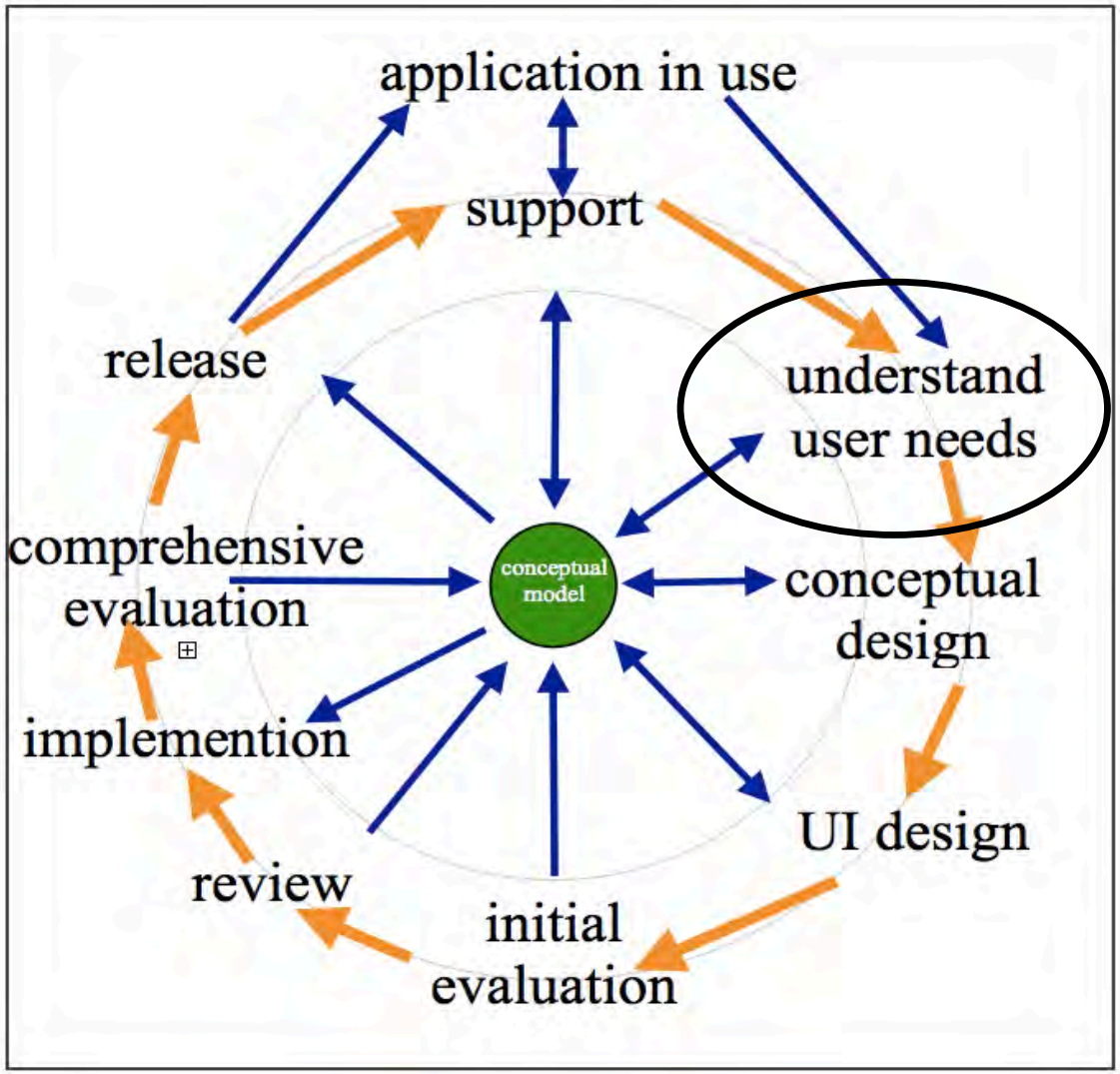
Understanding Users & Tasks

CS 490

Prof. Jeff Johnson

Position in Development Cycle



Focus on Users & Tasks

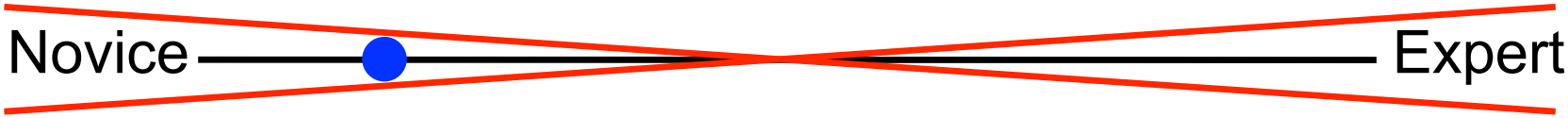
- Not on technology
- Crucial questions:
  - Who is it for?
  - What is it for?
  - What problems do users have now?
  - What are users' skills?
  - How do users think about their work?

