, i.e., *smarter*.



Source: IBM Center for Economic Development analysis.

# A more socially oriented enterprise

http://www-935.ibm.com/services/us/en/c-suite/ceostudy2012/ UTS: FEIT Student Intranet IBM 2012 Global CEO Study

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## Leading Through Connections

Insights from the Global IBM CEO Study  
Register now to get your copy >

### Featured content

**Study highlights**  
How are CEOs and senior public sector leaders responding to today's connected era?  
Download the IBM CEO Study highlights (3.5MB)

**Event replay: C2-MTL keynote presentation**  
2012 Global CEO Study findings presented by Marc Chapman, Managing Partner, IBM Global Business Services.  
[View this video](#)

**2012 IBM CEO Study major themes**  
Learn more

- ↓ **Employees. Empowering employees through values**
- ↓ **Customers. Engaging customers as individuals**
- ↓ **Partnering. Amplifying innovation with partnerships**

### Overview

For some time, businesses have been refining and optimizing their networks of suppliers and partners. But something just as meaningful has been happening – the sudden convergence of the digital, social and mobile spheres – connecting customers, employees and partners in new ways to organizations and to each other.

In speaking face-to-face with 1,709 CEOs, general managers and senior public sector leaders around the globe, leaders confirmed that our new connected era is changing how people engage. How are CEOs responding to the complexity of increasingly interconnected organizations, markets, societies and governments? Our key findings center on:

- ↓ **Employees. Empowering employees through values**
- ↓ **Customers. Engaging customers as individuals**
- ↓ **Partnering. Amplifying innovation with partnerships**

[Register now](#)

### Empowering employees through values

### Contact us

[ibv@us.ibm.com](mailto:ibv@us.ibm.com)

Connect with us

### Industry and market segment perspectives

**IBM CEO Study implications**  
[See all industry and market segment perspectives](#)

### Infographics: See it in pictures

**How will CEOs change their use of social media? What could put CEOs on the path to outperforming?**  
[See all CEO Study infographics](#)

### People are saying...

[+] Feedback

1:47 PM

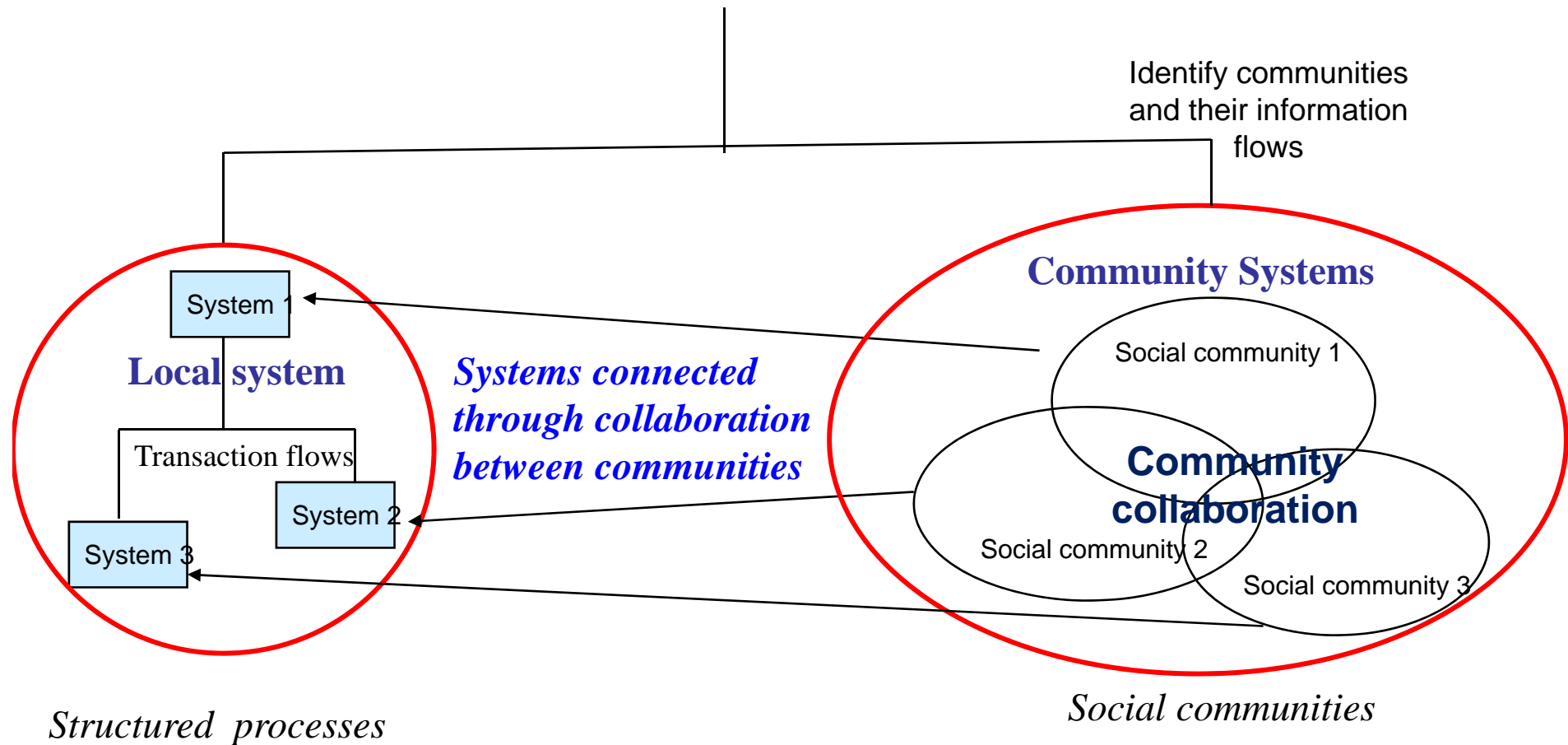
# Social Businesses

The screenshot shows a web browser window with the following content:

- Top Left:** "IBM Global Business Services Datasheet"
- Top Right:** "Strategy & Transformation"
- Center:** "Becoming a Social Business" in large blue font, with the subtitle "Social Business Enterprise Strategy Accelerator" in italics below it.
- Left Side:** The IBM logo is displayed above a horizontal line, followed by the heading "Highlights". Below this, there is a bulleted list:
  - Understand your adoption of social media for both internal and external purposes.
  - Articulate how social media accelerates and challenges your business strategy.
- Right Side:** A paragraph of text: "A transformation is taking place in how people interact and how relationships form and develop and this is changing the way we socialise, the way we work and the way we engage with our customers. The new normal is that customers are leading the conversations that define your brand, competitors are crowd-sourcing ideas to bring new offerings to market and employees are using social media in all facets of their lives, including work." Below this is another paragraph: "This shift in technology and human behaviour presents an opportunity for organisations to improve everything from reinventing customer relationships to how work gets done. A Social Business embraces"

The browser's address bar shows a URL from public.dhe.ibm.com. The taskbar at the bottom includes several open applications, including a short-course, faculty IT communications, an IBM report, and two BPM125 lecture presentations. The system clock shows 1:50 PM.

# Importance of social structures in the system of systems to include collaboration



# Evolution of Design Process

Type 1 – agreement on problem, agreement on solution



Make jeans



Sell at home

Type 2 – agreement on problem, no agreement on solution



Make jeans



Where to sell

Type 3 – no agreement on problem, no agreement on solution



What to make



Where to sell

*Decreasing  
precision in  
requirements*



Methodologies to design more complex and adaptive systems

**How to design business processes in these environments**

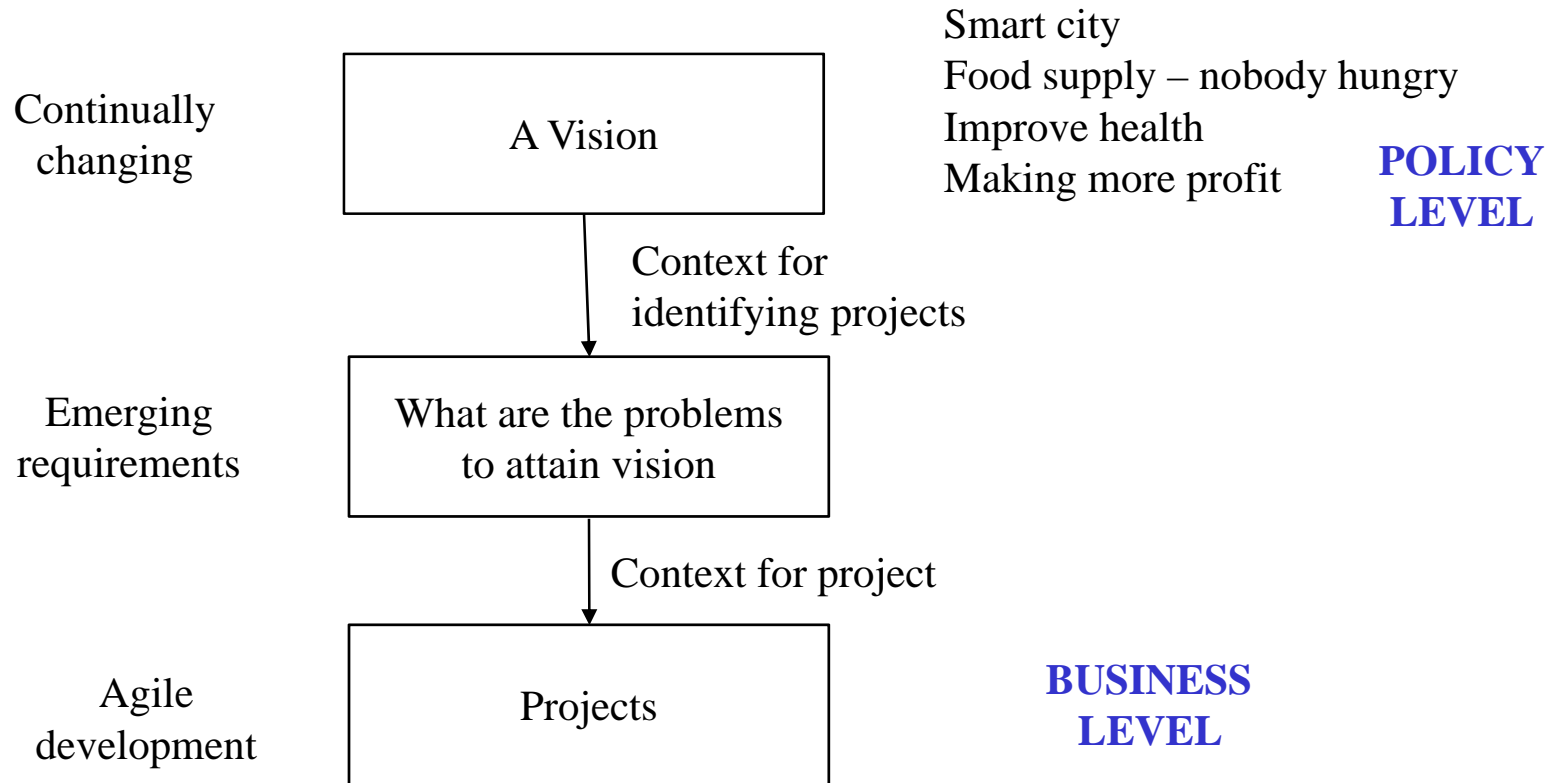
**Continuous and incremental development**

