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# Understanding Systems in a Business Context

## Investigative Architecture

Open Group Conference, San Francisco | 01 Feb 2012

Presenter: Dan Hughes (@systemsflow)

*Strategic thinking.*
*Practical application.*

# Abstract

A foundational skill for an architect is the capability to rapidly assess and document "as is" and proposed architecture and communicate clearly to business partners. A carefully scoped and formatted diagram is a powerful vehicle for clear communication. A specific diagram - the system context view - provides a rapid method to describe a solution in business language. This instructional session presents concrete techniques and structured rules of thumb to guide the development of business context views at both the enterprise and solution level. We will walk through a case study in order to illustrate the techniques, and present strategies to map to and from other types of views within Systems Flow's core set of "Investigative Architecture" diagrams, which we presented at previous Open Group conferences.





# The Challenge

- Enterprise knowledge regarding systems is usually in a sorry state
  - Disparate information sources
  - All levels of quality and completeness
- Architects are charged with untangling this mess
  - If not explicitly, than as a pre-requisite for delivering new solution architectures



# Overview

- About Investigative Architecture
- Diagrams of Investigative Architecture
- Investigative Architecture Process
- System Context Diagram Overview
- Case Study
- Questions

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# What is Investigative Architecture?

- A repeatable, structured approach for
  - gathering information from
    - internal stakeholders and documents, and
    - external information sources; and
  - capturing that information in a clear, concise format
    - to clarify for yourself, and
    - communicate to others.



# A simpler explanation…

Investigative Architecture is clarifying and confirming system architectures by:

1. Finding the information you need
2. Interviewing others to fill any gaps
3. Delivering clear diagrams of those architectures

Very, very quickly!

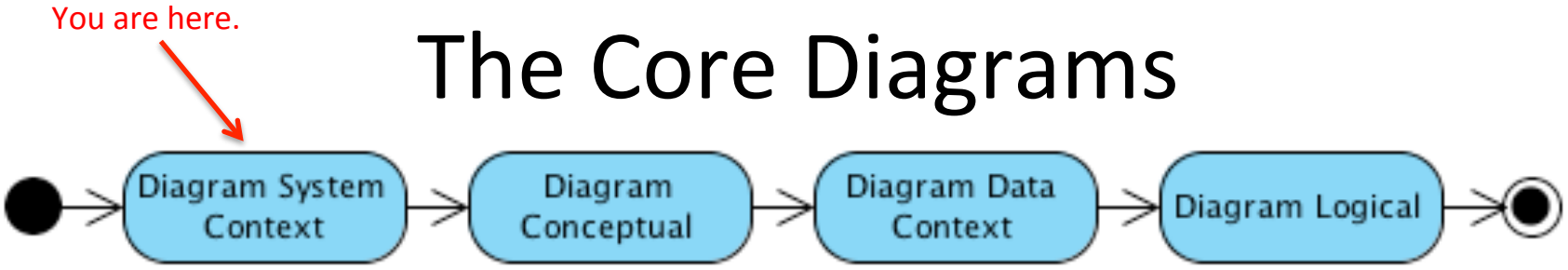


# Tenets of Investigative Architecture

- Always start with a diagram. It's all about the diagram!
- Iterate rapidly and frequently. It accelerates convergence.
- Take any information you can get. You never know where your next clue will be found.

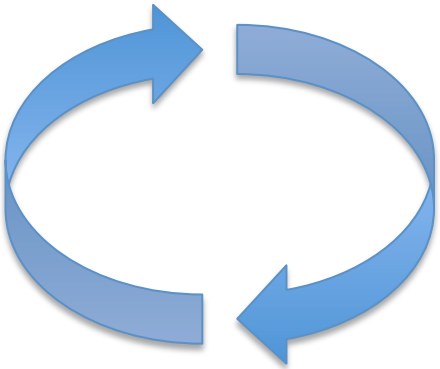


# The Core Diagrams




- Who uses the system and what do they do with it?
  **| Functional View**

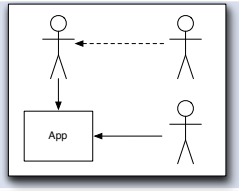
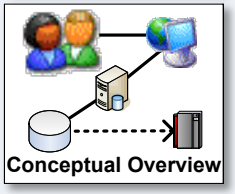
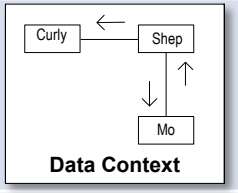
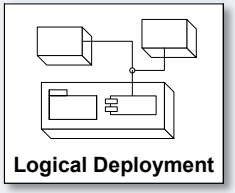
- How is the system architected?
  **| "mArchitecture" View**



- Where does the system integrate with other systems?
  **| Data Integration View**

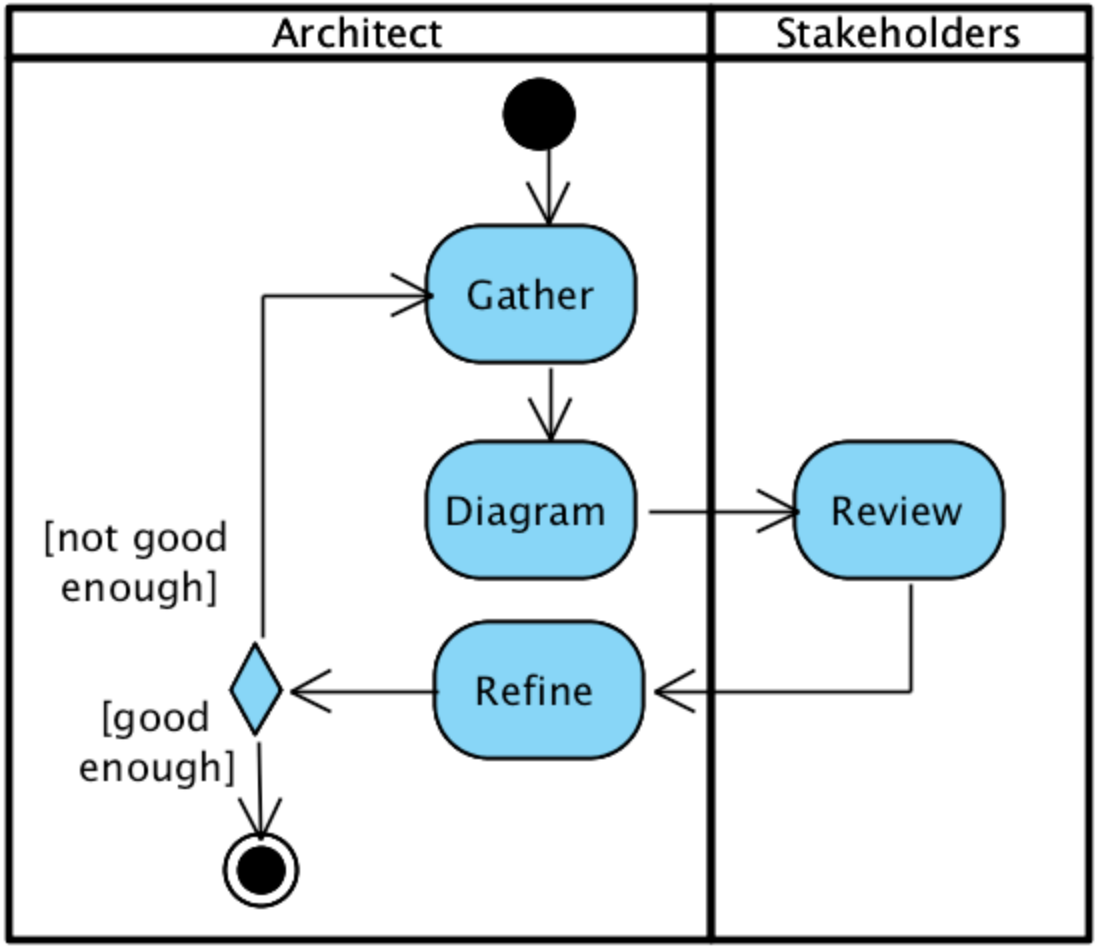
- How do the architecture components integrate?
  **| Systems View**

# About the Core Diagrams

| Diagram | Description |
|---|---|
| System Context   | A very high level view of a system that depicts the system as a black box and captures the actors outside the system and their interactions with it. |
| Conceptual   | A conceptual level view of the architecture for the Powerpoint crowd; almost “marketecture”. Understandable even to a non-technical reader with no familiarity with the notation used. |
| Data Context   | High level view of external systems with which the target system interfaces and the nature of the data transferred using UML collaboration diagram notation. |
| Logical Deployment   | A logical view of architecturally significant systems, components, and relationships. Provides clear static view of systems involved and their relationships using UML Component diagram notation. |



# The Process



# Information Gathering Tips!

- Keep a razor sharp focus on what you need for your scope
- Read table of contents and introductory section of documents
  - Follow up on anything of interest in TOC
  - Skim documents for diagrams
- Make heavy use of “notes” and question marks on early diagrams
- When you email questions:
  - Provide context
  - Be very specific regarding what information you seek
  - If you ask multiple questions in one email, number them
- Be a pilgrim, not a preacher

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# Typical Information Sources

| Source | Notes | BizCtx | Concept | DataCtx | Logical |
|---|---|---|---|---|---|
| Product Docs | User Guides, Training, Install Guides, Admin Manuals, Marketing Junk | ✔ | ✔ | ✔ | ✔ |
| Intranet | Can be a gold mine! | ✔ | ✔ | ✔ | ✔ |
| Network Docs | Topologies, Physical diagrams | | ✔ | ✔ | ✔ |
| Project Docs : Vision / Biz Case | Typically set systems in a business context | ✔ | ✔ | ✔ | ✔ |
| Systems Operations Books | Run books, recovery procedures | | ✔ | ✔ | ✔ |
| Data Models, ETL Specs | Job schedules, job logs | | | ✔ | |
| Requirements, Functional Specs | Use cases, docs, databases | ✔ | ✔ | ✔ | ✔ |
| EA Repository | Rich Biz and Tech Information (if you are so lucky!) | ✔ | ✔ | ✔ | ✔ |
| Policies / Process Models | Six Sigma, Lean Analysis, Business Operations Manuals | ✔ | | | |



# Source Spelunking Tips

| Source | Notes |
|---|---|
| Product Docs: User Guides / Job Cards / Training Manuals | Expect to find what you need in table of contents or early on in the documentation. |
| Intranet | Can be a rich source of all sorts of information, including information about departments/roles, and systems (from a business perspective. |
| Business Cases / Project Vision Documents | Any depictions of current or target states can be helpful for understanding stakeholders and capabilities. |
| Organizational Charts / Employee Profiles | Useful for understanding department roles and converting names to roles. |
| Requirement Documents / Functional Specifications | Look for high level information like Use Cases. |
| Business Process Diagrams | Useful for stakeholder identification and understanding high level functional needs. |
| Google! (if “off the shelf” products) | Product marketing material will frequently target roles and high level capabilities. |
| Stakeholder Interviews | Phone, email, or face to face. Ask “who uses/needs to use this system” and “what do they use it for.” |



# Interviewing Tips

- Introduce your goal and share any views you have already produced (even drafts!)
- Prompt for any questions you have
- Ask for anything else they know about the users or system
- Ask for leads on others that might be able to answer any questions they are not
- Ask for leads on others with whom you would need to review the architecture to ensure you have a complete and accurate view



# Typical People “in the know”

| Source | Notes | BizCtx | Concept | DataCtx | Logical |
|---|---|---|---|---|---|
| Department “Ops” | Policies, Processes | ✔ | | | |
| System Power Users | Product Manuals, Training | ✔ | ✔ | ✔ | |
| Support Teams | Product manuals, Physical diagrams, Operations stuff | ✔ | ✔ | ✔ | ✔ |
| Project Resources | Project docs, PMO/ Change control stuff | ✔ | ✔ | ✔ | ✔ |
| Network Engineers | Network info, topologies | | ✔ | ✔ | ✔ |
| Enterprise Architects | | ✔ | ✔ | ✔ | ✔ |
| Solution/Application Architect | | ✔ | ✔ | ✔ | ✔ |
| Vendor | | ✔ | ✔ | ✔ | ✔ |

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# General Diagram Reviewing Tips

- Describe the diagrams as representing “your current understanding” to make it clear you are not threatened by feedback
- Refer to it as “the” architecture, not “my” architecture
- Be open and grateful for feedback
- Start by providing a quick refresher on the notation