Understanding Users

- *Decide* who they are
- *Investigate* their relevant characteristics
  - Directly: interviews, focus groups, observation
  - Semi-directly: questionnaires, surveys
  - Indirectly: read, view videos, talk to managers
- *Enlist* some as subject matter experts
  - Not just objects of study
  - Members of design team

Users: Not Just Novice *vs.* Experienced

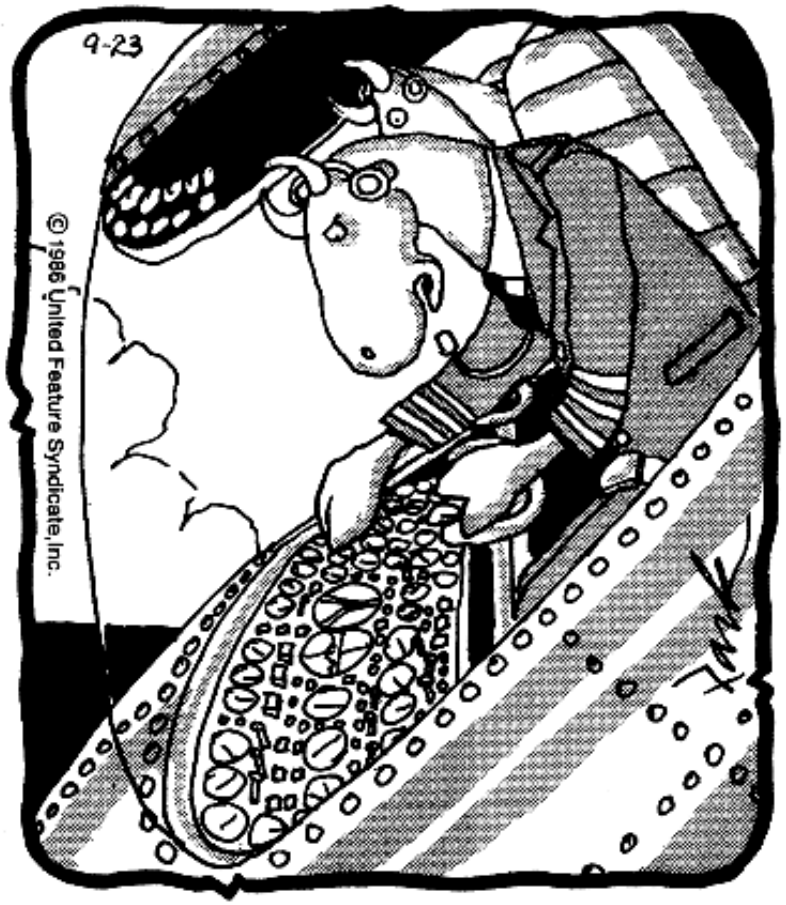
- Common view: users on one dimension



- 3 knowledge dimensions:
  - General computer savvy
  - Knowledge of specific app / tool
  - Knowledge of task domain
- Users can be high or low on any of these

Consider Users' Abilities

- Vision
- Hearing
- Motor skills



"Darn these hooves! I hit the wrong switch again! Who designs these instrument panels, raccoons?"

Cartoon used with permission from Park-Art

Results of User Analysis

- User Profiles
- Personas

User Profiles

- Don’t just talk about “the user” or “users”
- List *different types* of users you foresee
  - The important ones
- List relevant characteristics of each
  - Task-domain knowledge: low, medium, high
  - Responsibilities or common tasks
  - Computer skill-level

User Profiles: Example 1

- Software: App to control protein analysis instrument
- Profiles: four types of users
  - Lab technician
  - Graduate student
  - Scientist
  - Power User Scientist

User Profile: Lab Technician

- Responsibilities: Calibrate, operate, maintain instrument. Run (complex) experiments for scientists
- Knowledge of instrument: high
- Knowledge of biological analysis: low
- Knowledge of competitor instruments: no
- Computer skills: high

User Profile: Grad Student

- Responsibilities: Calibrate, operate, maintain instrument. Run simple experiments for scientists
- Knowledge of instrument: low-medium
- Knowledge of biological analysis: low-medium
- Knowledge of competitor instruments: low
- Computer skills: medium-high

User Profile: Scientist

- Responsibilities: May be principal investigator. Operate, maintain device. Run experiments.
- Knowledge of instrument: low-medium
- Knowledge of biological analysis: high
- Knowledge of competitor instruments: varies
- Computer skills: medium