**Need ways to:**

Develop a holistic picture – showing all relationships between systems

Be agile and manage change

# Identifying rather than solving a problem



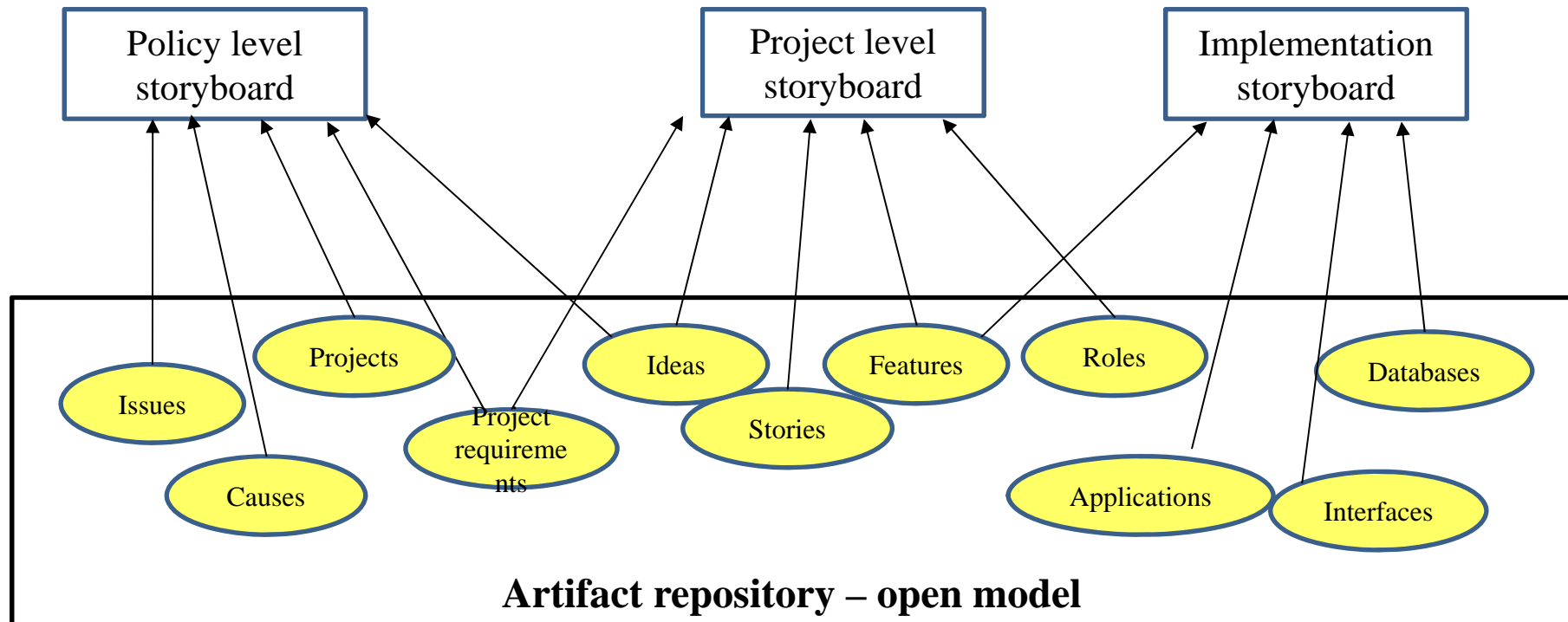
Type 1 – problems and solution agreed on

Type 2 – problem agreed on but solution not clear

Type 3 – there is no agreement on problem or solution

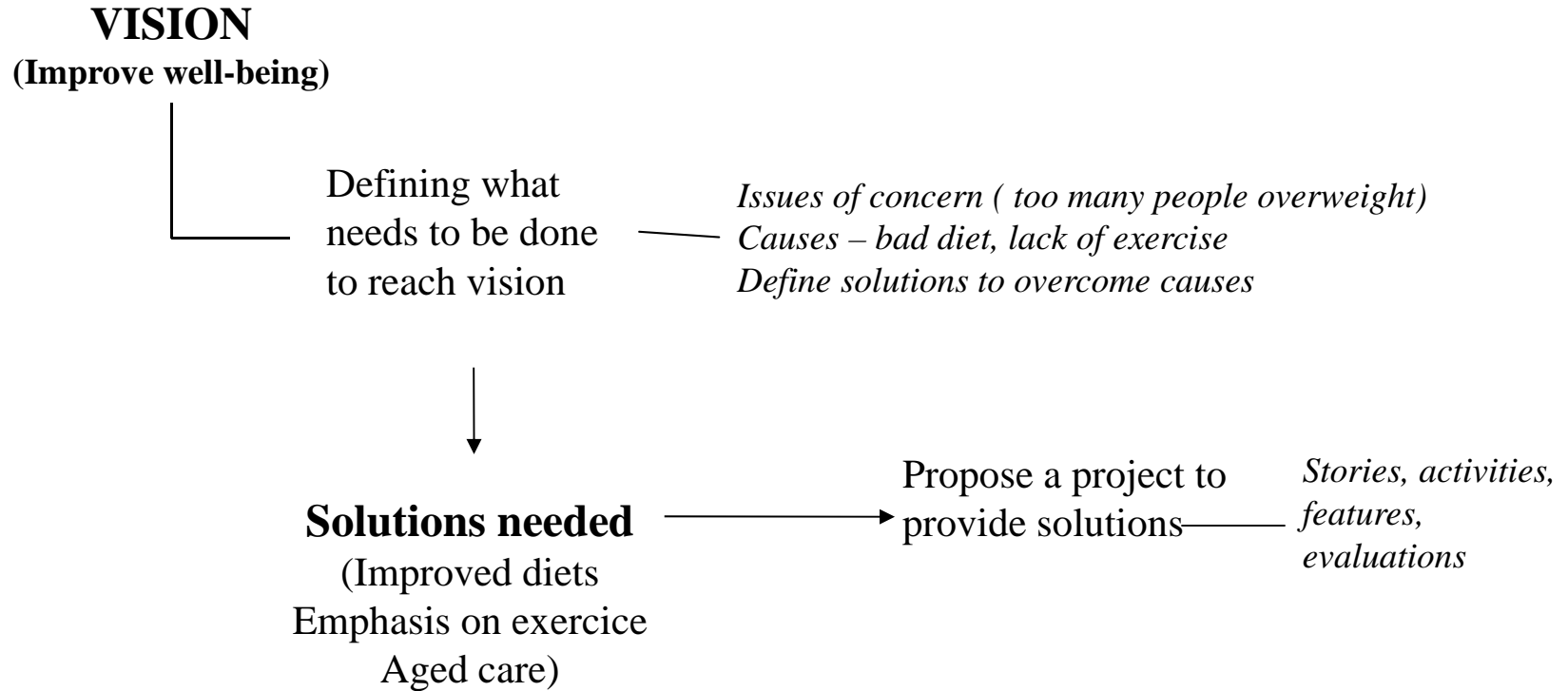
# Requirements by Storyboards

**Story boards to link different levels**





# Vision and problem storyboard



# Focusing on different perspectives at Project Level

Knowledge flow  
Social networking  
Process  
Technology

Need a language to define the structure and the operations

Integrate social and system structure

Multi disciplinary and holistic

# MeLCa for Complex Organisation

In multi stakeholder collaboration

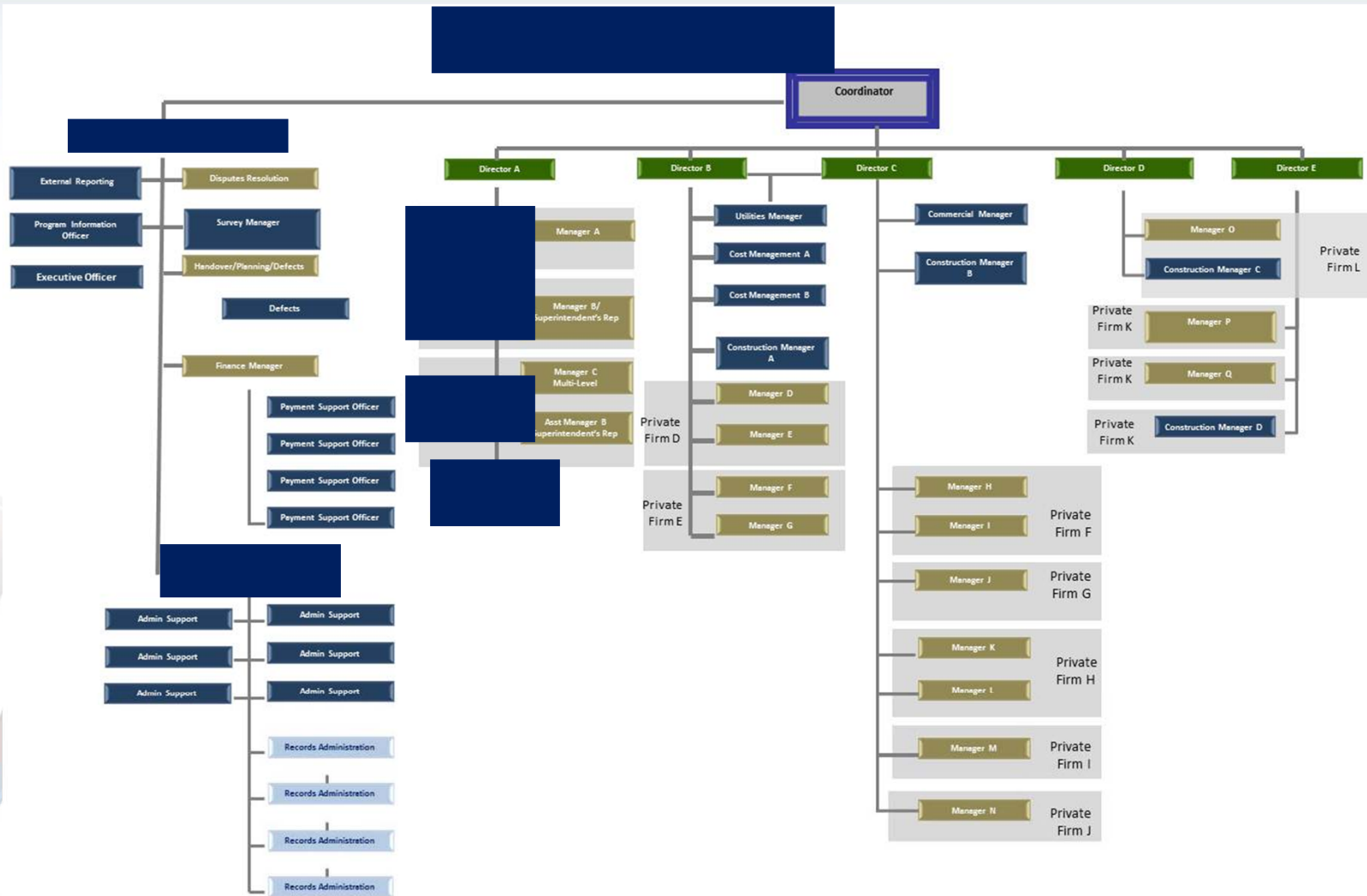
- Organisation perspective
- Business perspective
- Knowledge perspective
- Enterprise Social perspective

# Problems

## A State Government Structure

- › Collaboration with multiple stakeholders – Highlighted with Grey colour
- › Dedicated Managers for each Private Firm to coordinate the projects
- › Projects involved with around 300 internal & 400 external staff
- › Faced with policy/governance/coordination issues
- › Faced with record management issues
- › Faced with information sharing and managing knowledge issues