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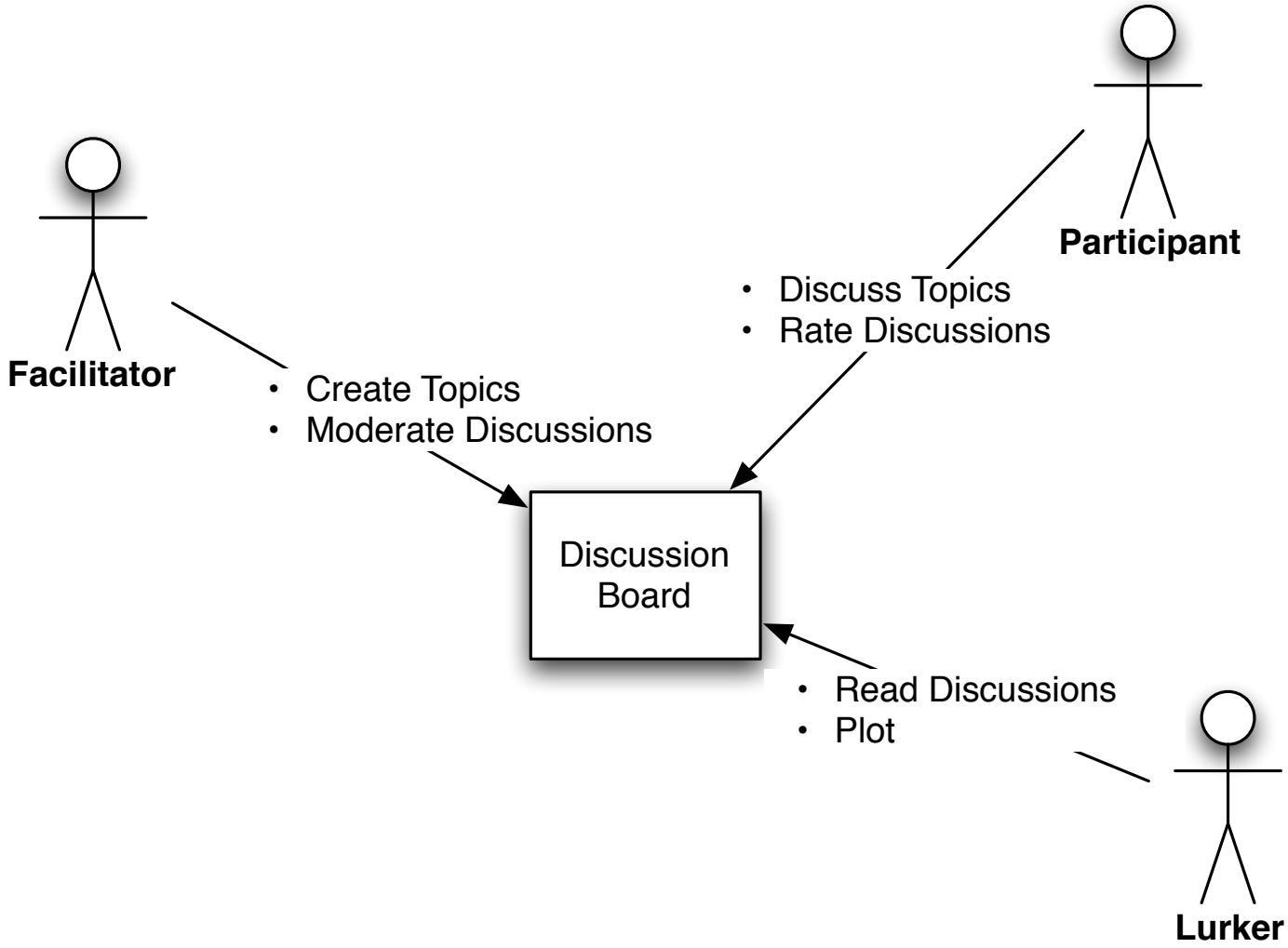
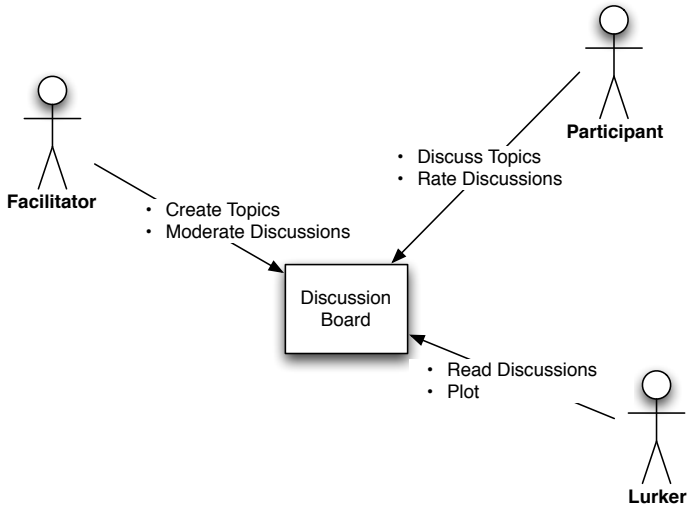
# The System Context Diagram



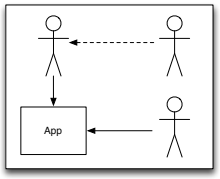
# The System Context Diagram

A very high level view of a system that depicts the system as a black box and captures the actors outside the system and their interactions with it.

- Defines a system by identifying how external entities will interact with it
- Shows the system in a business driven context – its role supporting business activities
- Is very understandable to even the most technology challenged audience
- Catalogs a system's high level capabilities or Use Cases



# The System Context Diagram (more)




**Base Notation:** System Context Notation (Kossiakoff, 2003)
**Audience:** Anyone - Entry Level to Executive, Business and Technology

| Timing | Situation |
| --- | --- |
| **Current State Architectures**<br>Typically done early or first! | **Current State Architectures**<br>• Extract system purpose from business users.<br>• Identifying system stakeholders. |
| **Proposed Architectures**<br>Used early in the solution definition process. | **Proposed Architectures**<br>• Clarifying functional scope of a system.<br>• Clarifying system stakeholders.<br>• Identifying system capabilities. |

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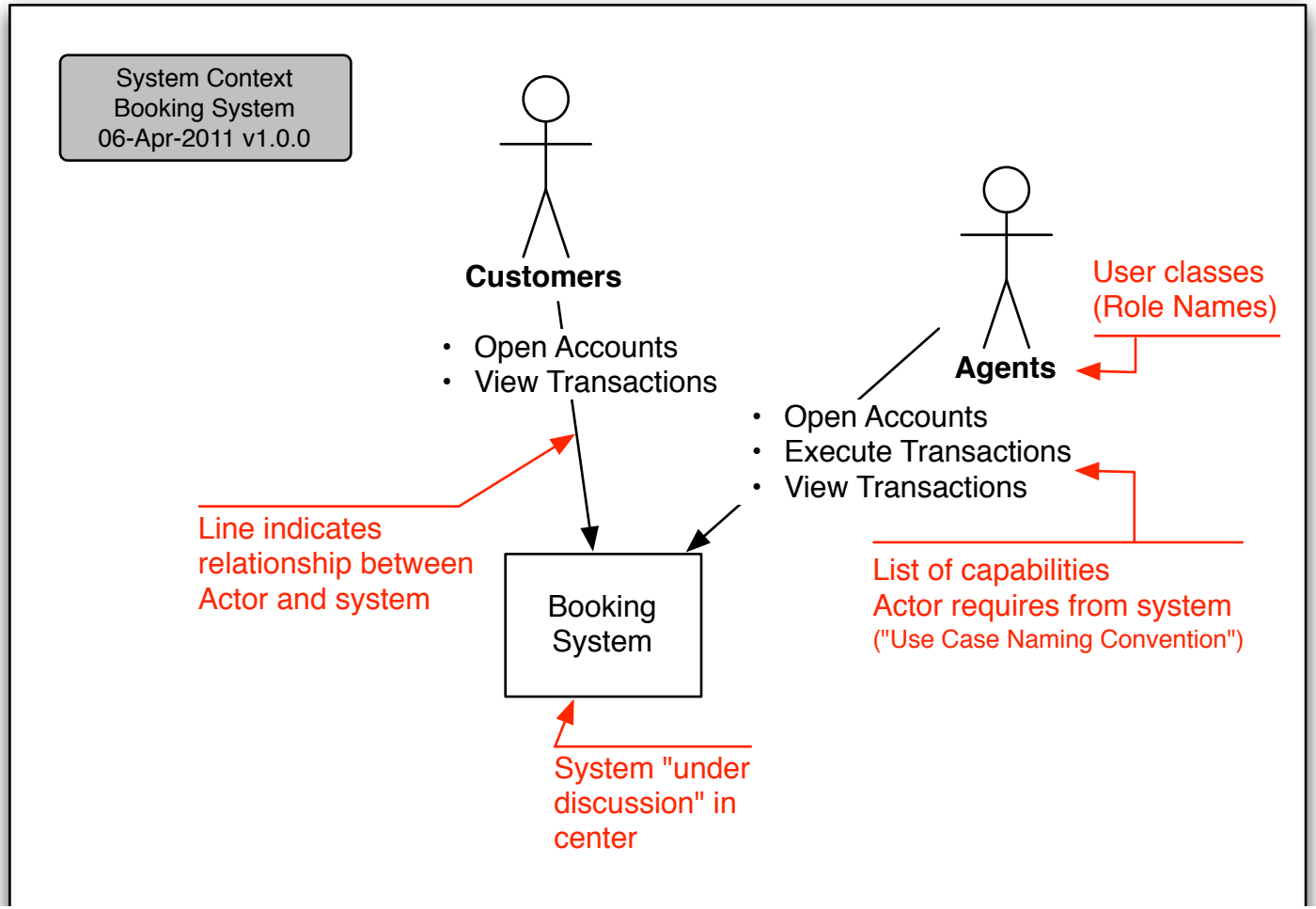
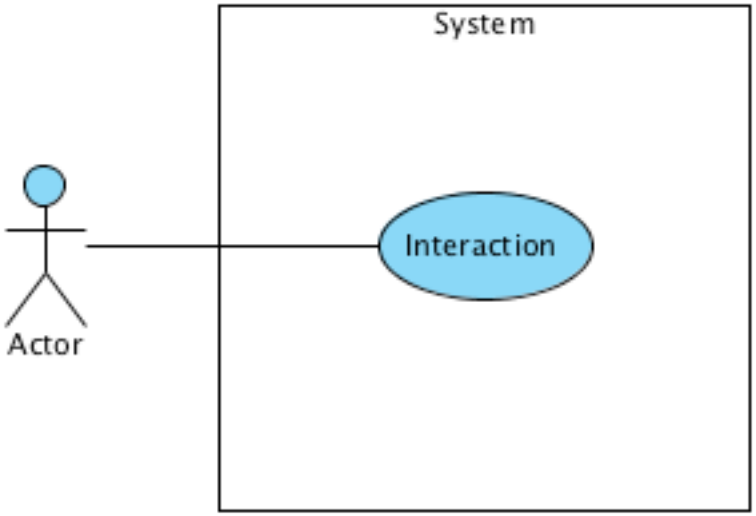
# Notation "Quick Start"



# Why not use UML Use Case Diagram?




Pro

- Uses our preferred notation (with all associated benefits)

Con

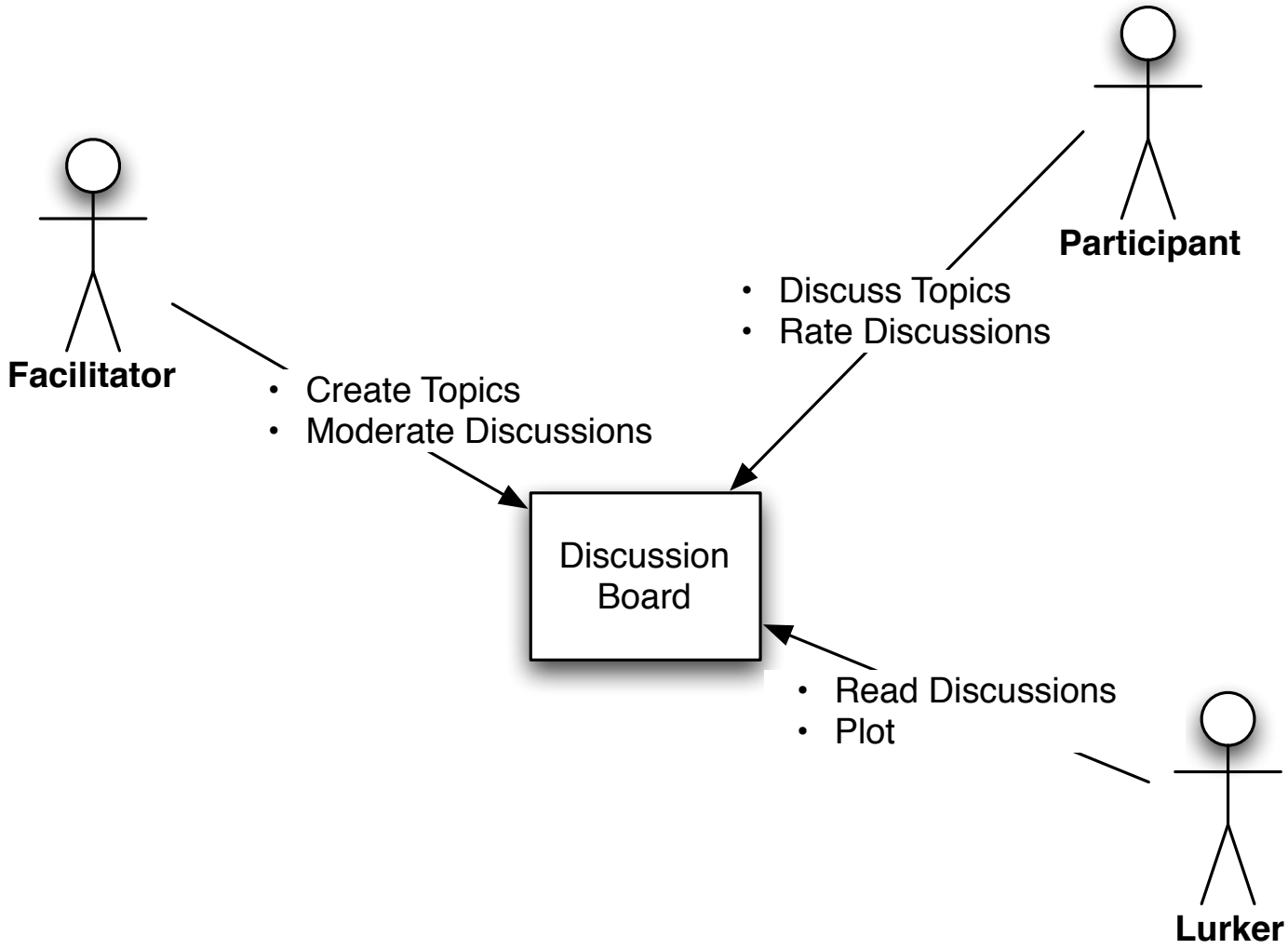
- Doesn't scale well to show high numbers of relationships on a single page view

Recommendation

- Use context notation for high level "capability" scoping, then drop to Use Case diagrams for requirements