User Profile: Power-User Scientist

- Responsibilities: Calibrate, operate, maintain device. Run (complex) experiments for other scientists.
- Knowledge of instrument: high
- Knowledge of biological analysis: high
- Knowledge of competitor instruments: high
- Computer skills: medium

User Profiles: Example 2

- Software: DB admin support app
- Profiles: eight types of users

	DB Admin (n=3)	App Admin (n=2)	App Admin Mgr (n=3)	Security Admin (n=2)	Product Cert. Eng. (n=1)	Server/OS Admin (n=1)	Server/OS Admin Mgr (n=1)	System Architect (n=1)
Years Experience	Job: 2 Field: 4-13	Job: 3.5 – 5 Field: 5-13	Job: 2-10 Field: 8-15	Job: 1-2 Field: 10+	Job: 12 Field: 20	Job: 12 Field: 12	Job: 5 Field: 15	Job: 6 Field: 15+
Duties	Production DB monitoring, L2 support	Upper tier support for Oracle apps	Monitor apps, L2-3 support, setup, config., manage app admins	Setup, audit, troubleshoot security systems	Test, certify, & document new ERP products for DBAs	L3 support for unix servers & OS, patches, upgrades	Mng support team, CUA for 40-50 users, 100 CSIs, ASR for 2K servers	Design systems, oversee setup & operations
Products Supported (HW/SW)	EM, DB,EBS, App Server *(SW)*	Oracle apps, Solaris (one) *(SW)*	EBS, PLM, Supply Chain *(SW)*	Security Suite, security for apps *(SW)*	DB, ERP *(SW)*	Oracle/Sun Servers & OSs *(HW)*	Oracle/Sun servers & OSs *(HW)*	Solaris, DB, SMS *(HW+SW)*
Knowledge of MOS	High	Med-high	Med-high	Medium	High	Low-medium	Med	Low-medium
Uses MOS	Daily (time varies from brief to most of day)	Daily, heavily	Daily	Varies, but daily when has SRs	Daily, 10-20% of day	Lightly (mostly uses IBM Kodiak for SRs)	30-60 mins/day	Rarely: few SRs & doesn't use KB
Files SRs	Yes (frequency varies)	Yes	2 yes (rarely) 1 no	Yes (frequency varies)	Rarely: ~5/year	No	Often	Rarely (mostly during projects)
Follows SOPs	2 yes, 1 no	Yes	No	Yes (some only sort-of)	Yes (also creates SOPs)	No	None involve MOS	Sort-of

Personas

- User profiles fleshed out with:
  - names
  - relevant history & lifestyle details
  - photos or sketches
- Bring personas to project meetings
- Purpose: make users seem real
  - Help designers keep user needs in mind
  - Ground discussion & decisions, e.g.:
    - How would this design work for Fred?

Personas: Example

- Two Personas of Online Shoppers
- Developed by Asterisk Web Design
  - http://www.7nights.com/asterisk/archive/2003/02/example-personas

Persona: Sara Locke

Computer Savvy
***

Web Savvy
***

Online Shopping Savvy
**

Background

Sara is a 25 year old, single woman living in the University District of Seattle Washington. She of average height and build, fairly athletic and has brown hair and green eyes. She is unmarried but has a boyfriend of 2 1/2 hears and they are starting to think about tying the knot. She lives with her roommate, Katie, and has 2 cats, Bob and Rufus. She working in the marketing department of a high volume airplane parts manufacturer in Everett, 20 some miles north of Seattle. Her hobbies include dancing, mountain biking and snowboarding. She loves going to the movies. She also loves to shop.

Web usage

Her Internet usage is limited mainly to work related functions and E-mail. She has a hotmail account for her personal correspondence and uses it almost every day at lunch and sometimes on weekends or eves. He has shopped online but only a few times, she often finds the process confusing. Because of how she needs to use the Web at work she has a pretty good grasp of how most things work, she considers herself fairly savvy as she uses a mailing list program and spends a bit of time on marketing type sites. She doesn't enjoy spending a whole lot of time on the computer, so she prefers to get on and off quickly, and likes those sites that help her do that. Sara likes it simple and straightfor-ward.

Online shopping

As far as shopping sites goes, she likes Amazon, and Nordstroms, but doesn't have a whole lot of experience with others. She uses these mainly for gifts and would prefer to hit the mall or downtown before resorting to shopping online. Often times she may look for some information about a particular product online and then go pick it up (or not) at the store. Most of her shopping experiences have been limited to research and information gathering. When she has made a purchase she finds that sometime the process is a bit overwhelming.

Persona: Jane King

Computer Savvy
***

Web Savvy
***

Online Shopping Savvy
****

Background

Jane is a 33 year old entrepreneur, she runs a small boutique in downtown Seattle selling jewelry, clothing and shoes. She is married, has no children (yet) and lives with her husband, Brian, a mortgage banker in a Bellevue condo. She is tall, thin and has dark hair and light eyes. She spends most of her time at work or working on the condo, which they bought and moved into earlier this year. When she has free time she loves to read, travel and catch some live jazz.