# A State Government Structure



# System characteristics

**Group** – deals with one or two activities – decisions are simple. Carries out well defined activities.

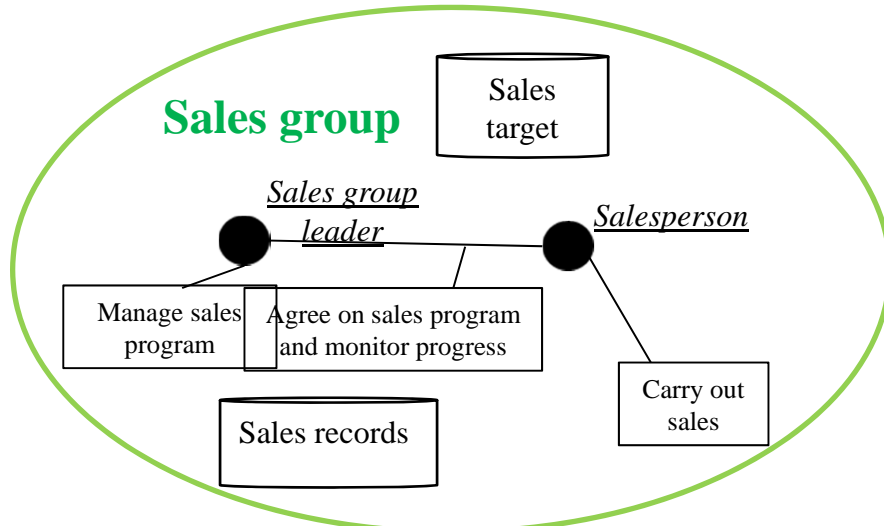
**Organization** – can coordinate a number of groups – has multiple decisions – can contain groups or other organizations

**Community** – a loose connection of people or systems with common goals and rules of behavior.

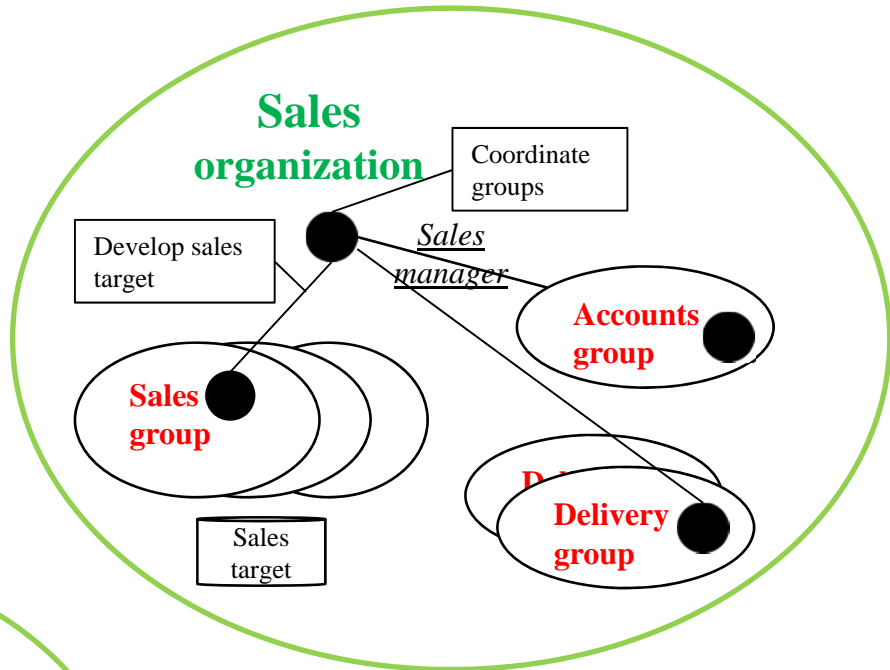
Organizations can be part of a community. They can also include a community, For example academics in a University.

Business or Enterprise – is made up of many organizations or groups..