# Simple Diagram

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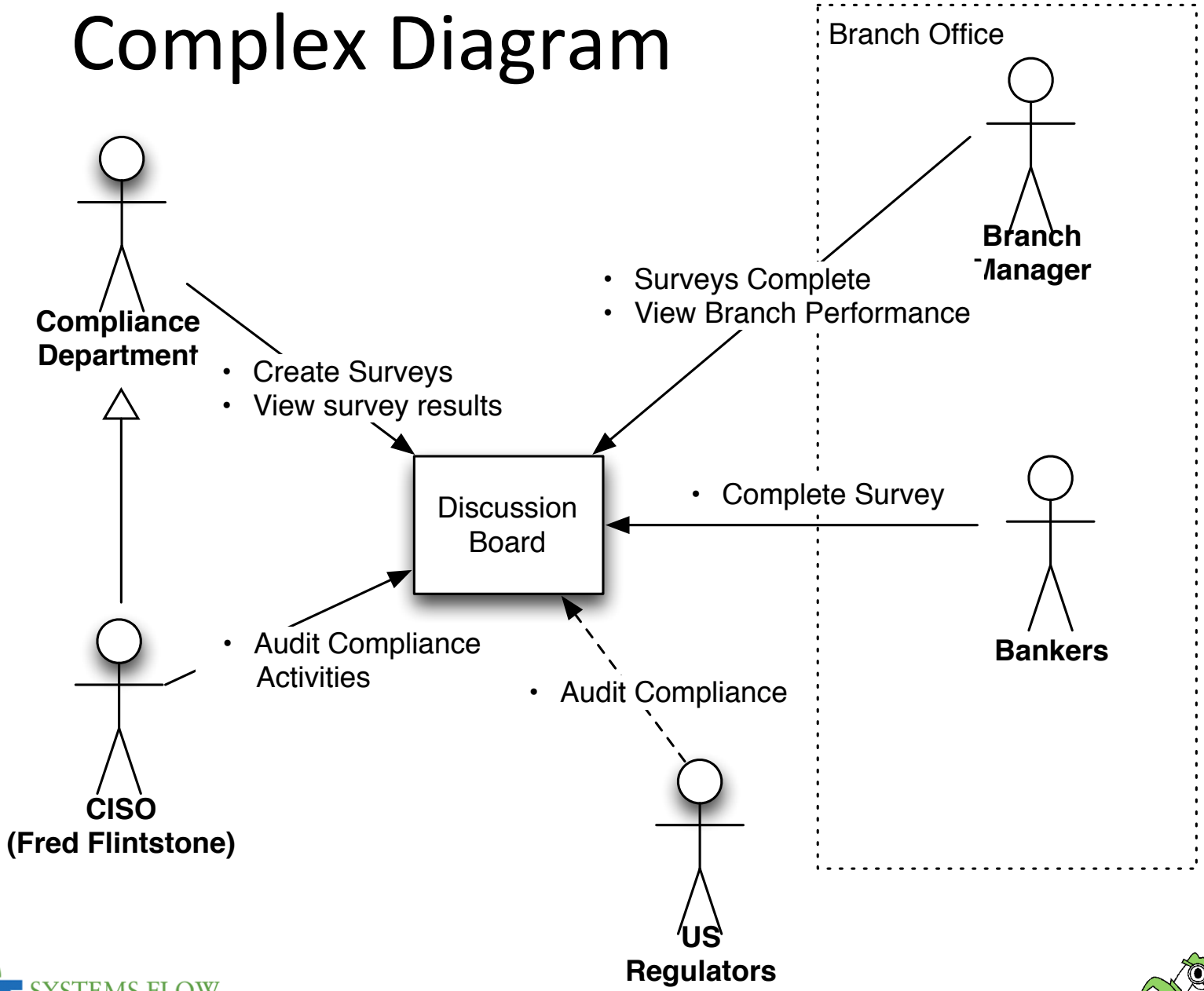
# Complex Diagram



# System Context Diagramming Tips

- Start by black boxing the system and capturing actors
- Remember that a human being can have more than one role
- Name actors for roles when possible (vs. people or departments)
  - If needed for audience queues, put names in parenthesis
- Stick with language familiar to the business users
- Use “Use Case Name” conventions to label relationships
  - Verb + Domain Specific Noun (“Approve Orders”)

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# System Context – Advanced Tricks

- An actor can have a relationship with another actor
  - eg. A customer who interacts with a call center agent
- An external system can be an actor
  - Be careful!  There is likely a better diagram for that.
- An “indirect relationship” can be shown with a dotted line
  - eg. An external auditor may never use the system, but may require capabilities of the system
- An actor can “inherit” the capabilities of another actor, if required for stakeholder clarity
- Logical groupings or locations can be indicated with bounding boxes



# Case Study

| | |
|---|---|
| **The Company** | *Massive Insurer, Inc.* |
| **The Product** | *EzeWorkflow* |
| **The Project** | New to you! |
| **The Task** | Produce a Systems Context of the solution |

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# Case Study

**To:** ben.sommer@sysflow.com
**Subject:** Eze Workflow

Ben,

Help! I need you to learn more about this EzeWorkflow product that Operations is rolling out for the Claims agents – we need to get engaged ASAP. I am not even sure what exactly they will be doing with it.

Regards,
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← Title First!



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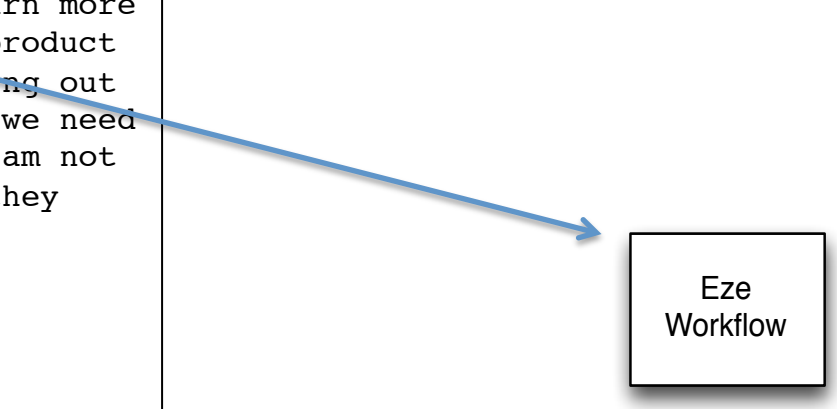




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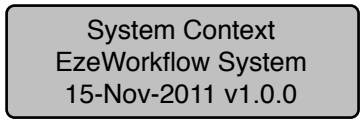


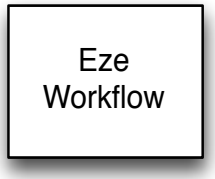

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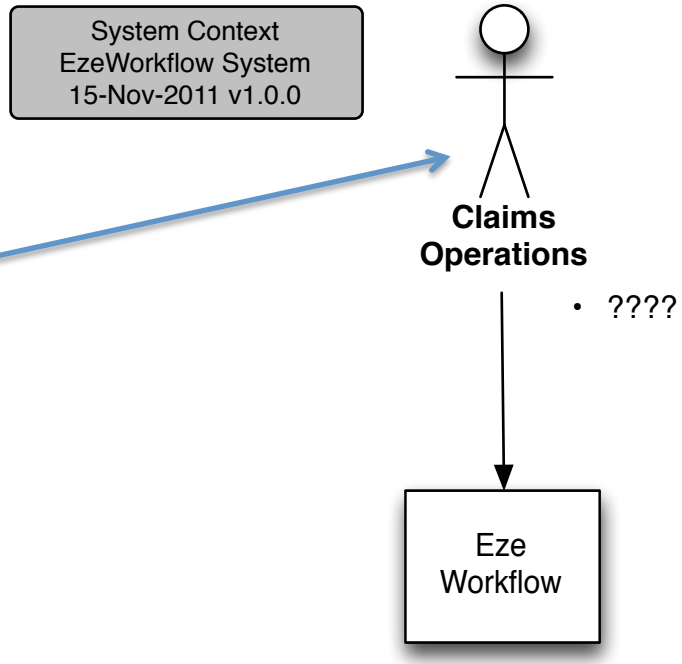

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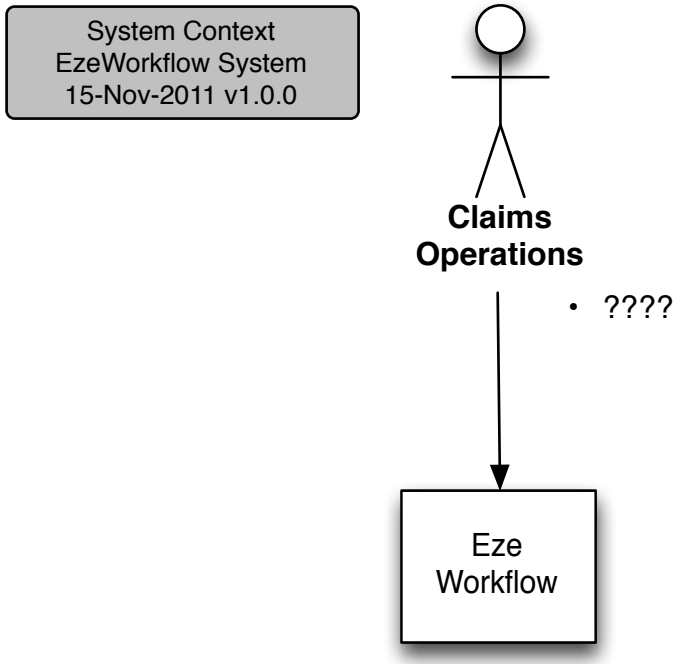

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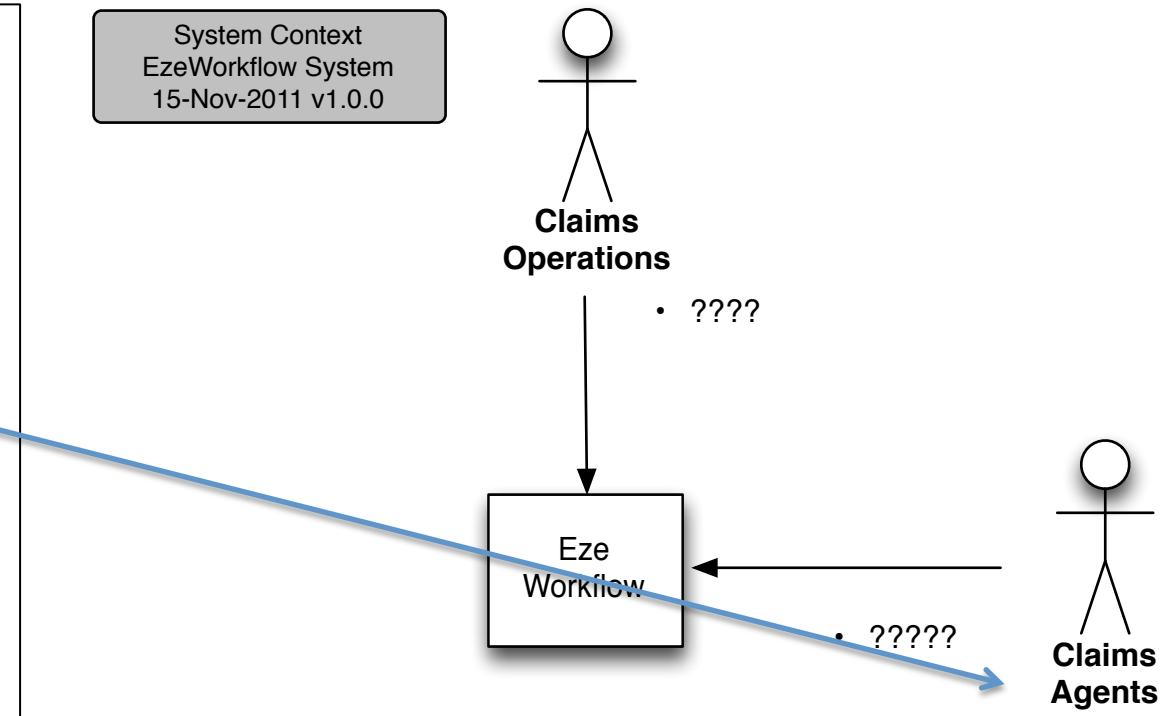

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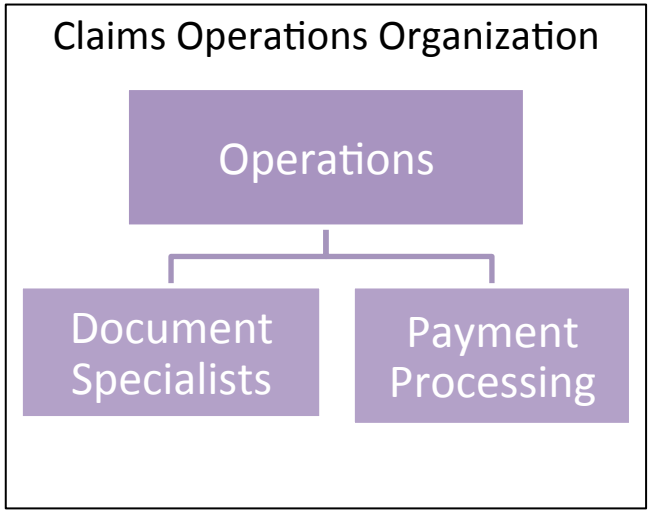