Web usage

Jane uses the web quite a bit. Her store has a website so she does her best to make sure that it's up to snuff. She has an old college friend who has his own freelance Web design business do the maintenance for her. The site has a shopping cart application, that while it's no Amazon, works fairly nicely and thus far the site has meant quite a bit to her business. She also spends lots of time checking out other similar sites to hers and keeping up on news and that sort of thing. She gets quite a bit of email, too much spam however, and wishes that the Web in general were a safer, less intrusive place. But she can't knock what it's done for her business. She doesn't get too many sales, but lots of referral calls and interest. She sees her site as a marketing and advertising vehicle more than a store front at this point.

Online shopping

As she has a vested interest in online shopping she spends as much time (and money) as she can shopping on the internet and has noticed marked improvement in the process over the years. She still thinks there is lots of room for improvement, but likes where it's going. Her biggest frustration is returning or exchanging of items. Personally she likes the actual experience of going down to the store and touching the goods, but can't deny the convenience of shopping online. She views it as the future of her own business, but doubts it'll ever replace her shop. In other industries, but in the clothing and jewelry business there is a need to have contact with the items.

Personas for New Book: *Designing for Aging Population*

Carolina

Carolina, 52, works as a music therapist for a veterans' hospital in the US. She also teaches folk dance at her local community center. Carolina moved to the US from Latin America when she was a young adult. Although English is not her first language, she obtained her Master's Degree in Art Therapy from a US university. Carolina must use digital technology at work, but all too often she struggles with its complexity. She sometimes has to ask for help from her co-workers and even from some of her clients. Still, she finds that she knows more than some of her clients, whom she helps with relatively simple things such as making online appointments, finding and downloading items from the web, and interpreting health information.

Personas for New Book: *Designing for Aging Population*

Wong

Wong, 70, and his wife live in a small apartment near their son, daughter-in-law, and grandson in a small city in China. He enjoys playing *Xiang qi* (Chinese chess), practicing *Qigong*, and spending time with his family. Wong uses a desktop computer to keep track of his appointments, reports, news, and financial transactions. He uses his smartphone mostly for phone calls but also for weather, transportation, and some social networking. He tried to use a *Xiang qi* app on his smartphone but had trouble seeing and manipulating the very small objects on the screen.

Personas for New Book: *Designing for Aging Population*

Hana

Hana, 68, is a retired business manager in Japan. She and her husband have two children and four grandchildren. Their daughter and her family live nearby; their son and his family live in the US. Hana enjoys spending time with her grandchildren, and she has taken up *ikebana* (Japanese flower arranging). She uses a tablet computer mostly for games and social media (especially Skyping with family) and a smartphone mostly for making calls. She's currently being treated for cancer, and has noticed that her medications affect her memory and concentration. Hana has always been a bit timid about digital technology. These days, she is completely reliant on her family for technical help, such as finding apps on her devices, remembering passwords, and changing settings.

Personas for New Book: *Designing for Aging Population*

John

John, a retired 80-year-old teacher, lives by himself in London. John currently donates his services to a migrant education centre. He loves to travel and visit his children and grandchildren. Staying in touch with family and colleagues means that John spends a great deal of time online. John has impaired vision; as a result, he makes extensive use of the visual magnification properties and audio capabilities of his digital devices. He recently purchased a tablet computer and hopes to make good use of it, instead of his smartphone, when he travels.

Persona "Quotes" in *Designing for Aging Population*

"If a website has lots of stuff moving around, I leave. I can't concentrate." – Carolina

"My phone has too many settings. I have no idea what most of them do." – Hana

"I don't always notice when something on the screen changes." – John

"Buttons and links are just so very small! It is not easy for me to select the correct one." – Wong

Profiles or Personas?

- How much detail do you need?
- Do you have user-representatives on your design/development team?
  - If so, you might not need personas
  - If not, you probably do

Questions?