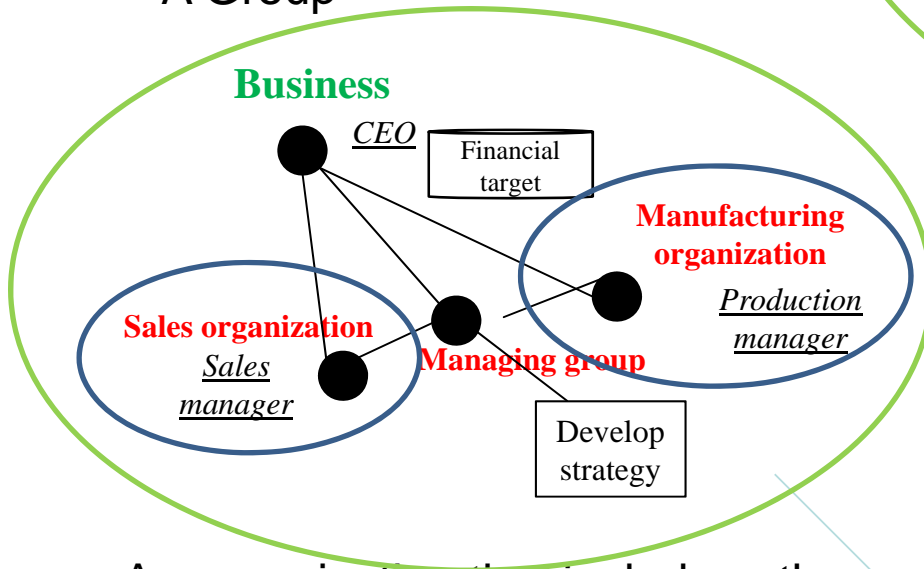
# Simple example – a group



A Group



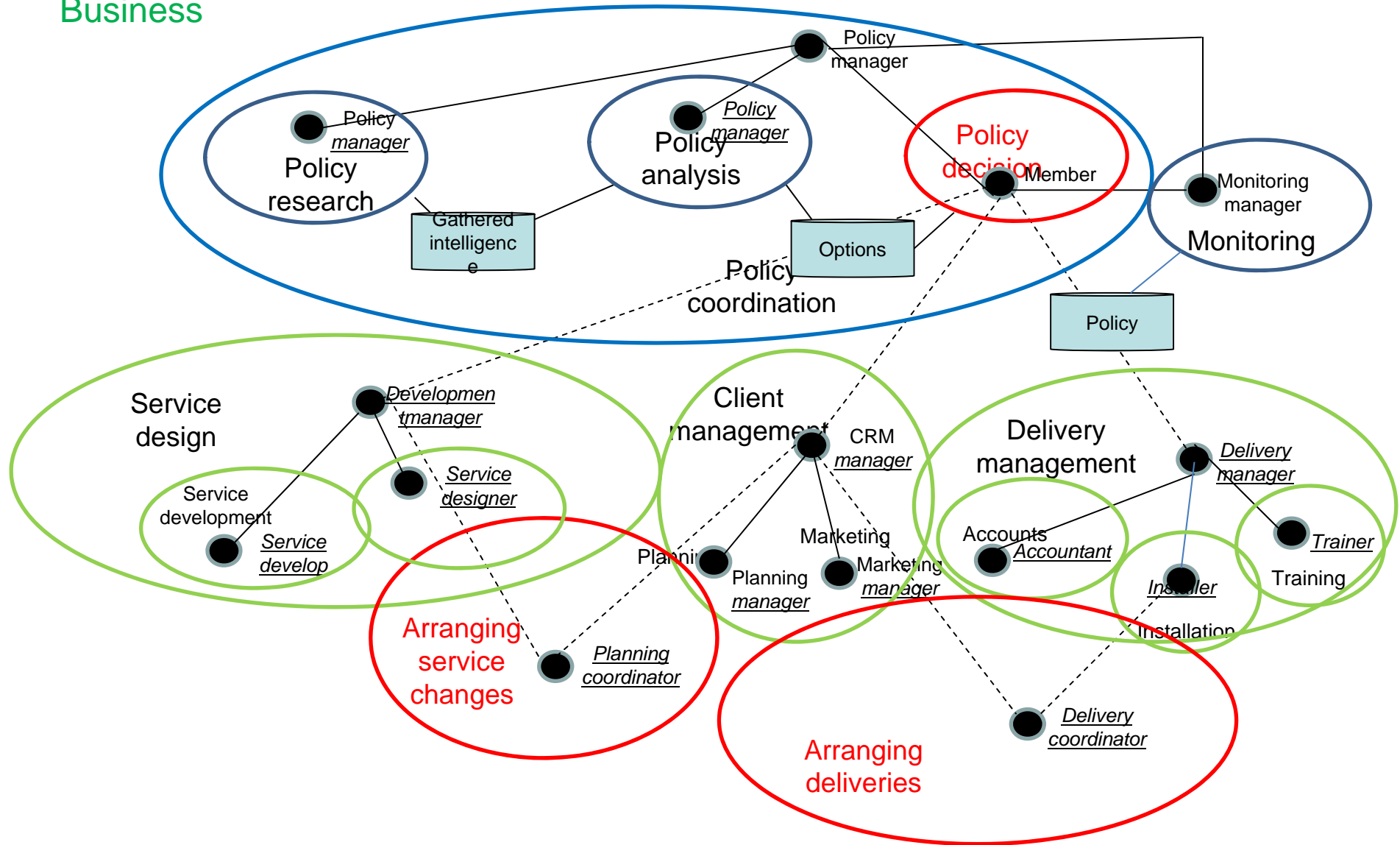
An organization



An organization that includes other organizations

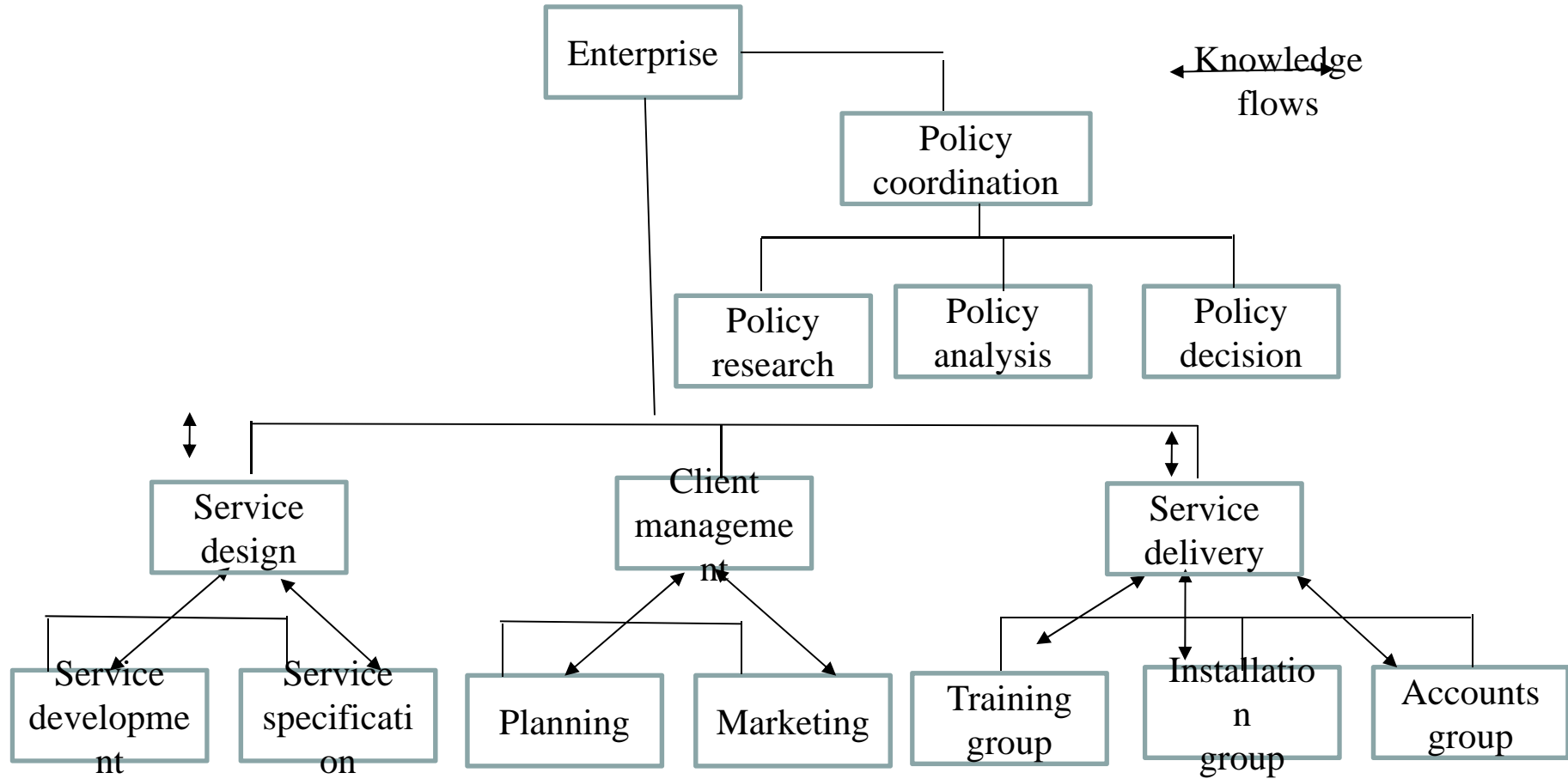
# A typical business

Business





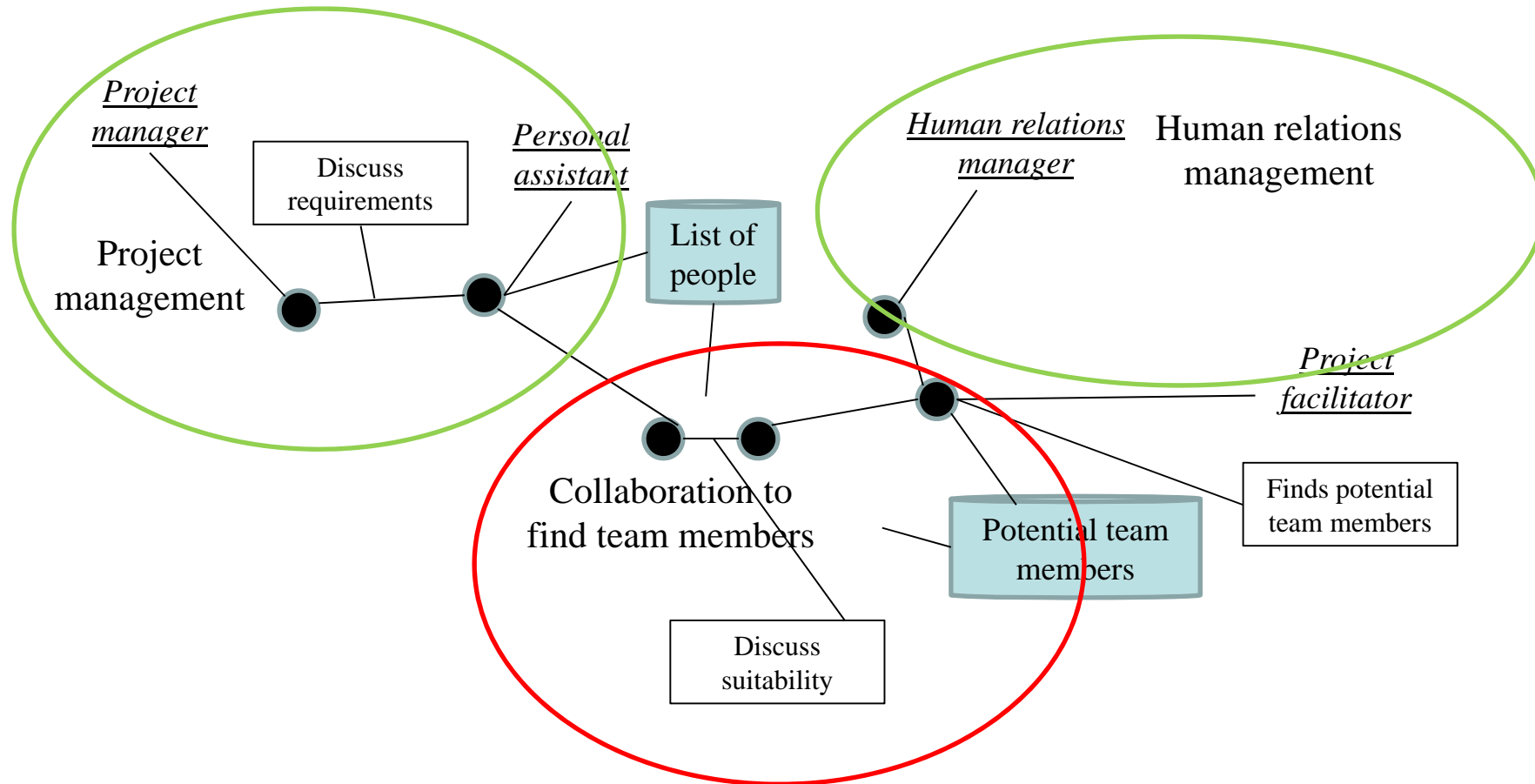
# Equivalent hierarchical



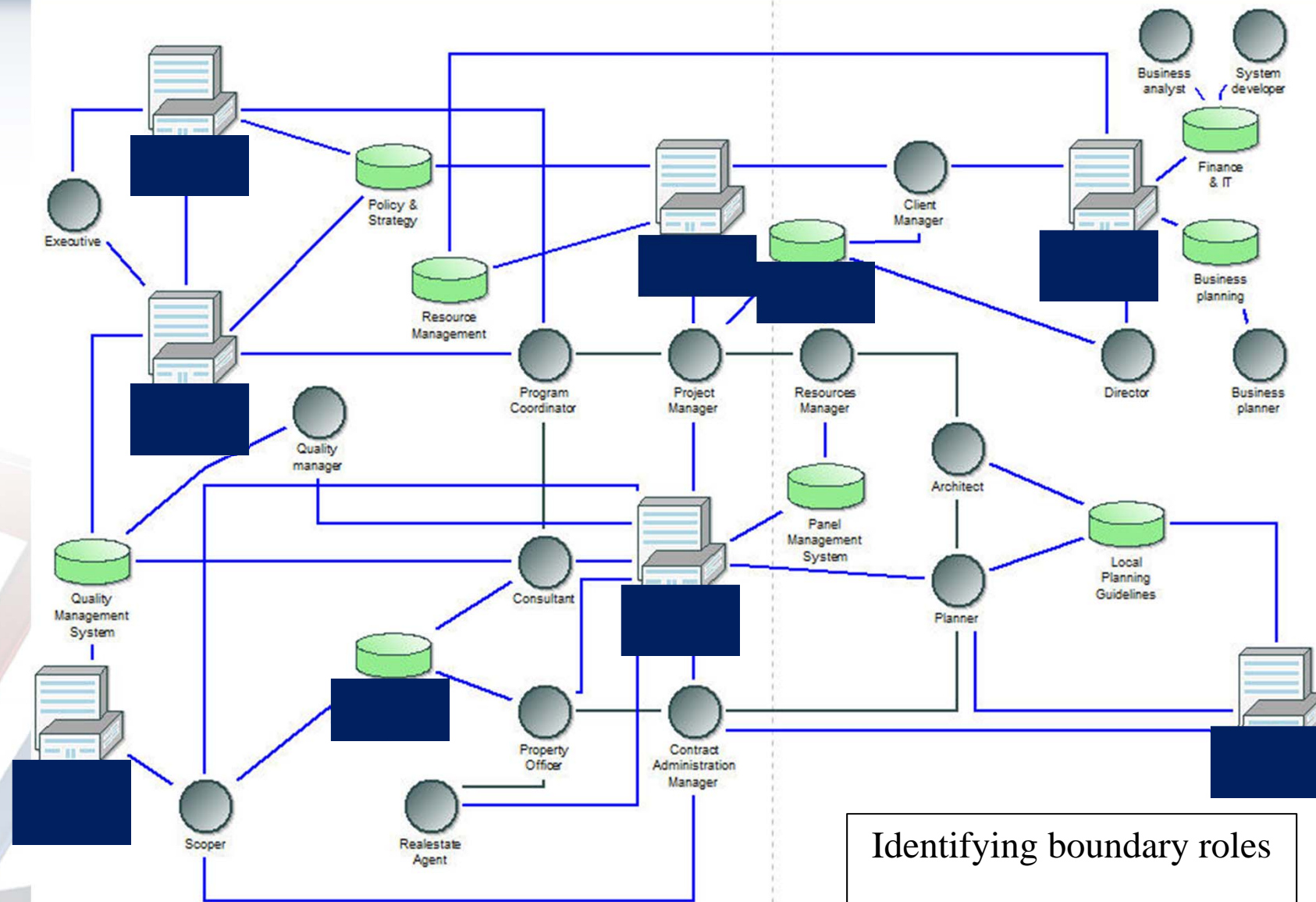
# Coordination through collaboration

Main Language concepts

**Roles, activities, artifacts, interactions**

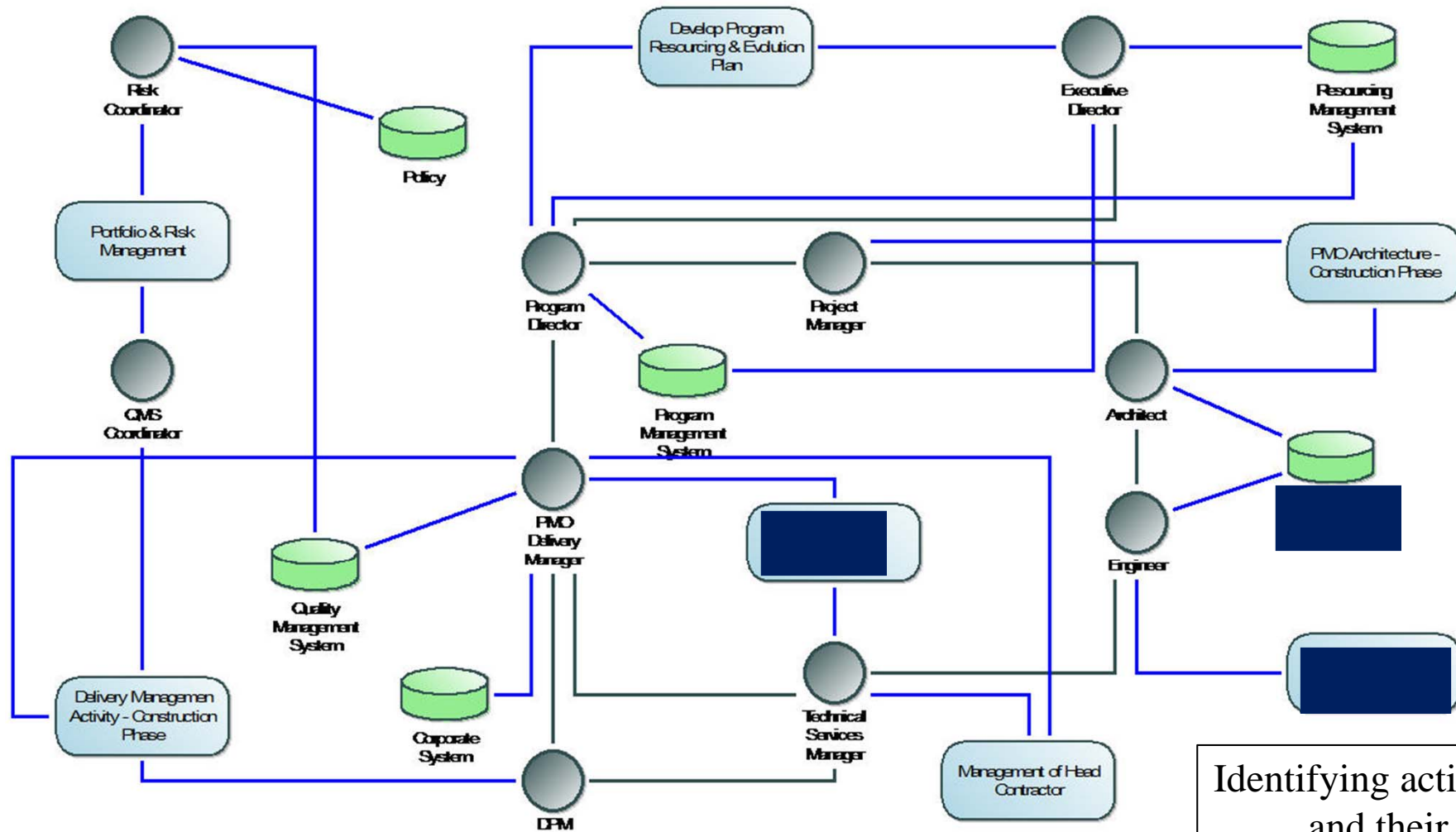


# Organisational Perspective



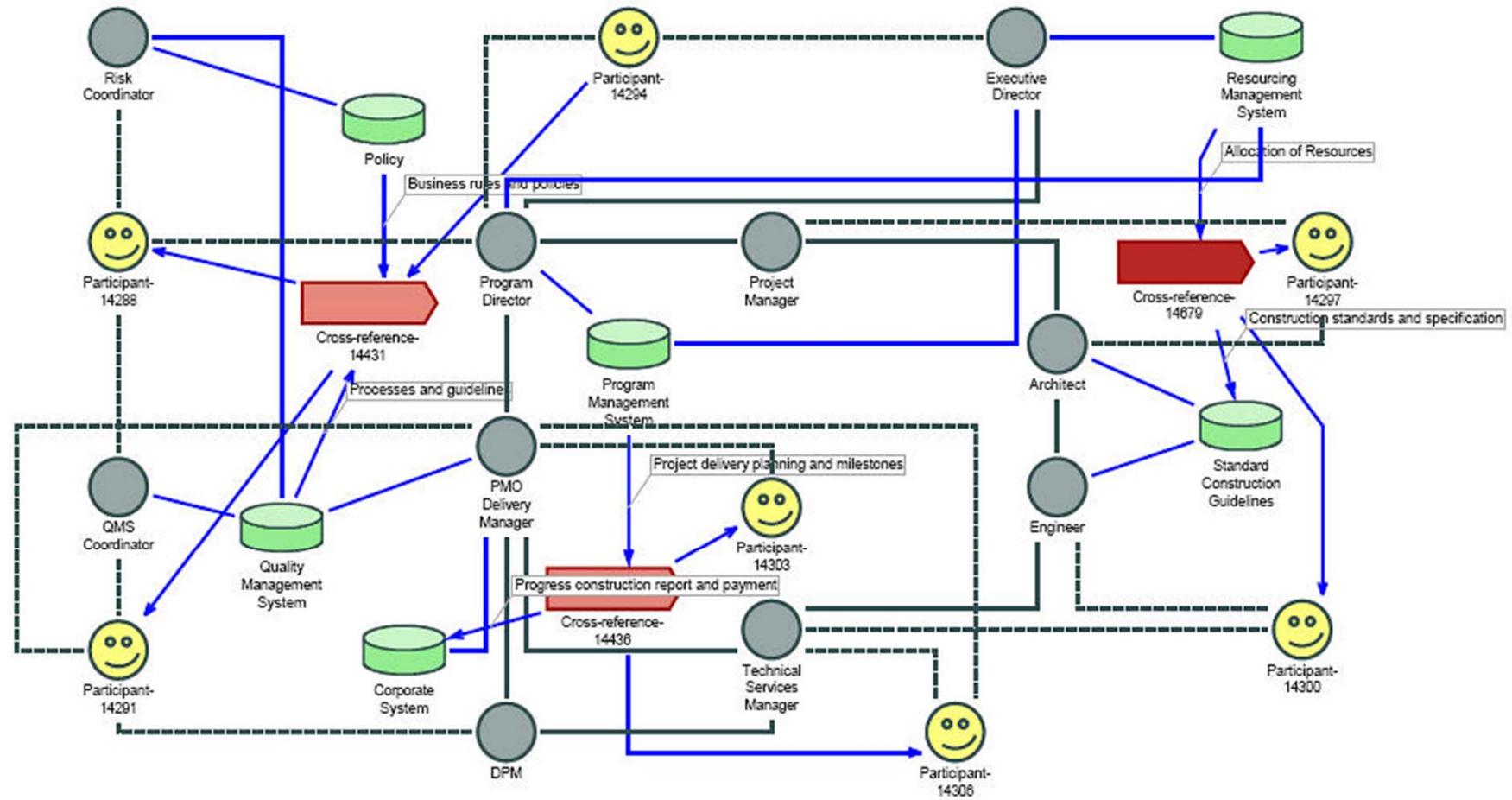
Identifying boundary roles

# Activities

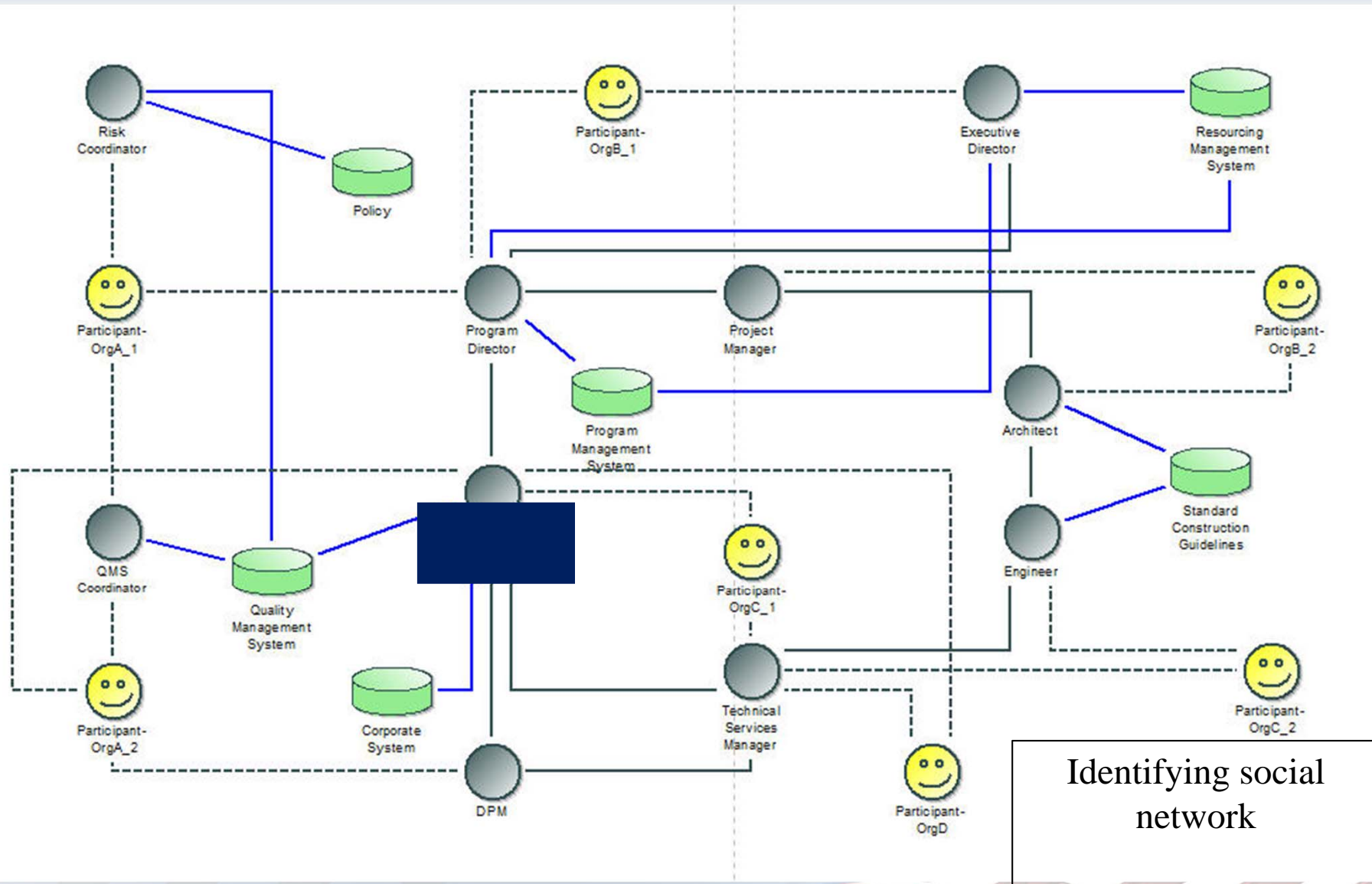


Identifying activities and their information needs

# Knowledge

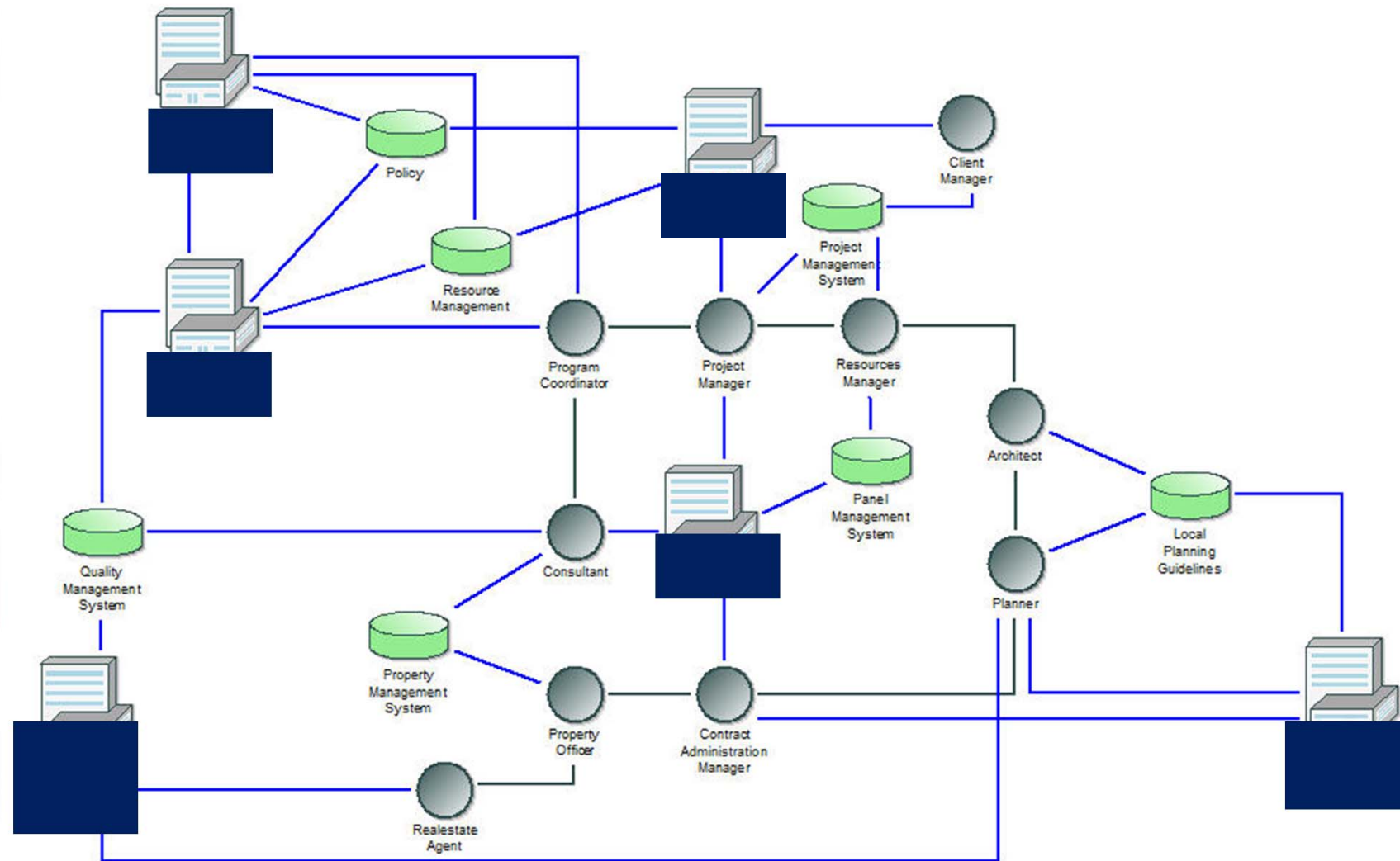


# Enterprise Social

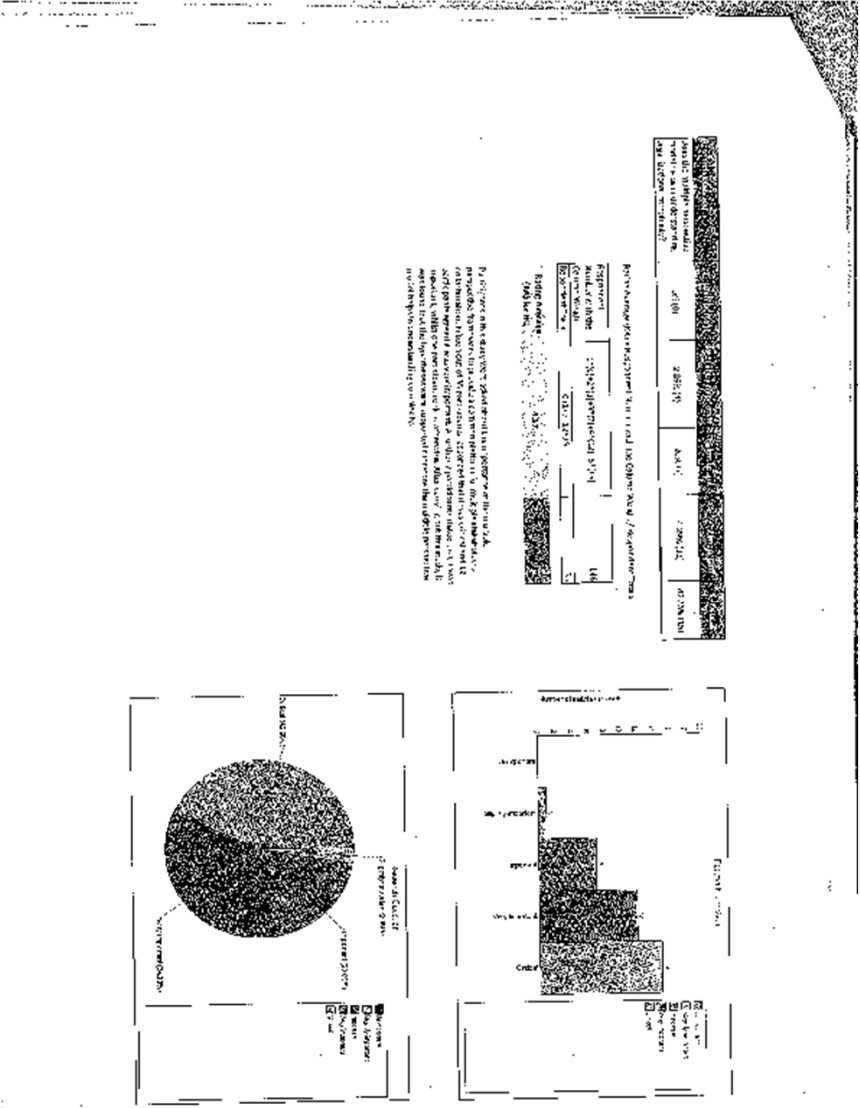




# Multiple Collaboration

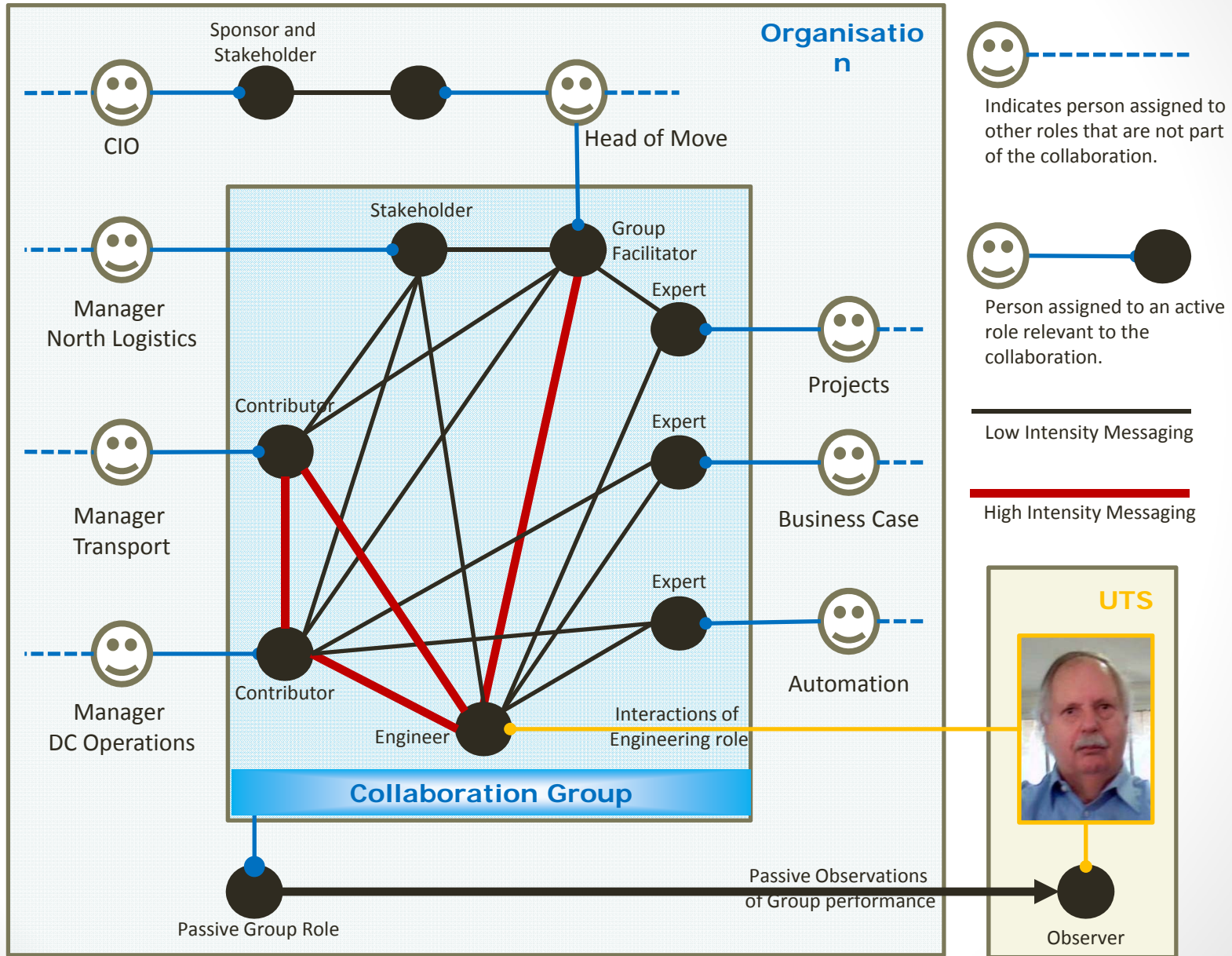


# Finding good perspectives

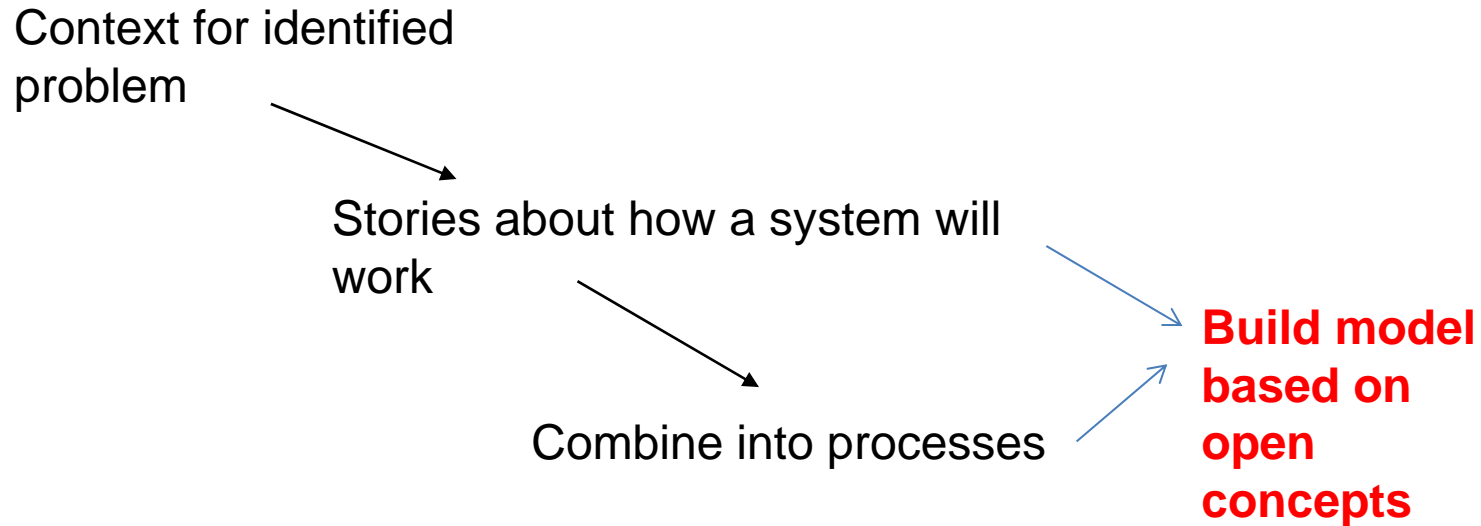




# Another Project Enterprise Social Network: XXX Case Study Collaboration



# Integrating into agile development

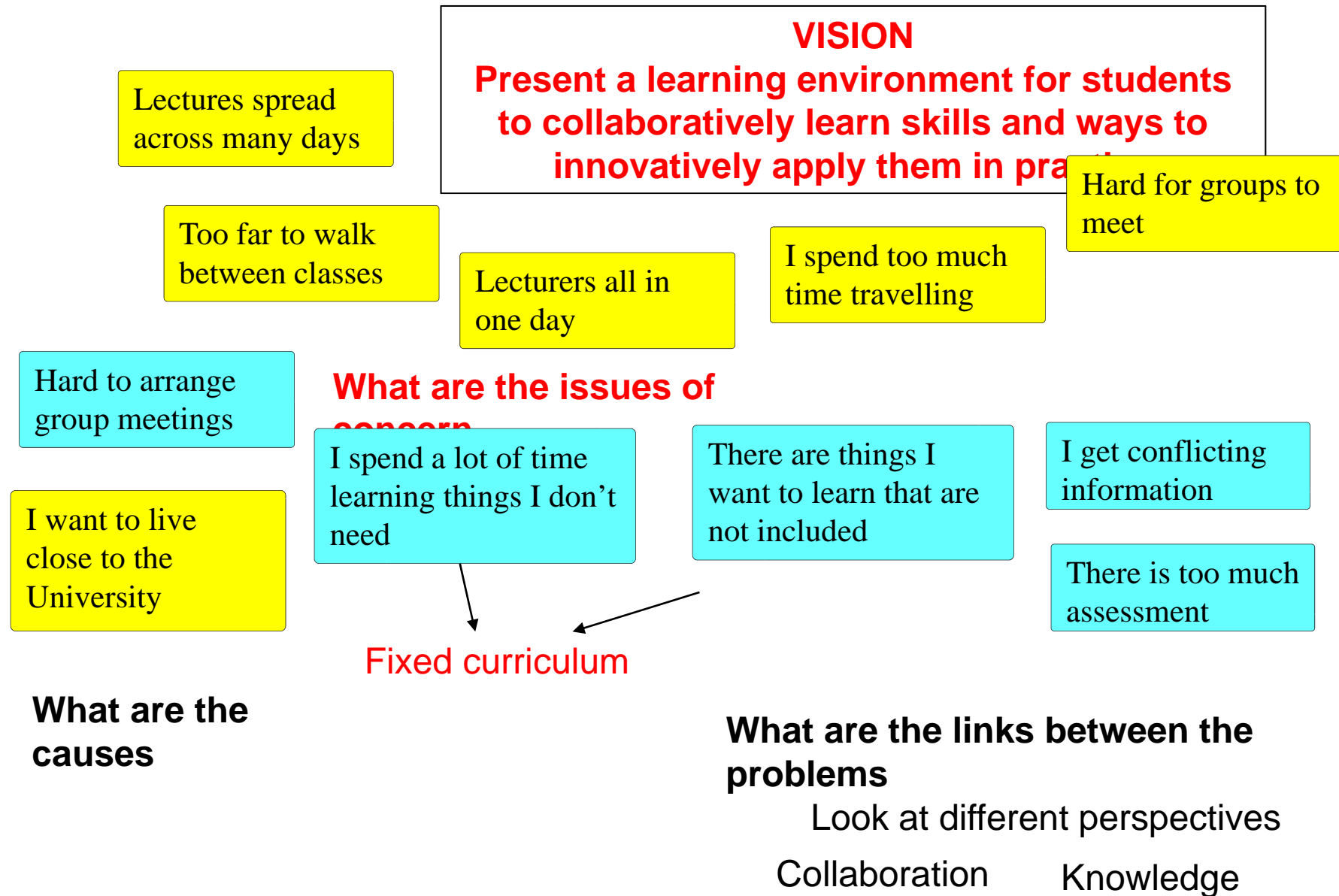


## **IMPORTANCE OF STORIES**

Stories are a way of describing problems and ways to solve them

Combining stories gives an idea of what needs to be done

# Stories for identifying issues (Smart Campus)



# The release plan



Click on Tools, Comment and Share to access additional features.



Click on Tools, Comment and Share to access additional features.



# Stand up



Click on Tools, Comment and Share to access additional features.

# Innovation and FedEx Days



CBP Assignment 1 coming at you! :)  
Tags: group collaboration digital innovation

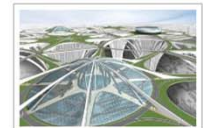
Tags: group

CBP Group  
Tags: group collaboration innovation

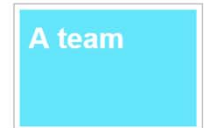
Tags: group



Innoworks 4 life!  
Tags: group