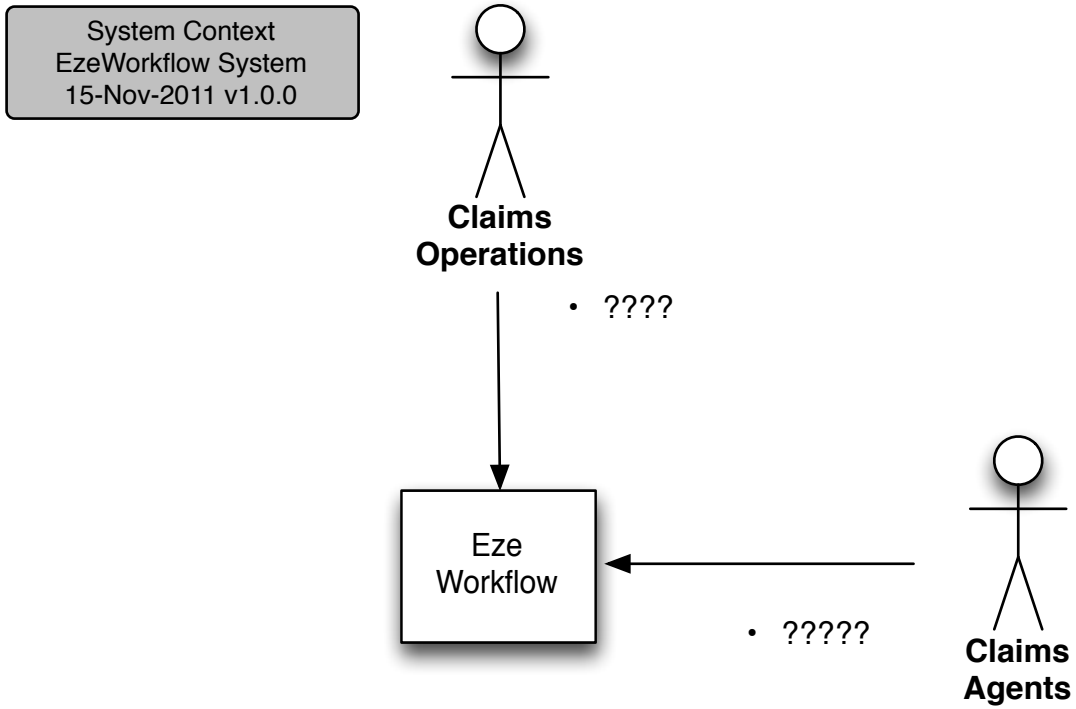

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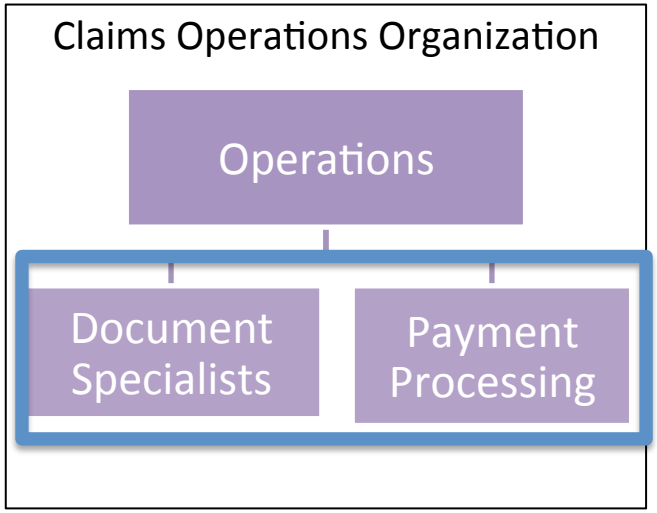


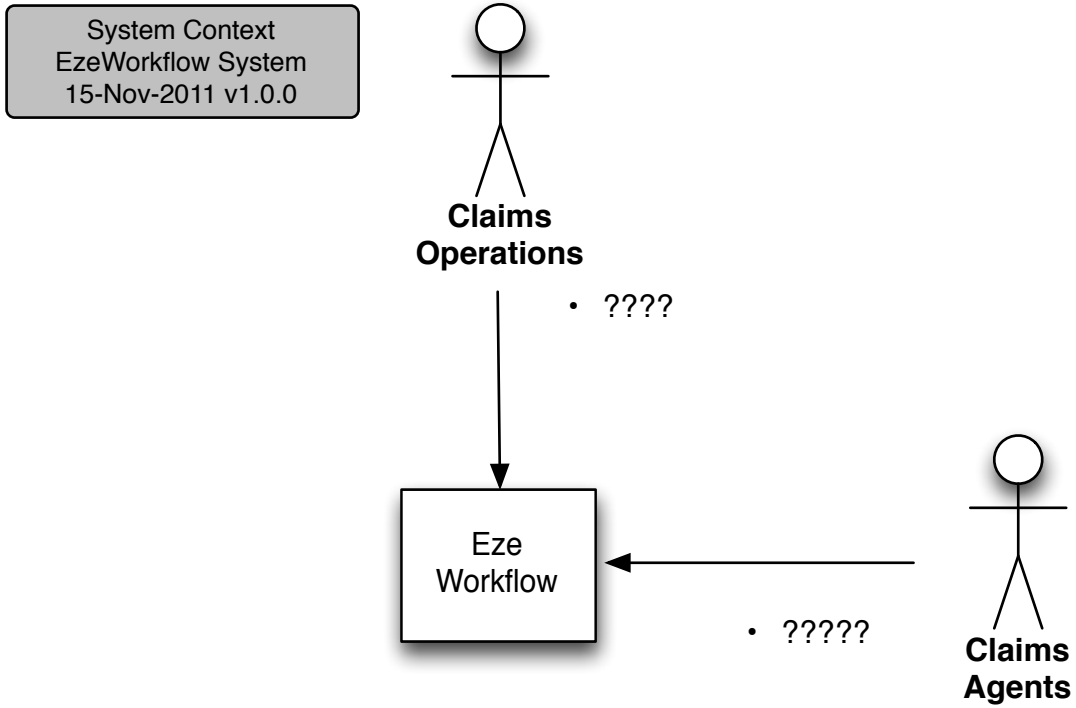

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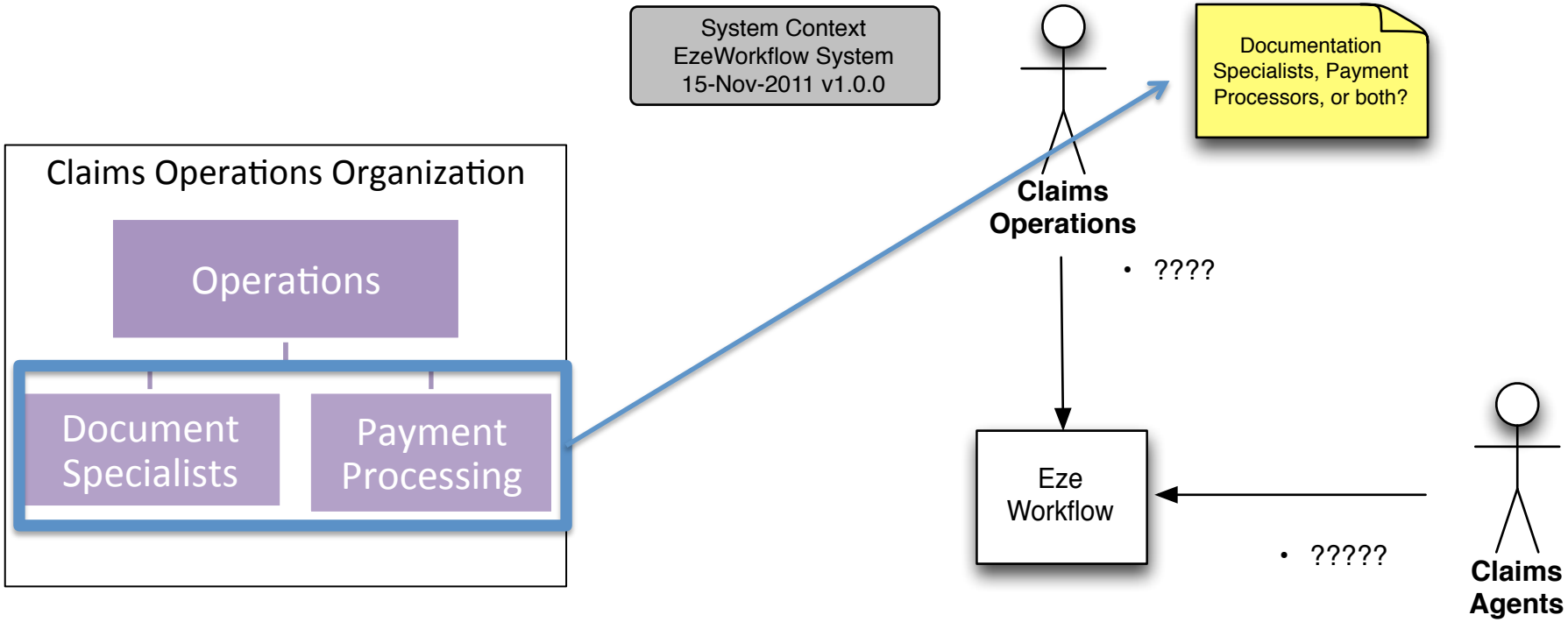

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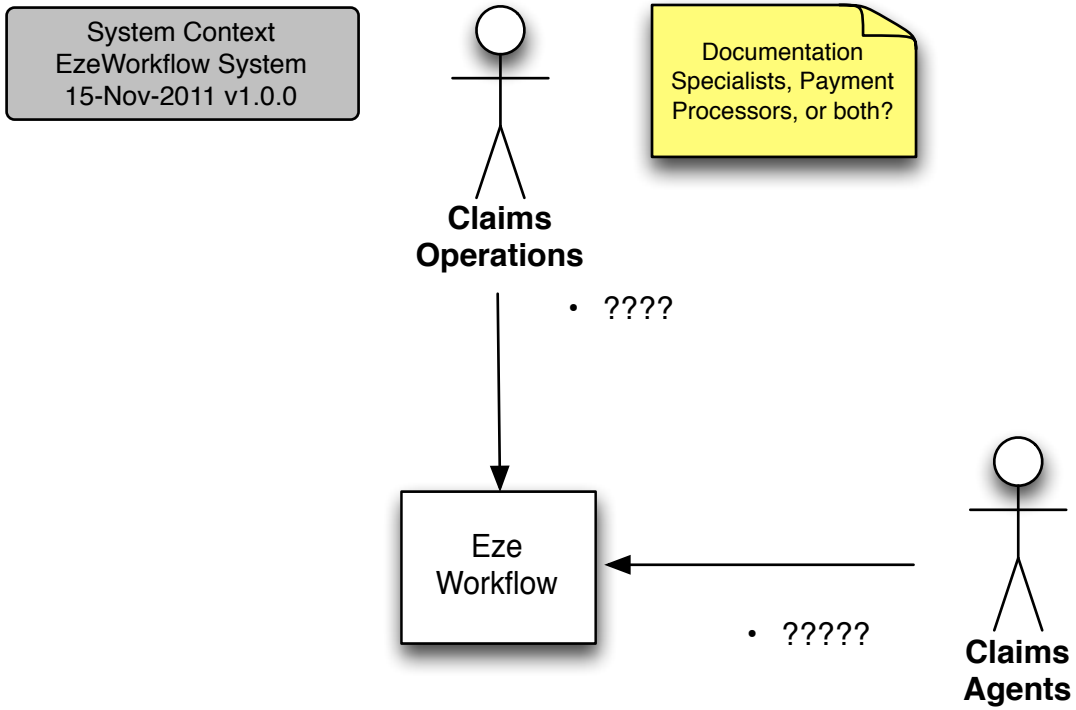
*Excerpted from Executive Overview at beginning of Project Vision Document…*

EzeWorkflow will allow remote claim agents to submit claims electronically, improving processing time and reducing associated costs (auto rental) by 25%. A similar improvement in processing time, along with a marketable improvement to customer service, will be achieved by EzeWorkflow's ability to recognize and process claims faxed directly from customers.

Efficiencies gained by this automation will allow Claims Operations to support a 40% growth in claims volume without increasing the size of the Documentation Specialists team.



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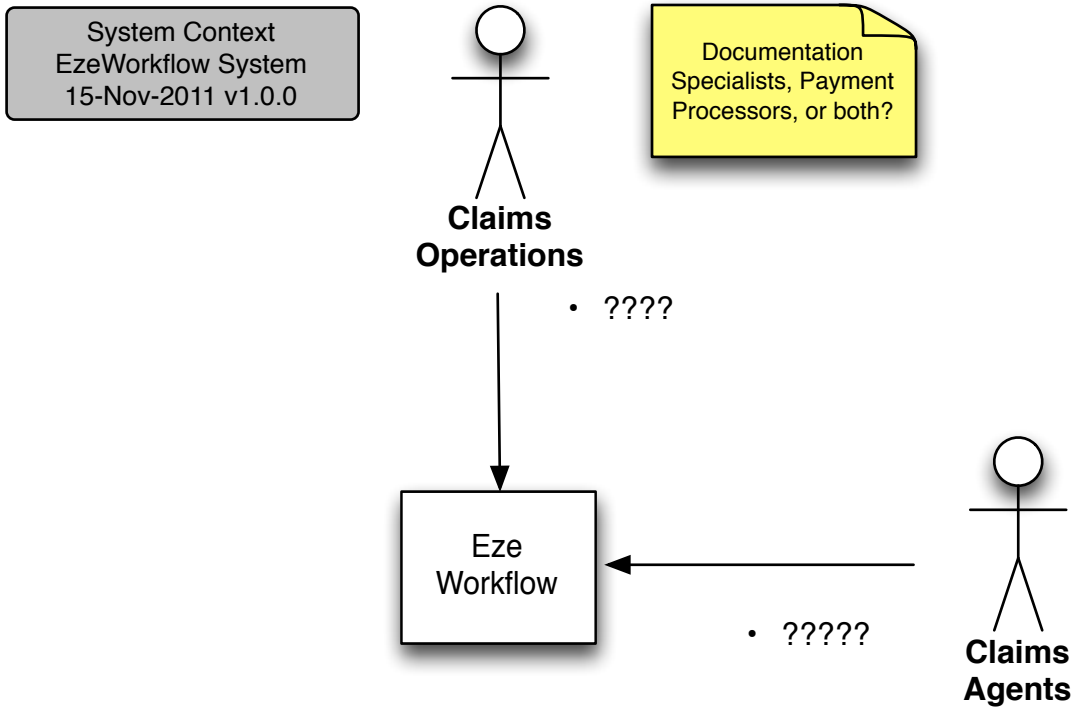