Understanding Tasks

- *Decide* on task domain
- *Investigate* tasks
- *Study* tasks with users
  - You don’t understand task domain or work process
  - They don’t understand task-analysis or software design
  - They may not be sure how they work

Task Domain

- Goals: The various results people want
- Tasks: Activities to achieve goals
- Actions: Operations that together make up task

Questions to Answer by Task Analysis

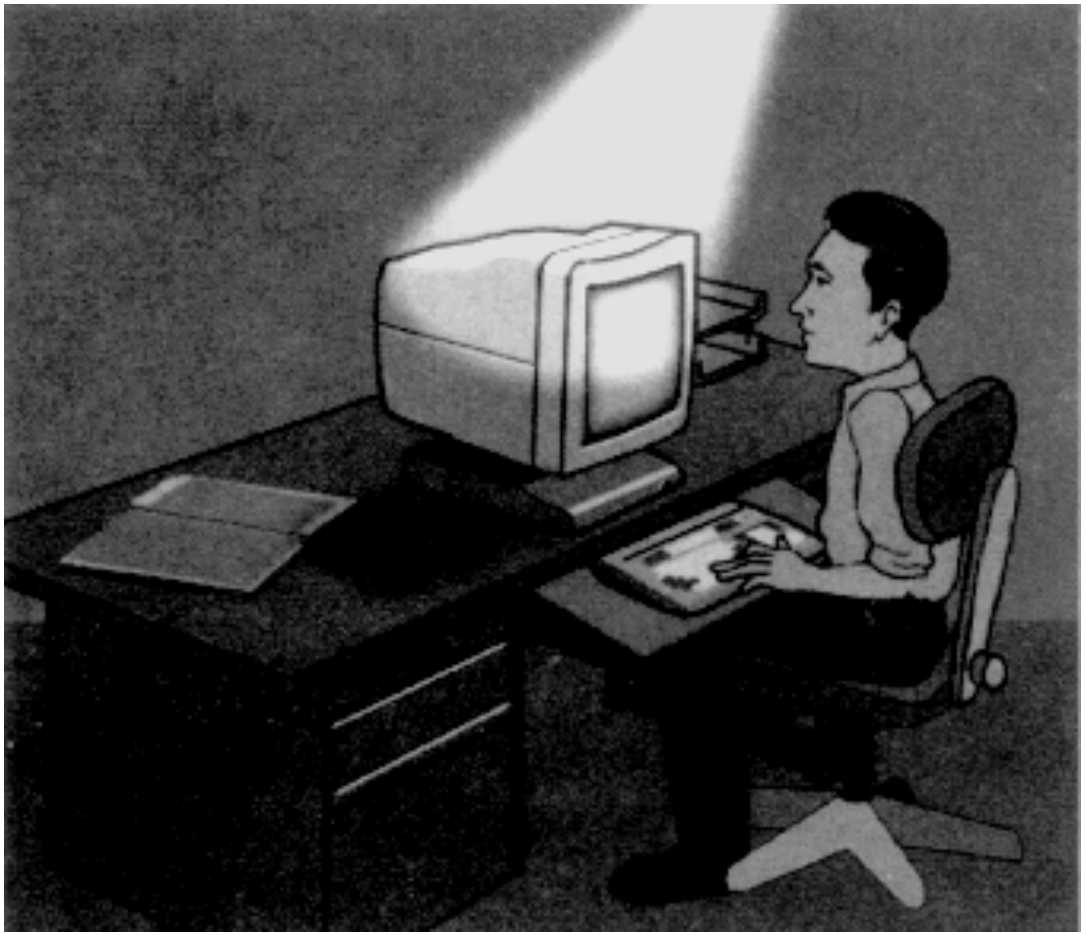
- What are users' goals? What are they trying to do?
- What tasks do users do to achieve goals?
- Which tasks are common *vs*. rare?
- Which tasks are most important?
- What are the steps of each task?
- What is the product of each task?
- Where does the info come from?
- Who does which tasks?
- What tools are used?

Task Characteristics

- Variability
- Frequency
- Knowledge/skill required
- Impact of environment
- Time critical?
- Safety hazards
- Solitary or group?
- Focused or multi-tasking?

Bad: Context-free Design

- Result: Long feature lists; poor flow



Good: Contextual Design

- Better solutions to users' problems

Task Analysis Methods

- Questionnaires: hard to do well
- Interviews
  - Face-to-face *vs*. phone
  - Structured *vs*. unstructured
- Focus groups
- Natural observation
- Study documentation

Choosing Methods

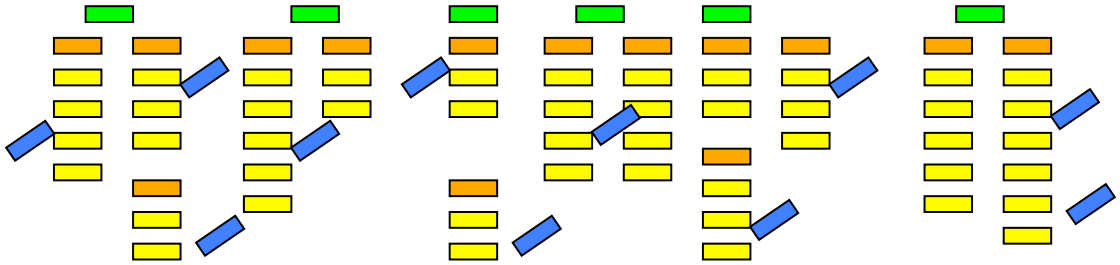
- Time available
- Location of users
- Type of users
  - Casual, occasional
  - Dedicated, trained, full-time
- Type of tasks
  - Office *vs*. field

Contextual Research

- Watch & interview users while they work
- Take notes; record audio or video
- Analyze paper notes, recordings
- Extract separate observations
  - Write each on a yellow sticky note

Contextual Research (cont.)