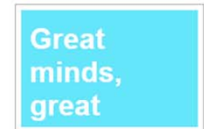
Intellicity  
Tags: group collaboration innovation



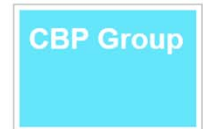
A team  
Tags: group business innovation



Oceans Five  
Tags: group



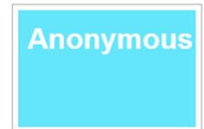
Great minds, great ideas :p  
Tags: group



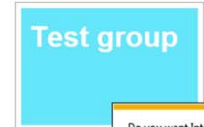
CBP Group  
A group to evaluate the various ideas generated amongst its members.  
Tags: group collaboration innovation



The Team  
David Ascic, John Lau, Lin Lin, Jeremy Lee & Will Chivers  
Tags: group collaboration innovation



Anonymous  
Tags: group



IGOR HAWRYSZKIEWICZ

NEWS FEED

- Sojen Pradhan added an idea to the group
- James Hornitzky added a post to the wall Potential bug :
- James Hornitzky added an idea to the group
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- James Hornitzky updated an idea Trello is a really
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ADMIN SHOW / HIDE

Do you want Internet Explorer to remember the password for uts.edu.au? Why am I seeing this? Yes No

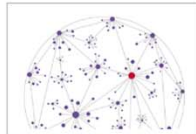
+ ADD IDEA



### Interactive Traffic Lights with Mobile Devices (Pedestrians)

Posted by David Asic  
Pedestrians walking around the Sydney CBD, can utilise their mobile devices, to input their walking routes, which will provide a live stream of all pedestrian "traffic", to assist crossings/traffic.

Tags: idea collaboration digital innovation software



### Living City Sensors

Posted by David Asic  
Upwards of thousands of unique sensors all around the city, measuring air quality, seismic movements, wind direction, etc, creating a 'nervous system' for the city, uploaded to Head Office & ...

Tags: idea



### Pedestrian Lane Markings

Posted by William Chivers  
Footpaths marked with designated 'lanes' for those who walk at different paces, i.e. a slow lane and fast lane.

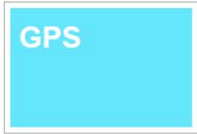