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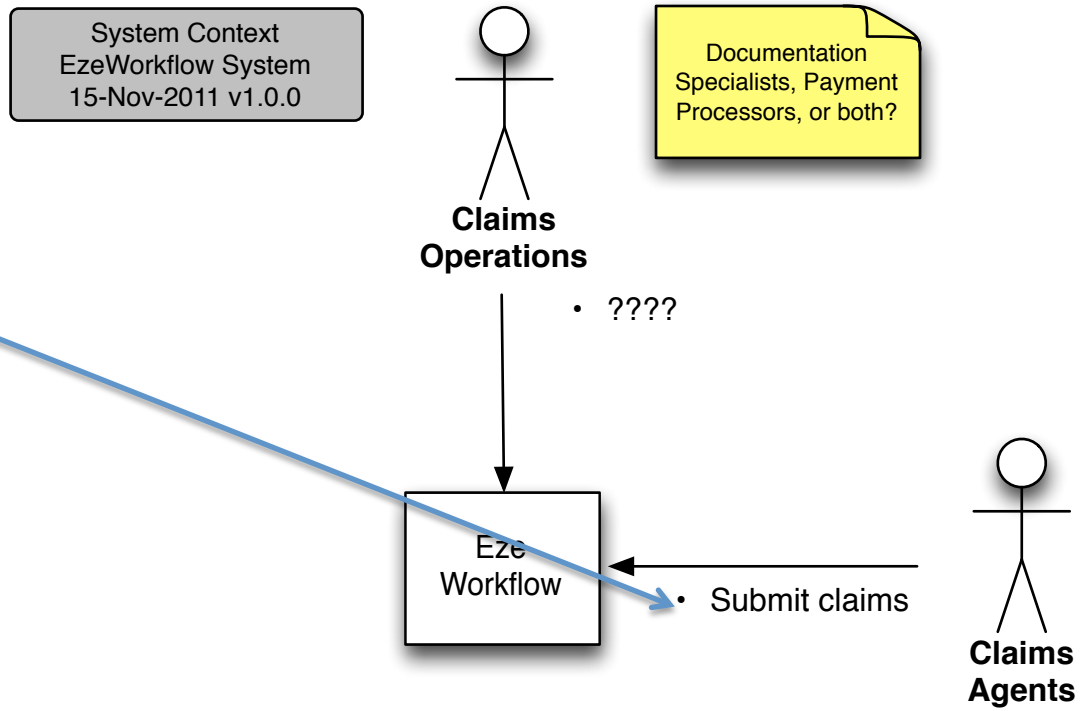

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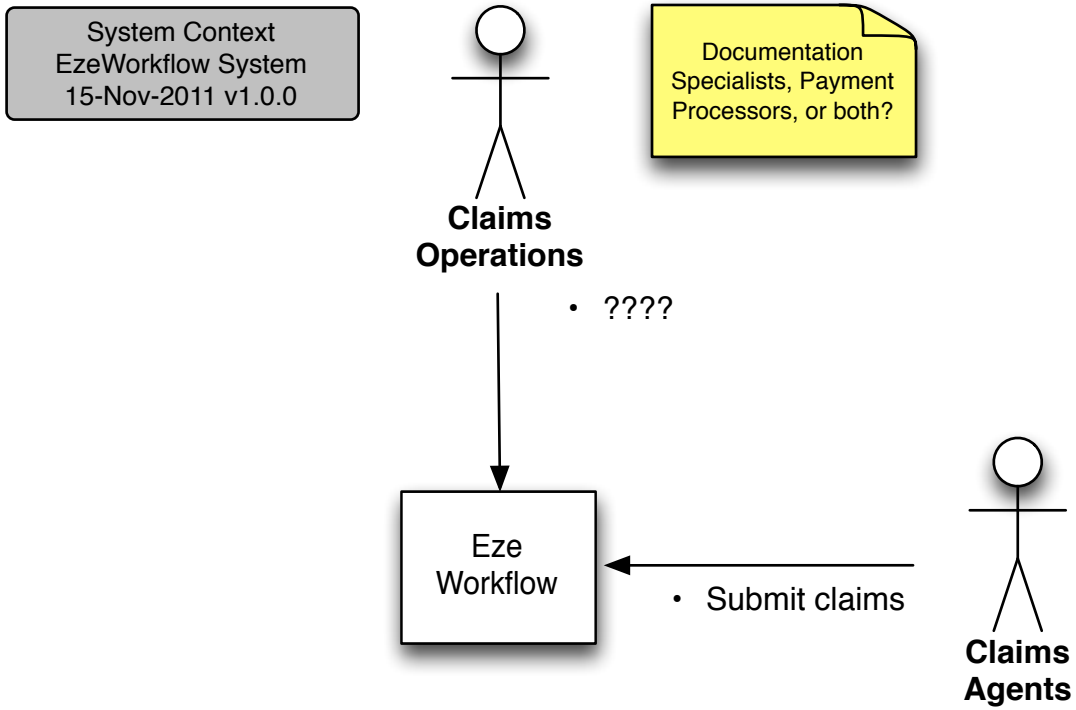

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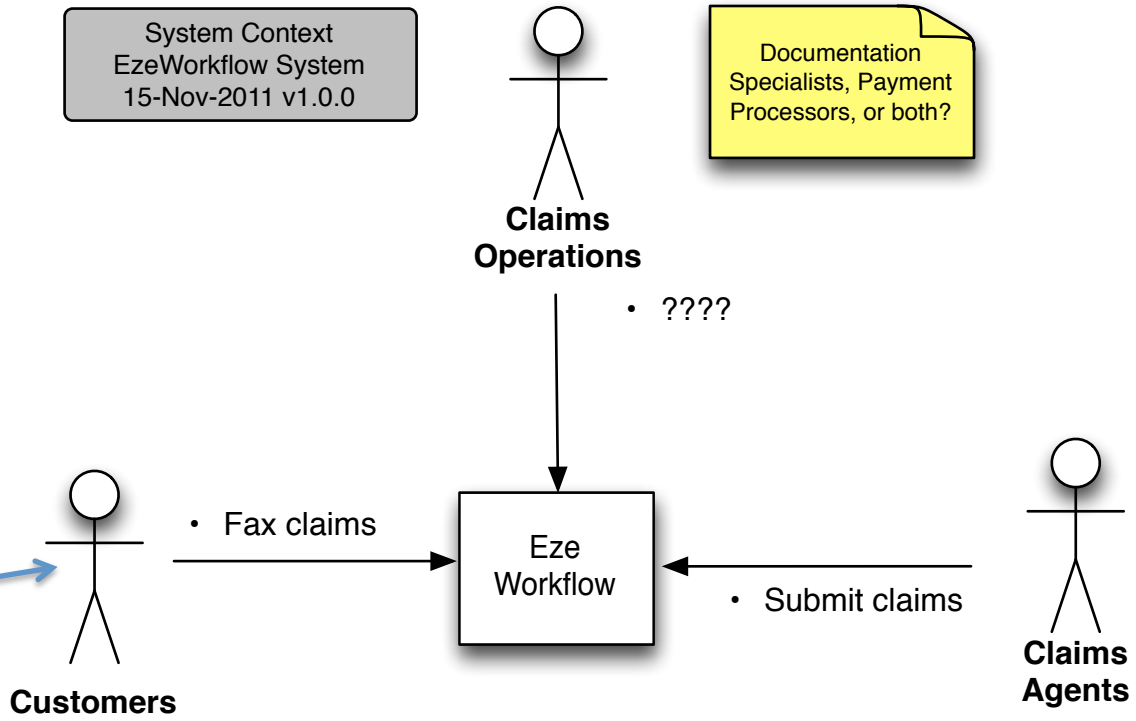

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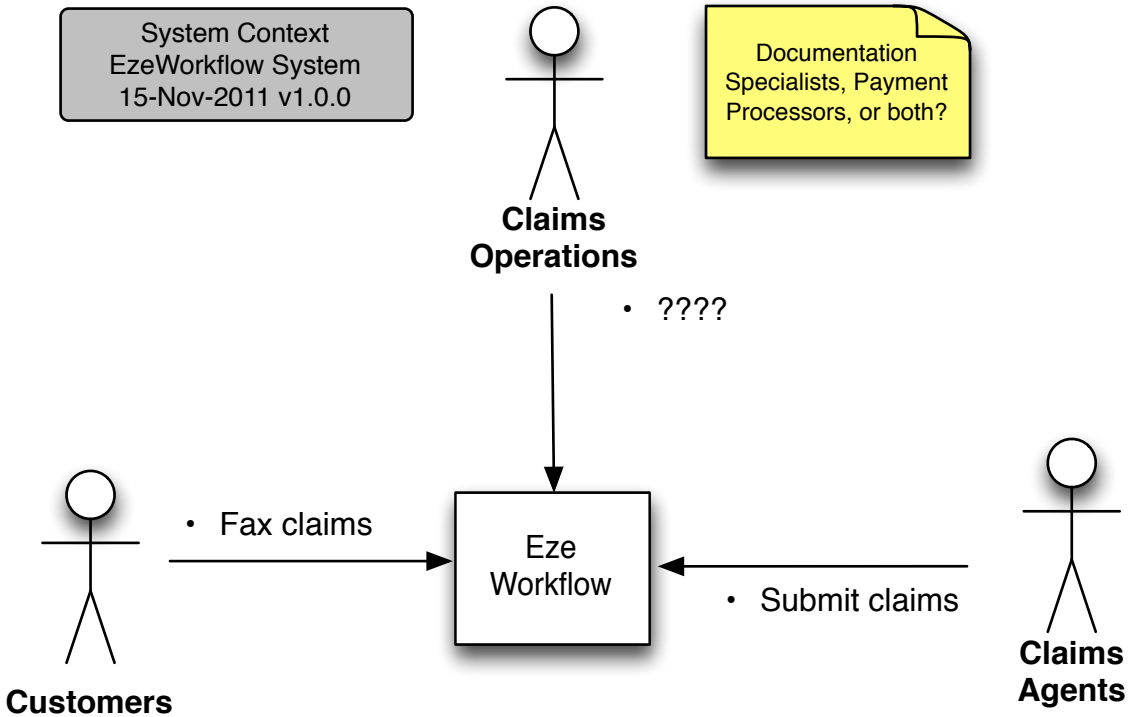

# Case Study

*Excerpted from Executive Overview at beginning of Project Vision Document…*

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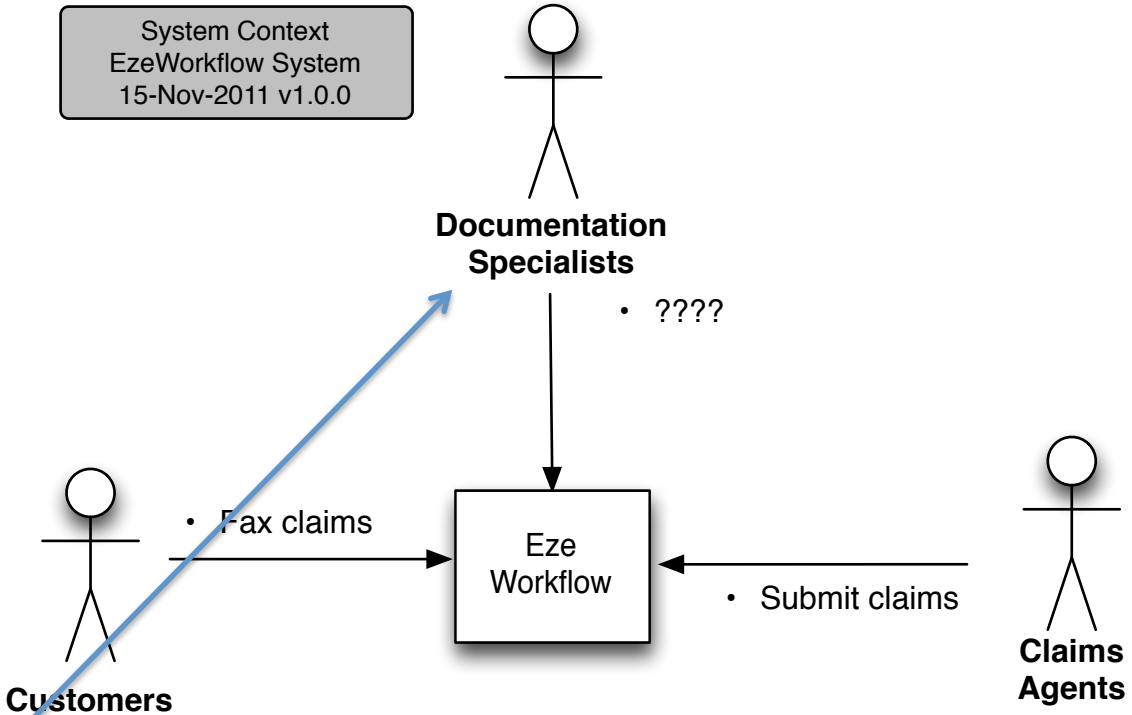

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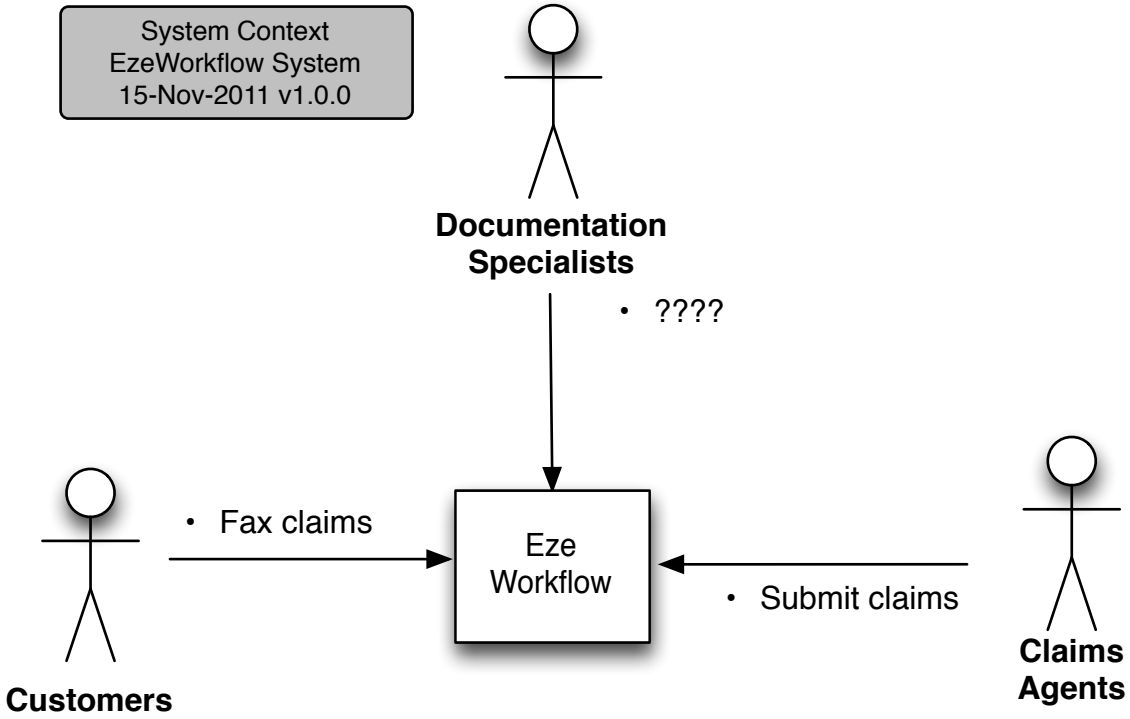