- Group notes into affinity diagrams



Observation **Group label** **Category** **Comment, idea**

Contextual Research (cont.)

- Create task-sequence models
  - Trigger, steps, sub-steps
  - For each user
  - Consolidate across all users

Example: Help Desk Opr.

Trigger: Get problem report

1. **Read report.**
2. **Try to reproduce problem.**
3. **If can't, request more details; If can, add description of how to reproduce.**
4. **Forward report to engineering.**

Example: Outline Task Analysis

To buy new pair of jeans:

1. Go to clothing store
2. Find pair of jeans
3. Pay for jeans
4. Return home

Example: Outline Task Analysis

To buy new pair of jeans:

1. Go to clothing store
2. Find pair of jeans
    - 2.1 go to jeans department
    - 2.2 find jeans you like that fit
3. Pay for jeans
4. Return home

Example: Outline Task Analysis

To buy new pair of jeans:

1. Go to clothing store
2. Find pair of jeans
    - 2.1 go to jeans department
    - 2.2 find jeans you like that fit
3. Pay for jeans
    - 3.1 take jeans to checkout
    - 3.2 pay for jeans
4. Return home

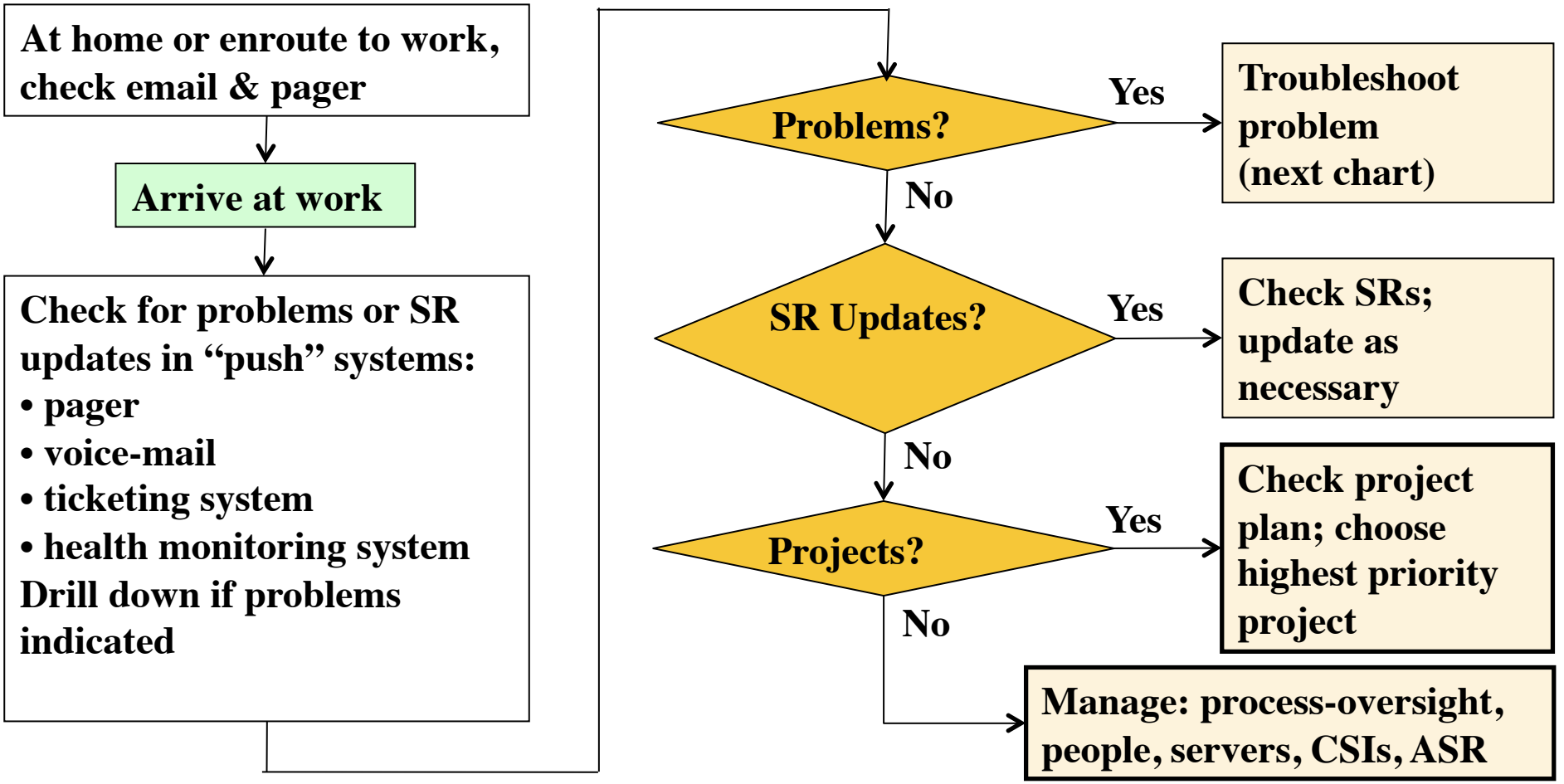
Example: Outline Task Analysis

To buy new pair of jeans:

1. Go to clothing store
2. Find pair of jeans
    - 2.1 go to jeans department
        - 2.1.1-a look through store
        - 2.1.1-b ask store employee
        - 2.1.2 enter jeans department
    - 2.2 find jeans you like that fit
        - 2.2.1 browse rack
        - 2.2.2 try on jeans with right size and style
        - 2.2.3 keep those that fit; put others back
        - 2.2.4 choose one pair from those that fit
3. Pay for jeans
    - 3.1 take jeans to checkout
    - 3.2 pay for jeans
4. Return home