Tags: idea business fitness health humanities



### Central Surveillance System

Posted by David Asic  
A central surveillance system which allows 24/7 live coverage of public areas, assisting with all road and side walk incidents, providing a safer city for the community.

Tags: idea collaboration digital innovation



### GPS

Posted by Li Lin  
GPS is not only can show where the bus is and tell the next stop the bus is coming. It also can report the accident to bus dispatch center.

Tags: idea



### Group security response alert

Posted by Jeremy Lee  
Real time public responses to individuals in distress before police or security personnel are able to aid a person in trouble. This advances the past notions of neighbourhood watch to a new level.

Tags: idea collaboration humanities innovation



### Intelligence Traffic System

Posted by Li Lin  
the integration of all good idea about the promotion of public transportation

Tags: idea



### Real time public transport tracker

Posted by Jeremy Lee  
Instant up the second public transport timings, along with community alerts from users of public transport to possible delays and problems.

Tags: idea collaboration

### NEWS FEED

+ NEW IDEA

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*Potential bug.*

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*testing comment*

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ADMIN

SHOW / HIDE



### Interactive Traffic Lights With Mobile Devices (Pedestrians)

Updated 2012-09-04 20:17:06

MISSION STORYBOARD EVALUATION WALL



Pedestrians walking around the Sydney CBD, can utilise their mobile devices, to input their walking routes, which will provide a live stream of all pedestrian "traffic", to assist crossings/traffic.

- What is the proposed service?**  
To provide pedestrians with an easy-to-use tool which will assist in traffic light flow when walking from one destination to another, based upon volume and history of use