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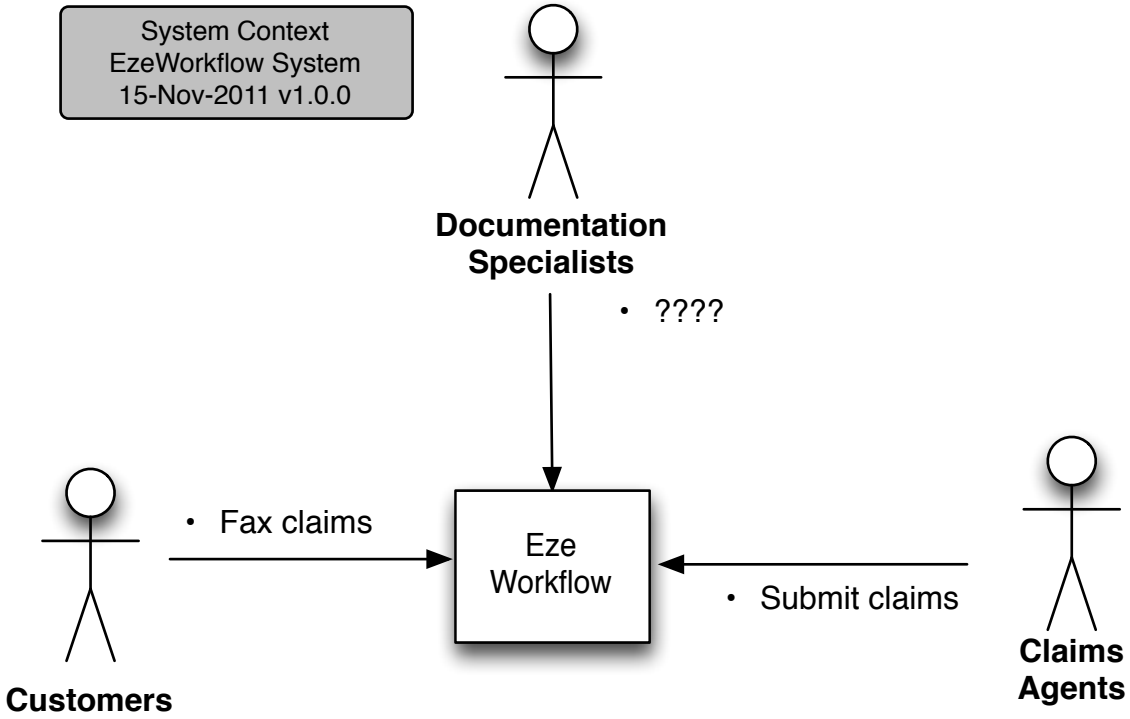






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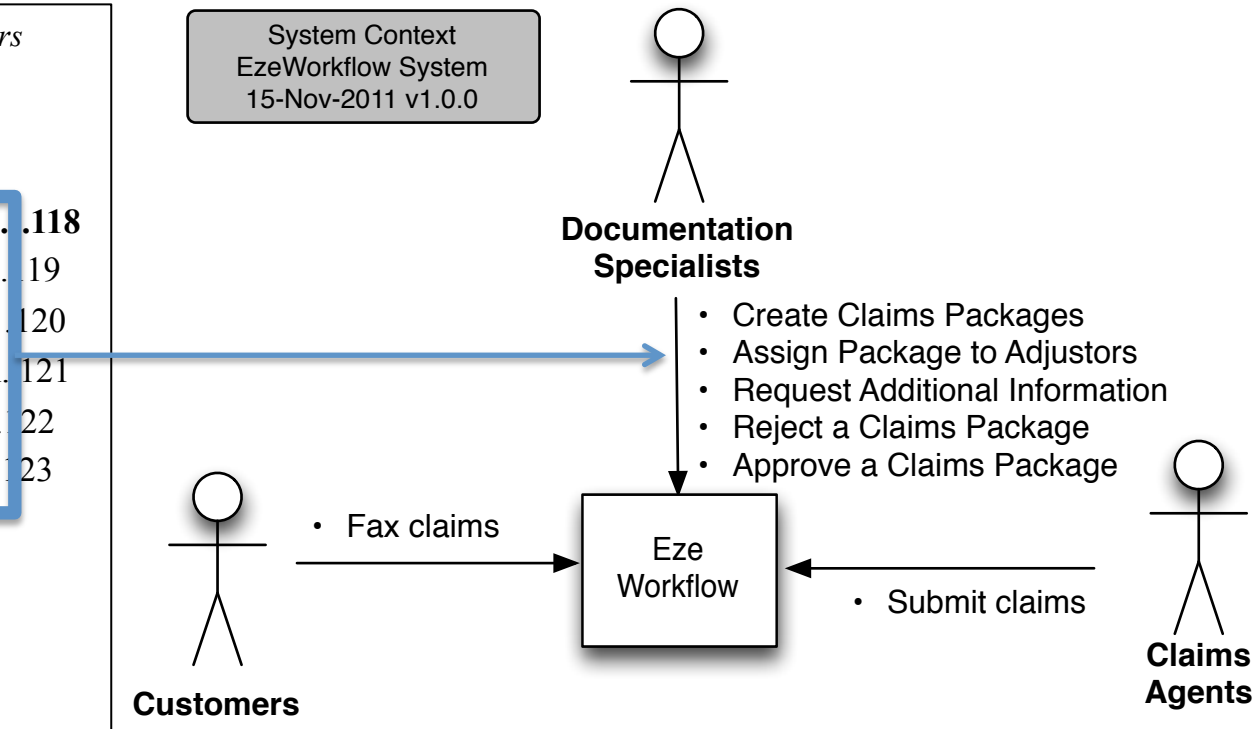

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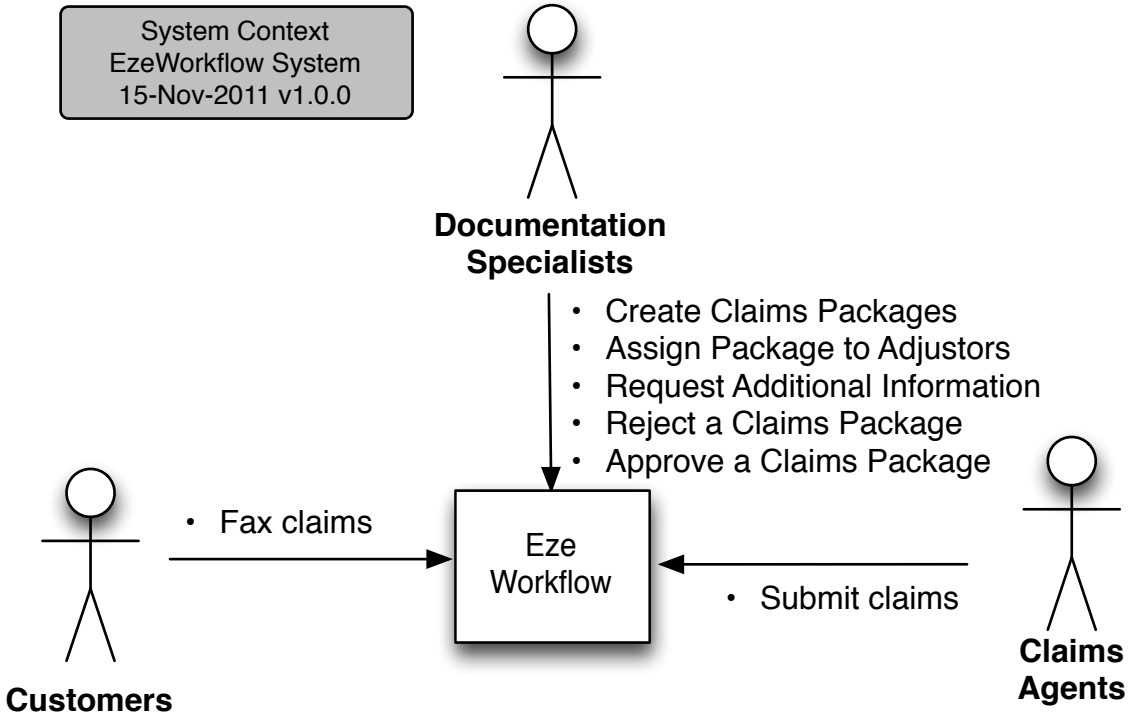






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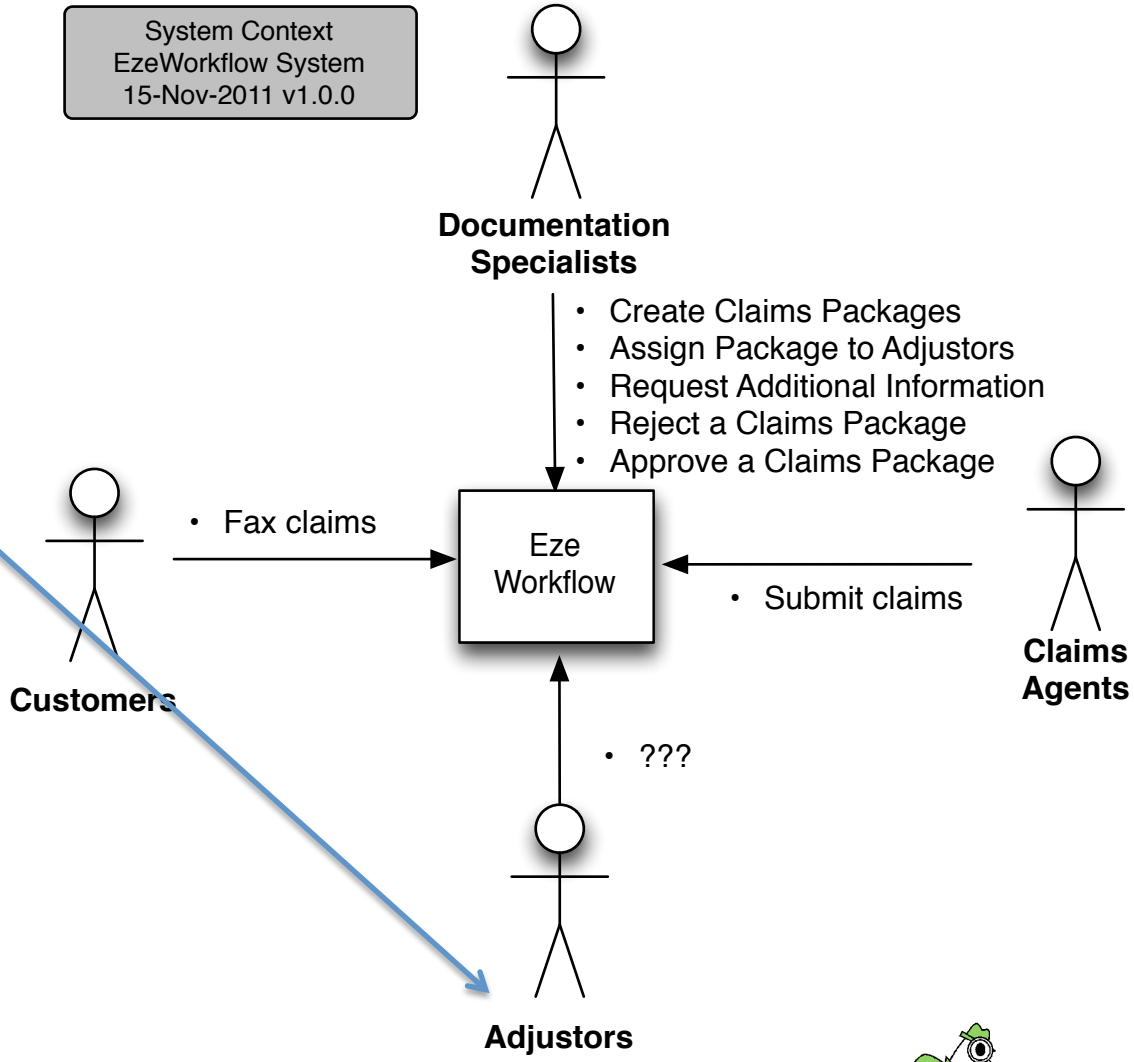