- Who are the users of the service?**  
Pedestrians, People Driving in the CBD
- What are the artifacts/outcomes produced by service?**  
Mobile Device Application (Android/iPhone/Windows), assist in traffic flows, pedestrian movement logs
- How do you describe the high level process of the service?**  
Service created by Development team in conjunction with City Council. Consumers download and use app. App content managed and maintained by Development team.
- What are the work benefits of the service?**  
Allows pedestrians to arrive at work/appointments/tourist destinations faster by foot, as well as keep the vehicle traffic flowing during times of lower pedestrian flow.
- What are the key business goals?**  
Allow the easiest and fastest possible pedestrian movement for a high volume of participants.
- How will this idea affect the market?**  
It will limit the need for manual pedestrian crosswalks. Allow the entire city to track the flow of movement of pedestrians.
- What are the assumptions around this idea?**  
The majority of users will have a mobile device with 3G/4G internet access. The existing infrastructure will support the new system.
- Who are the stakeholders of the project?**  
Pedestrians. Road users. IT systems management. City Council. Telecommunications Companies.

Edit idea Back to ideas

POSTED BY  
David Ascic

TAGS  
IDEA COLLABORATION DIGITAL INNOVATION SOFTWARE

#### NEWS FEED

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ADMIN SHOW / HIDE

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Updated 2012-09-04 20:17:06

MISSION STORYBOARD EVALUATION WALL Edit Idea Back to Ideas

|              |           |             |          |
|--------------|-----------|-------------|----------|
| ACTIVITIES   | STORIES   | FEATURES    | ROLES    |
| ADD ACTIVITY | ADD STORY | ADD FEATURE | ADD ROLE |

|   |   |   |  |
|---|---|---|--|
| <b>Bus stop locations logged</b><br>David Ascic @ 2012-09-04 14:09:18<br>A0 > R0 S0   | <b>User adds a unique "A -&gt; B -&gt; C" route</b><br>David Ascic @ 2012-09-04 20:09:10<br>S0 >  | <b>Once user uploads an "A -&gt; B" location, they are provided the option to either continue, adding additional destinations (Station -&gt; Cafe -&gt; Work) etc</b><br>David Ascic @ Sep 4 2012<br>F0 > S0                                | <b>Worker: Record train departure times, Work Address</b><br>David Ascic @ Sep 3 2012<br>R0 >                          |
| <b>Station Locations Logged</b><br>David Ascic @ 2012-09-04 14:09:06<br>A1 > R0 A2  | <b>User requests live feed of citywide traffic</b><br>David Ascic @ 2012-09-04 20:09:39<br>S1 > F2  | <b>Application has the "notification" feature, which allows users to use the App to notify them of heavy congestions, breakdowns or other anomalies as they occur, with a vibration or ringtone.</b><br>David Ascic @ Sep 4 2012<br>F1 > S1 | <b>City Government: Analyze records to understand where investment is required</b><br>David Ascic @ Sep 3 2012<br>R1 > |
| <b>Work Addresses Logged</b><br>David Ascic @ 2012-09-04 14:09:58<br>A2 > R0 S0   | <b>User creates their unique ID using the application, using their Licence/Passport/other form of ID as a unique reference</b><br>David Ascic @ 2012-09-04 20:09:13<br>S2 > | <b>Once the user is connected to 3G/4G networks (or WIFI), the application operates in the background on minimal data useage, and refreshes once the user runs the application</b><br>David Ascic @ Sep 4 2012<br>F2 > S1                   | <b>Resident: Monitor ebb and flow of peak periods</b><br>David Ascic @ Sep 3 2012<br>R2 >                              |
| <b>Tourist Destinations Logged</b><br>David Ascic @ 2012-09-04 14:09:50<br>A3 > R3 S0   | <b>Pedestrian leaves train station and enters work address into application</b><br>David Ascic @ 2012-09-04 20:09:30<br>S3 >  | <b>User ID generation follows a simple form, and requires e-mail confirmation for activation</b><br>David Ascic @ Sep 4 2012<br>F3 > S2   | <b>Tourist: View popular destination activity</b><br>David Ascic @ Sep 3 2012<br>R3 >                                  |
| <b>Government requires records of traffic flows, as they wish to commence road works at the most convenient time.</b><br>David Ascic @ 2012-09-04 14:09:08<br>A4 > R2 S0 S5 | <b>User requests the data regarding the population movements across the main road</b><br>David Ascic @ 2012-09-04 20:09:03<br>S4 >  | <b>All submitted "locations" are also able to be viewed in "Street view" combining both GPS functionality</b>   | <b>User: Login to system</b><br>David Ascic @ Aug 7 2012<br>R4 >   |
| <b>Council worker: Alter traffic light rotation</b><br>David Ascic @ 2012-09-04 14:09:24<br>A5 > S6 S5  | <b>Government analyse reports, conduct roadworks during off-peak periods</b><br>David Ascic @ 2012-09-04 20:09:40   |   |  |
| <b>View: Logs of movement</b><br>David Ascic @ 2012-09-04 14:09:05<br>A6 > R2 R3 S4   |   |   |  |

#### NEWS FEED

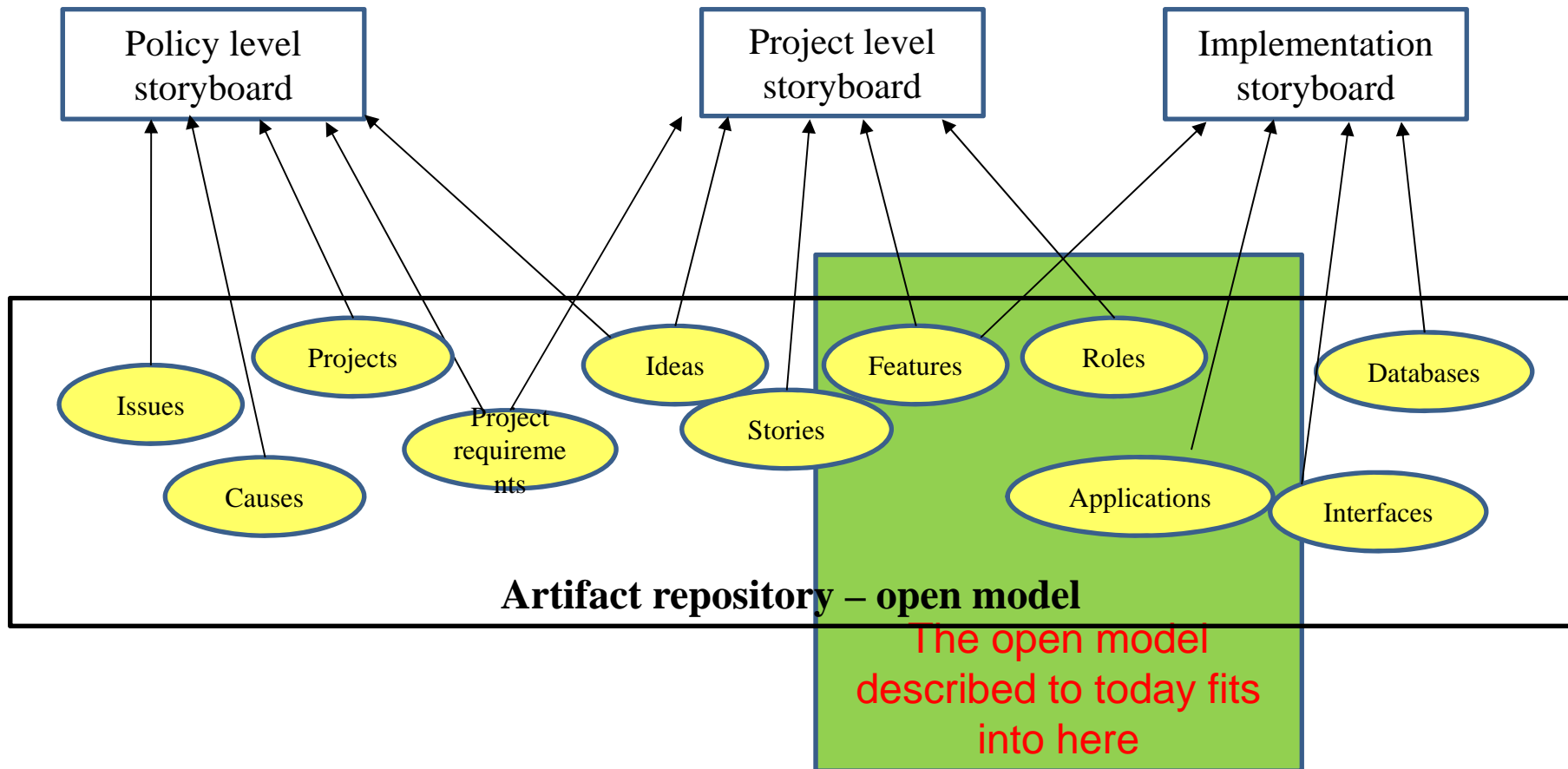
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ADMIN

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# Current development

## Story boards to link different levels



# Described in new eBook

The screenshot shows a web browser window displaying the Amazon.com product page for the Kindle edition of the book "Agile Business System Design: Using Information Technology to create business value" by Igor T. Hawryszkiewicz. The browser's address bar shows the URL "http://www.amazon.com/Agile-Business-Syster...". The Amazon logo is visible in the top left, and navigation links like "Your Amazon.com", "Today's Deals", "Gift Cards", and "Help" are present. A search bar is located in the top center, and a shopping cart icon is in the top right. The main content area features the book cover on the left, which includes the text "Click to LOOK INSIDE!", "AGILE BUSINESS SYSTEM DESIGN", "Using Information Technology to create Business Value", and "IGOR T. HAWRYSZKIEWYCZ". To the right of the cover, the book title and author name are displayed, along with a "Like" button and a "Be the first to review this item" prompt. The Kindle price is listed as \$7.99, including free international wireless delivery via Amazon Whispernet. Below the price, there are two bullet points: "Length: 121 pages (estimated)" and "Don't have a Kindle? Get your Kindle here." On the right side of the page, there are two green promotional boxes. The top one contains a "Buy now with 1-Click" button, a "Deliver to your Kindle or other device" section, a "How buying works" link, an "Available on your PC" link, and a "Give as a Gift" button. Below this is an "Add to Wish List" button. The bottom box contains a "Try it free" section with a "Sample the beginning of this book for free" message, a "Send sample now" button, and another "Deliver to your Kindle or other device" section with a "How sampling works" link. The Windows taskbar at the bottom shows the time as 11:20 PM and includes icons for the Start menu, file explorer, and the browser.

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Click to **LOOK INSIDE!**

**AGILE BUSINESS SYSTEM DESIGN**

Using Information Technology to create Business Value

IGOR T. HAWRYSZKIEWYCZ

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[Igor T. Hawryszkiewicz](#) (Author)

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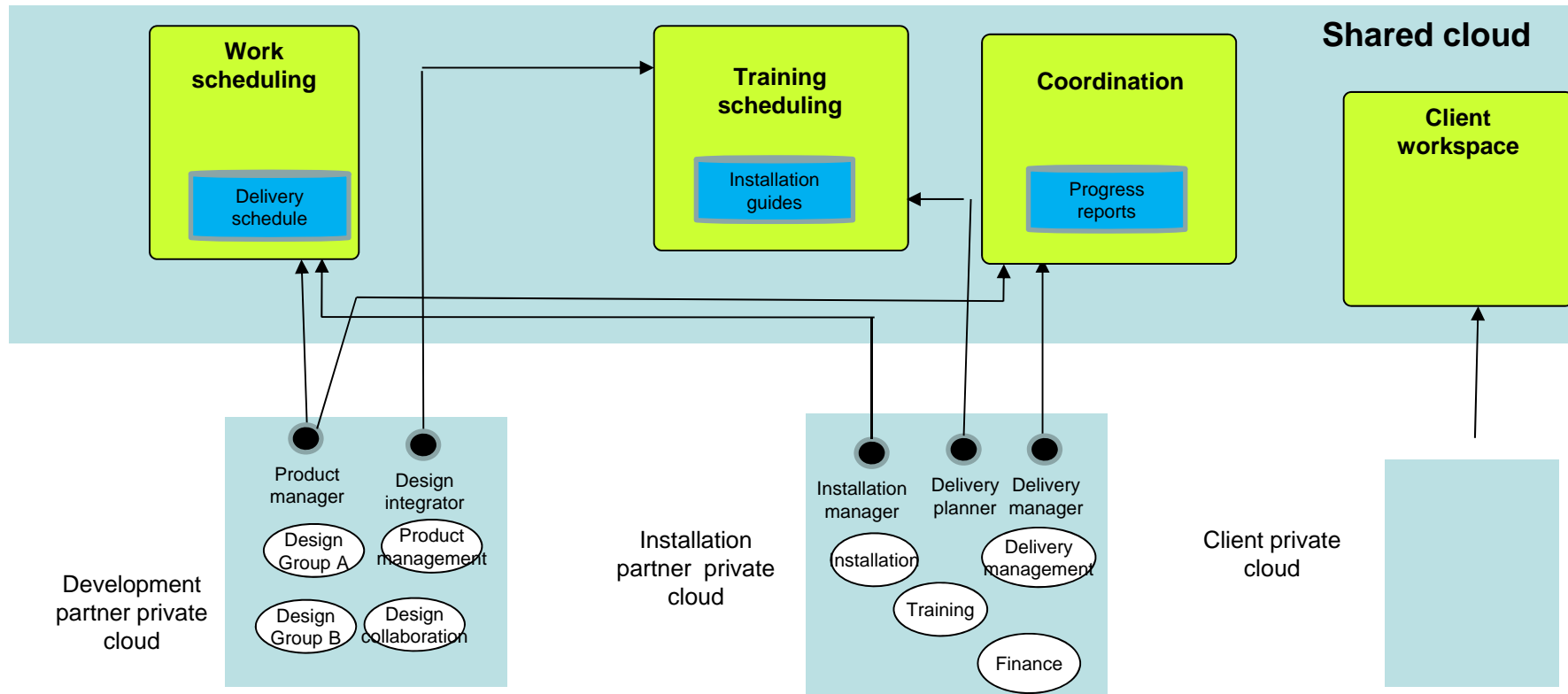
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# Modeling system of systems in partner collaboration



# SUMMARY AND FUTURE WORK

Why are open system methods needed

Defined a set of open concepts for collaboration

Illustrated by an example for analysis

**Integration into agile development**

**Need support for dynamic concepts formation**