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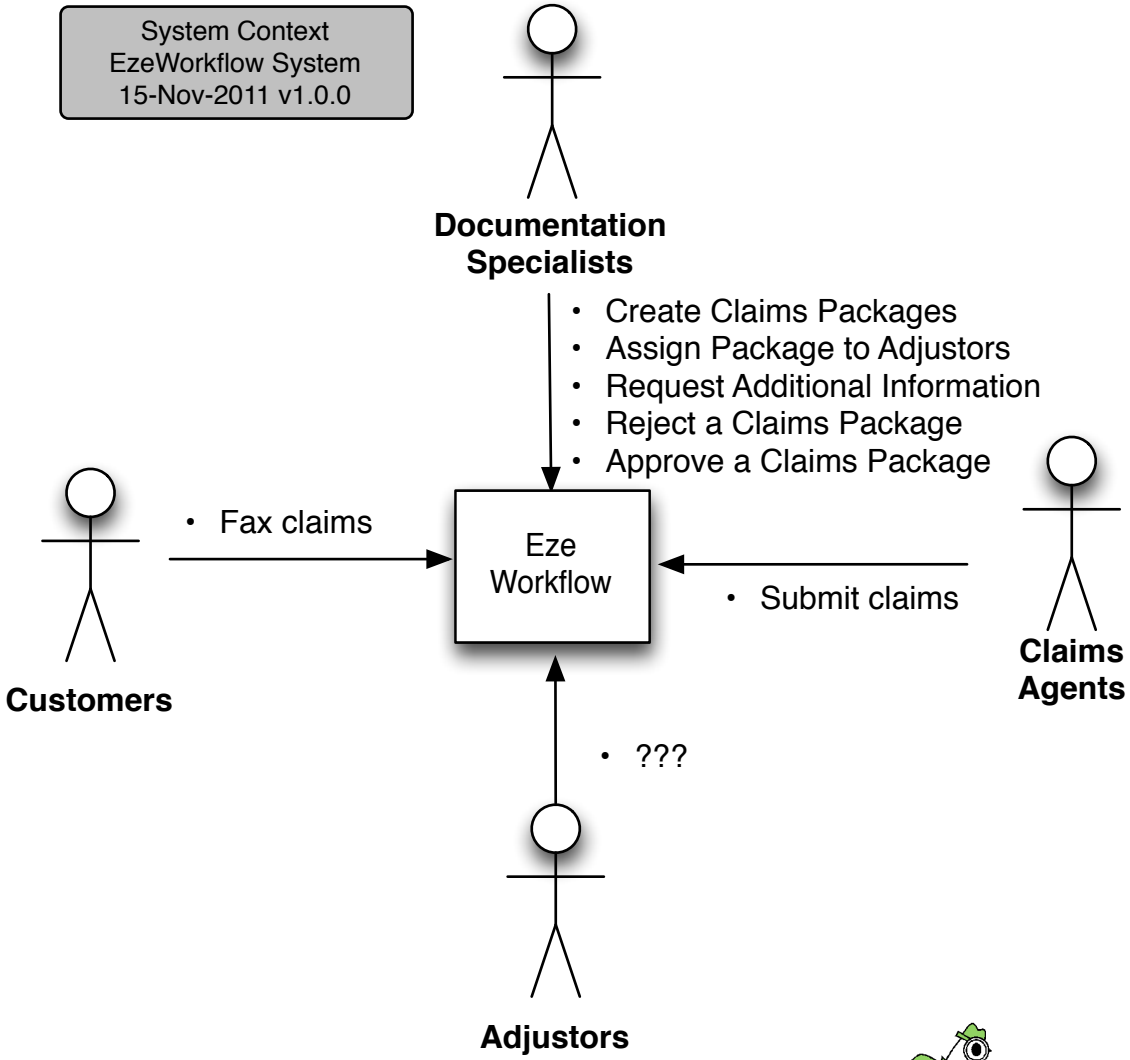






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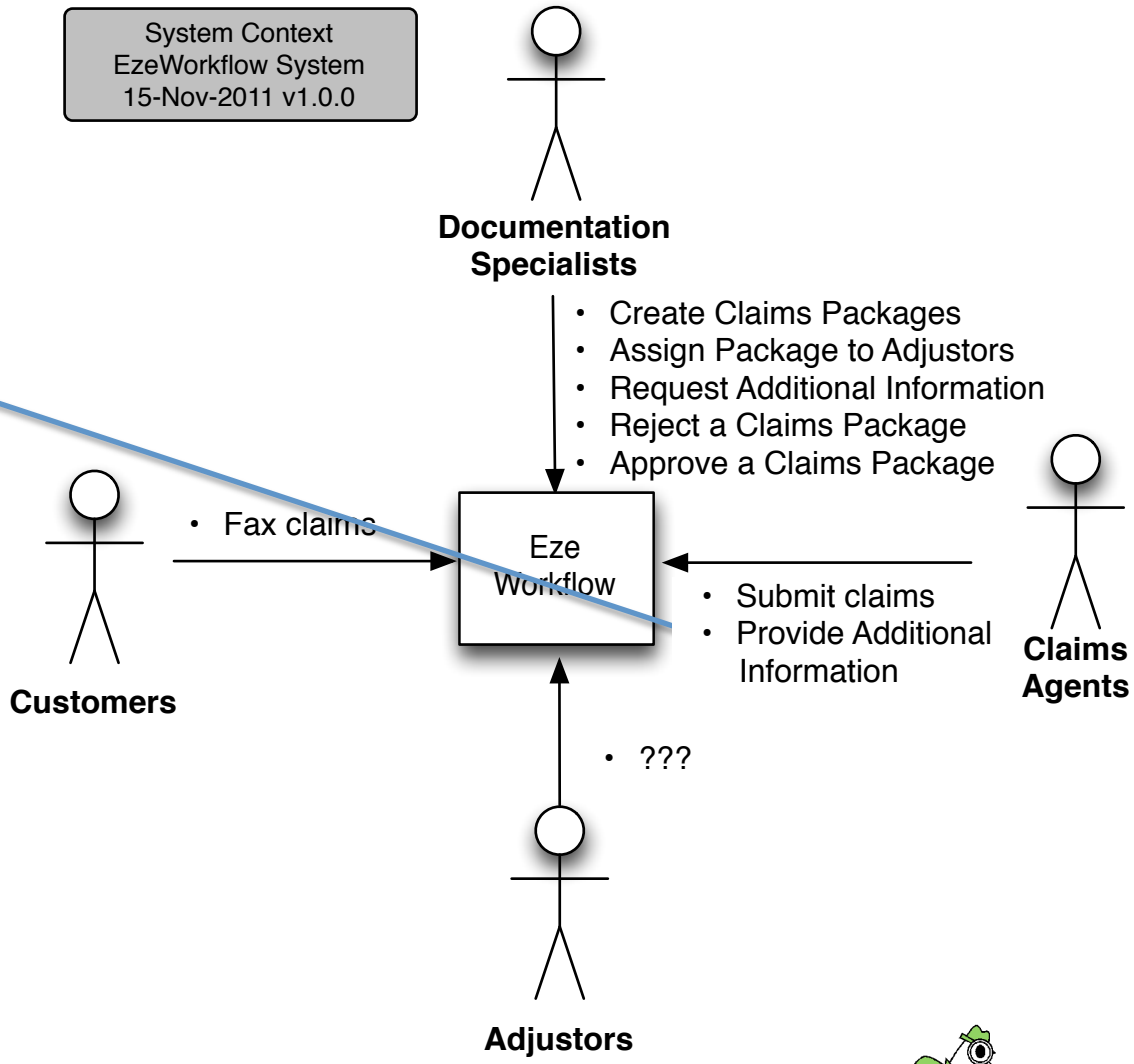

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*Business Requirements Document.*

**Assumptions**

A01: Rightfax will be used for the fax gateway.

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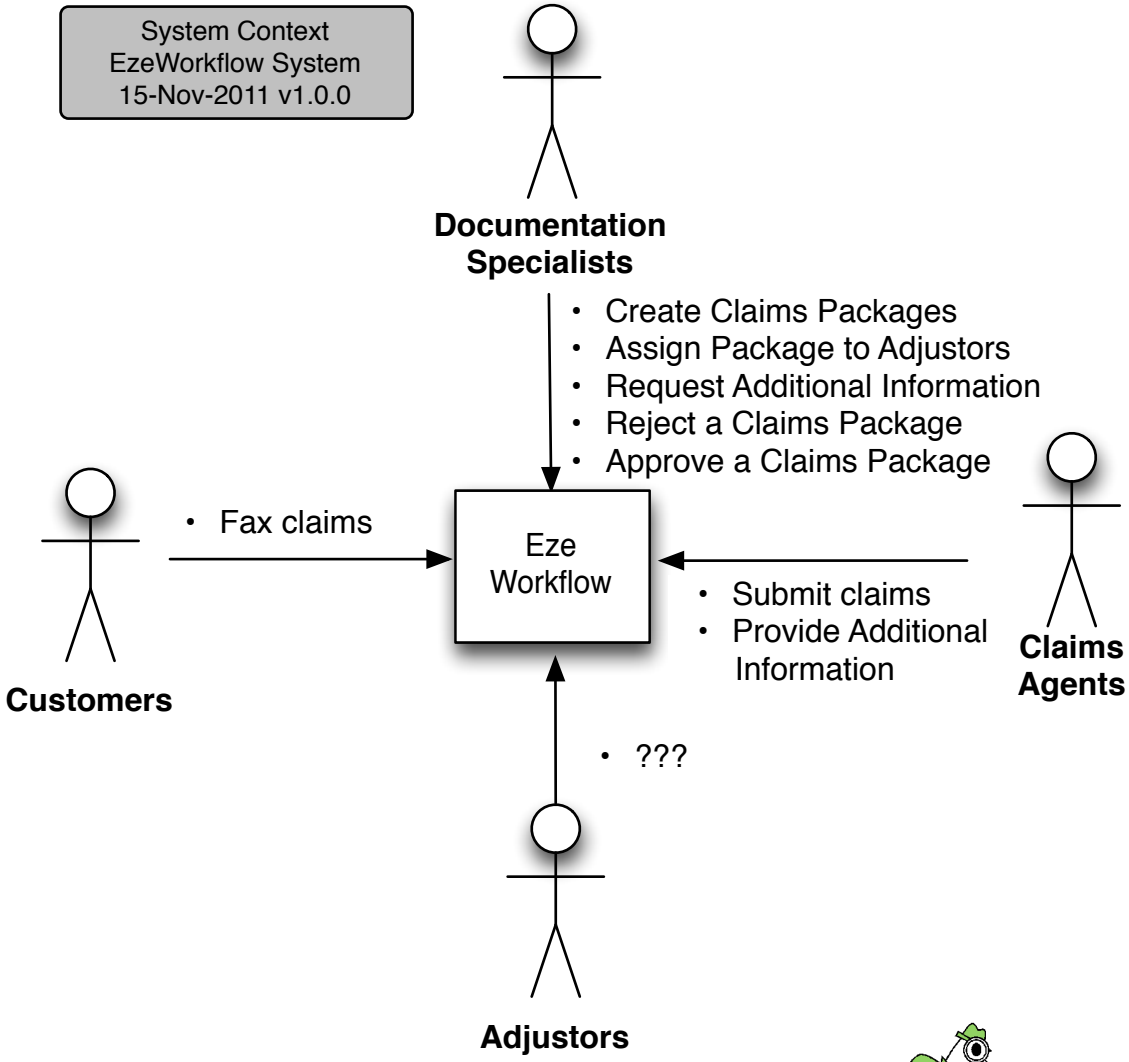
A03: All development will be done using Java.



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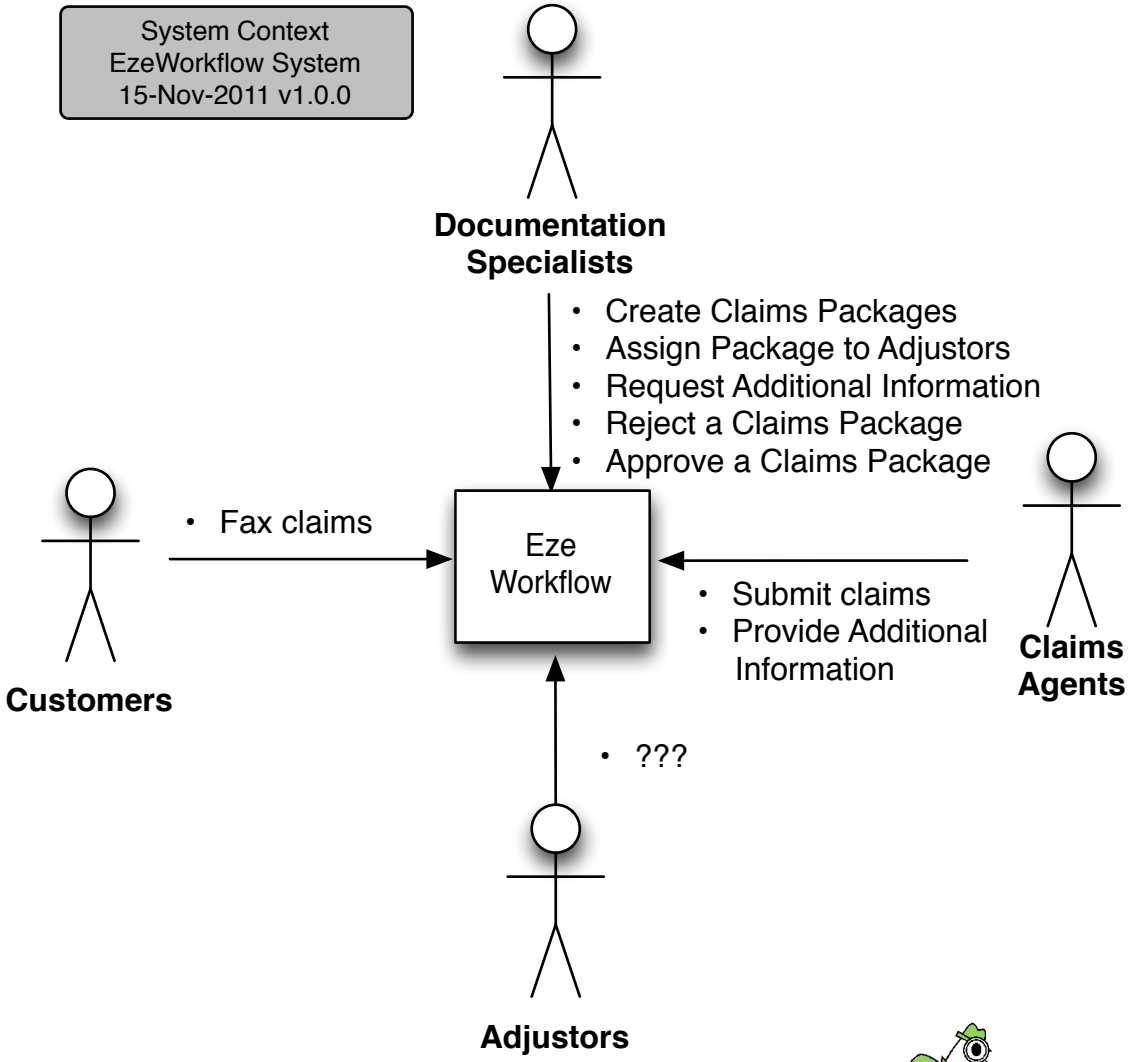

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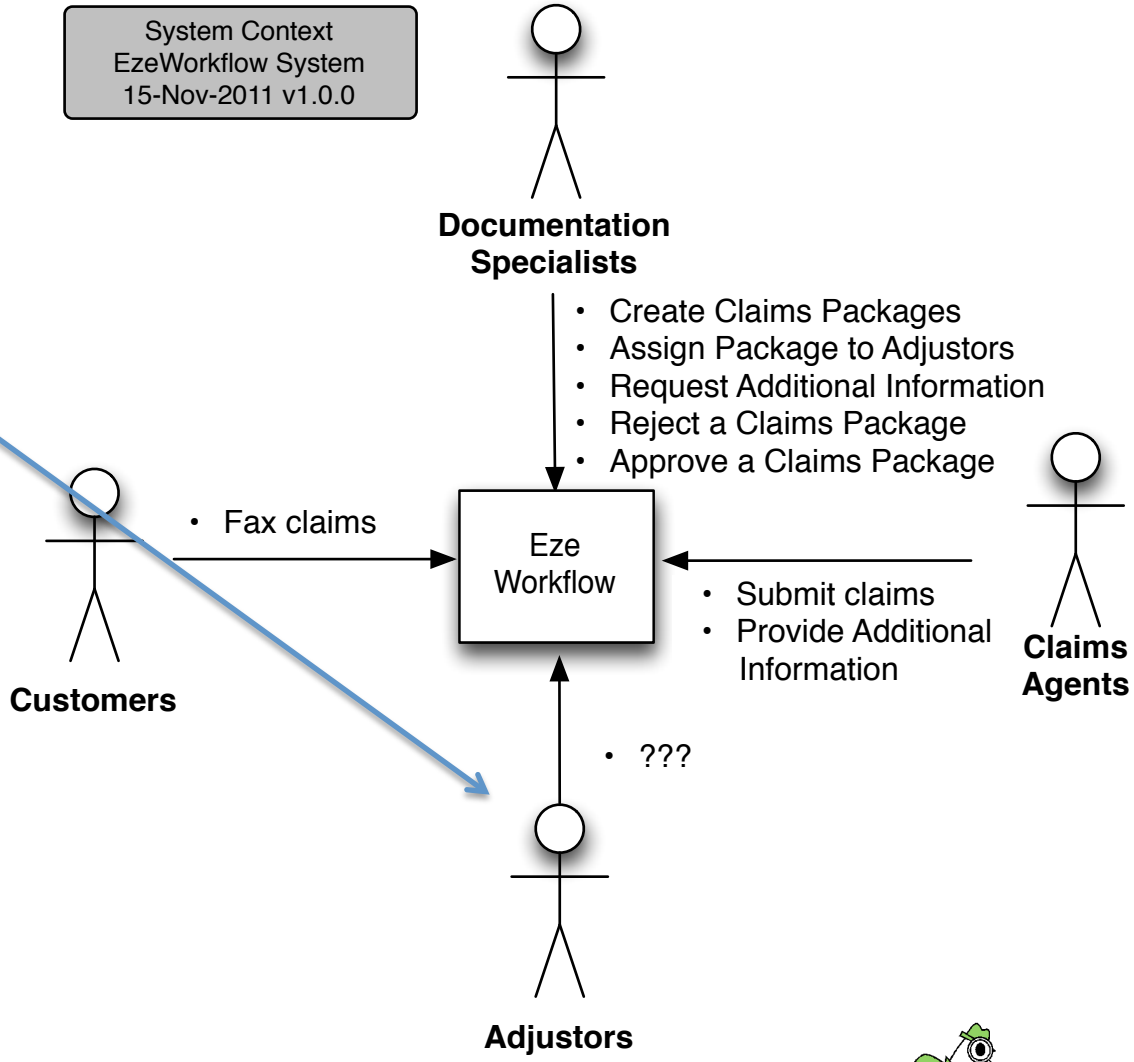

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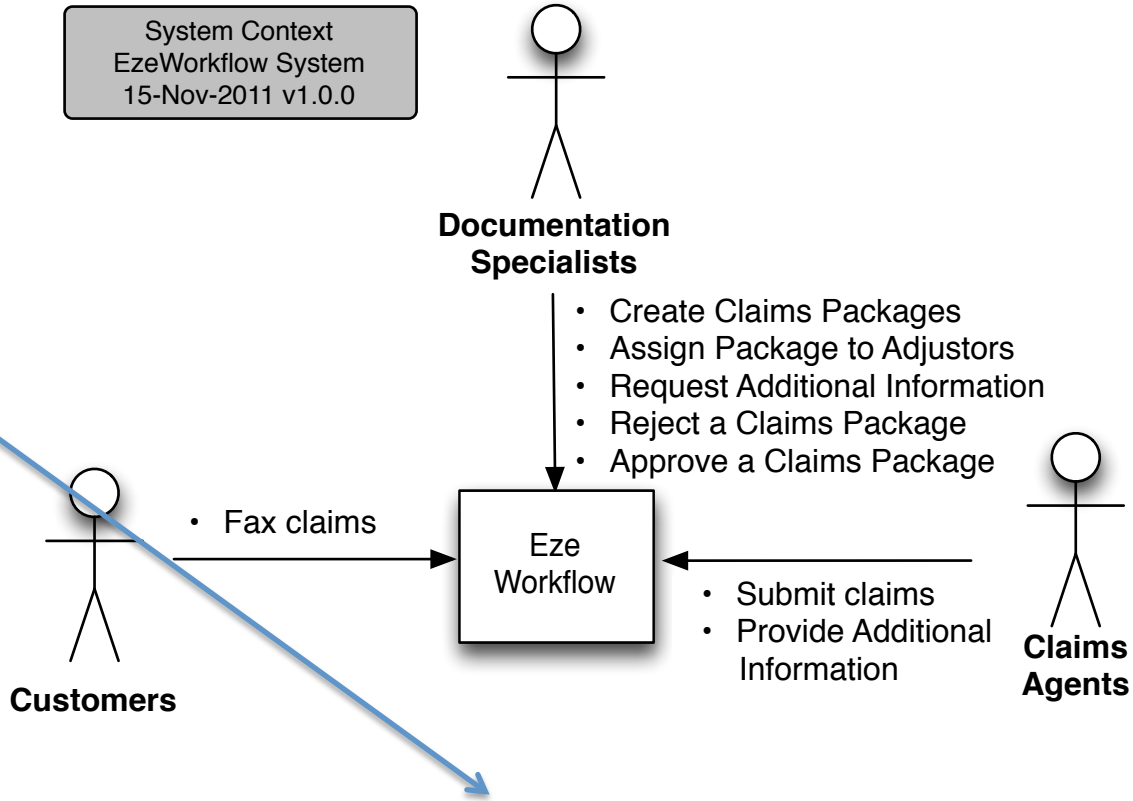
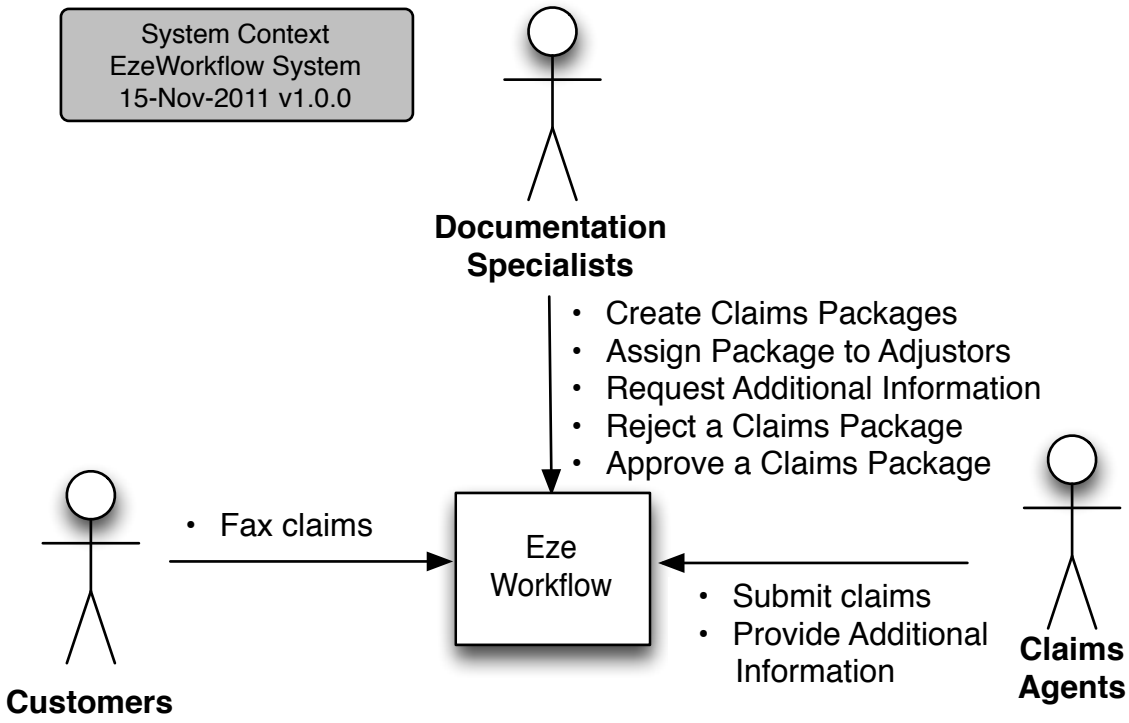




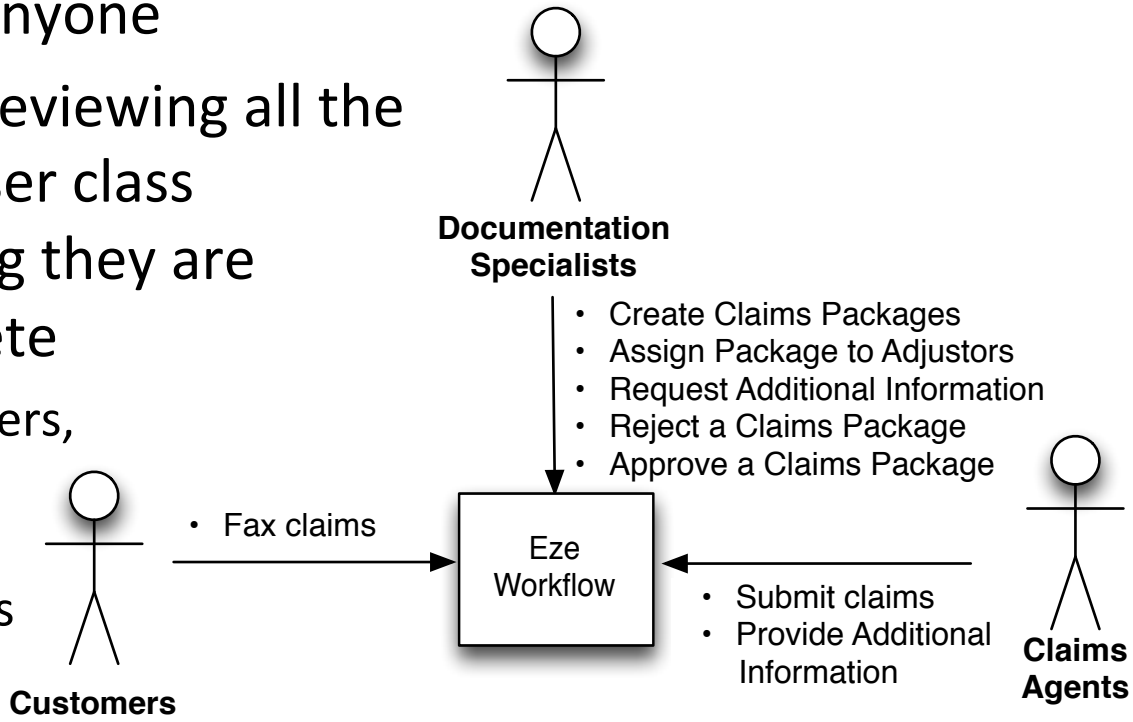



# Case Study



# Tips for System Context Reviews

- Explain the scope and notation for the diagram
- Walk the diagram introducing all user classes, asking at the end if you missed anyone
- Walk the diagram reviewing all the capabilities each user class requires, confirming they are correct and complete
  - Start with direct users, then indirect, then users who act through other users



# Remember…

- Always start with a diagram. It's all about the diagram!
- Iterate rapidly and frequently. It accelerates convergence.
- Take any information you can get. You never know where your next clue will be found.



# References

More information on this topic from Systems Flow -

- http://www.sysflow.com/publications/
- http://www.sysflow.com/blog/investigative-architecture/

Wikipedia article on Systems Context notation -

- http://en.wikipedia.org/wiki/System_context_diagram

More about me, plus additional articles -

- http://www.sysflow.com/author/daniel.hughes/

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# Any Questions?

**Systems Flow** helps organizations dramatically improve their competitive advantage through the practical, effective application of best practices in enterprise architecture and software development.

**Investigative Architecture** is the term we coined back in 2008 for our approach that facilitates the rapid assessment and documentation of 'as-is' and proposed IT architectures. We developed this Investigative Architecture approach a decade ago in support of our enterprise and solution architecture consulting services.

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Any questions? Email me at dh@sysflow.com

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