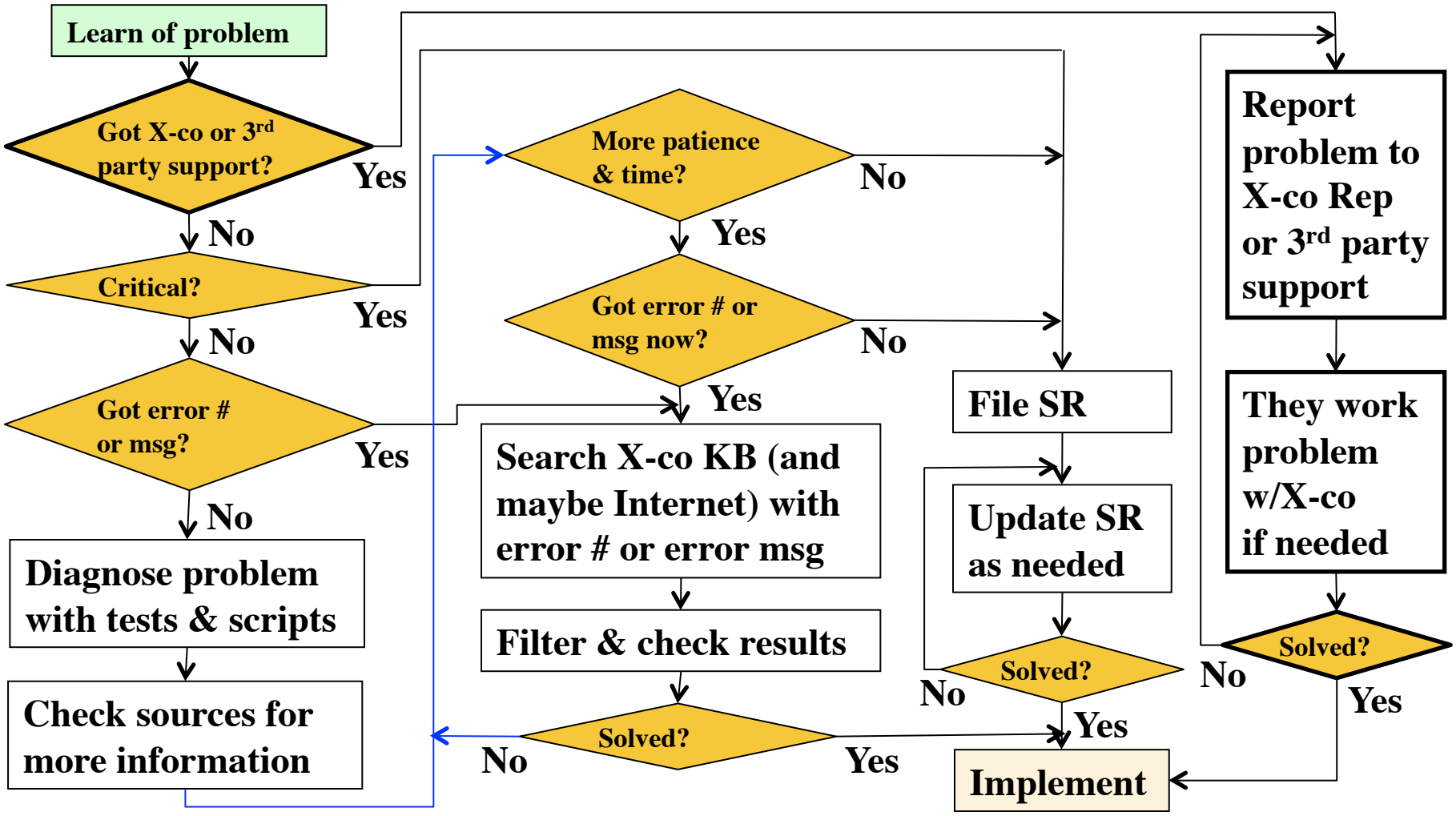
Task Sequence Model – consolidated

Server Sys Admin: Start of Normal Day

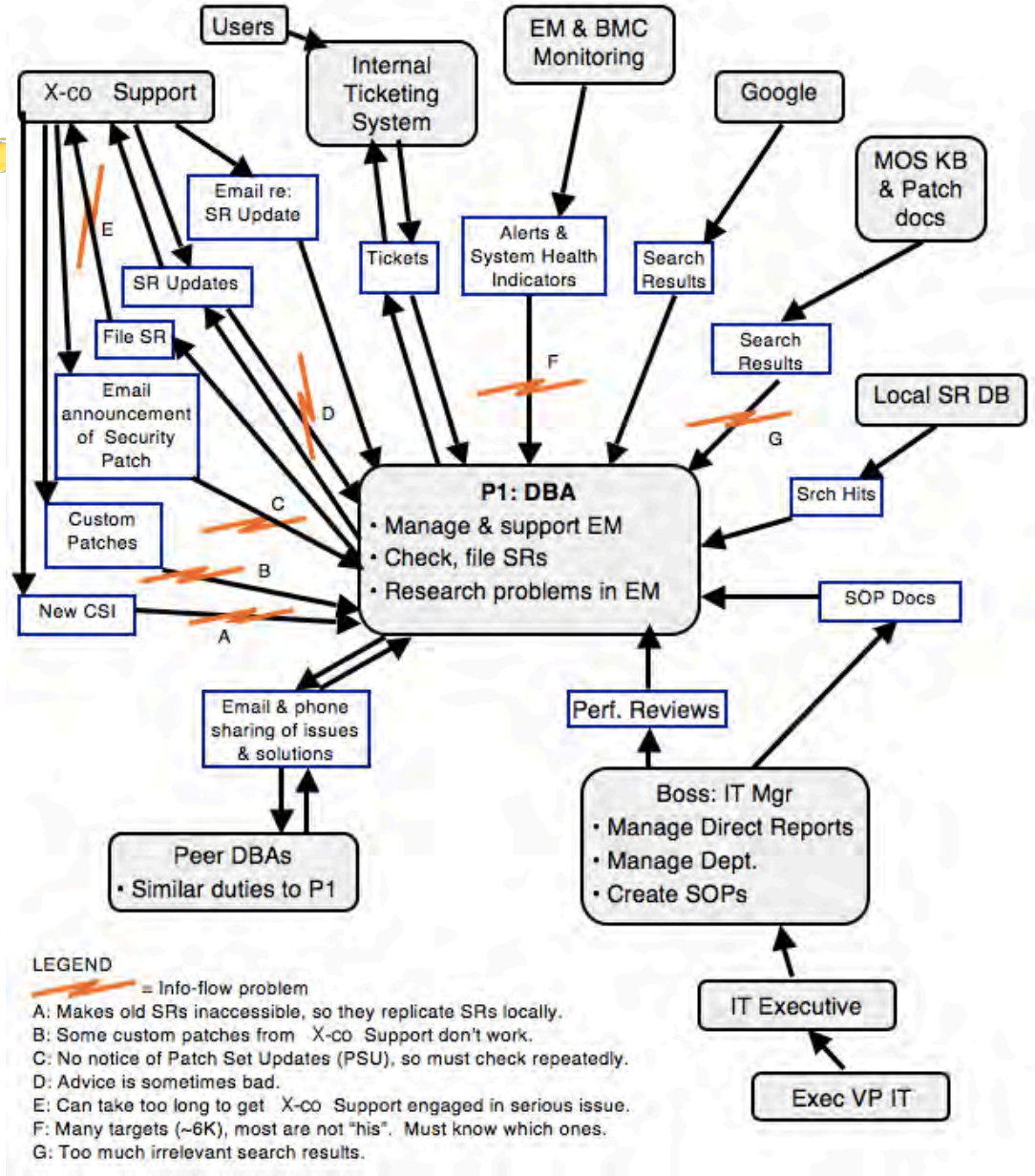


Task Sequence Model – consolidated

Server Sys Admin: Troubleshoot a Problem



Information Flow Model – individual



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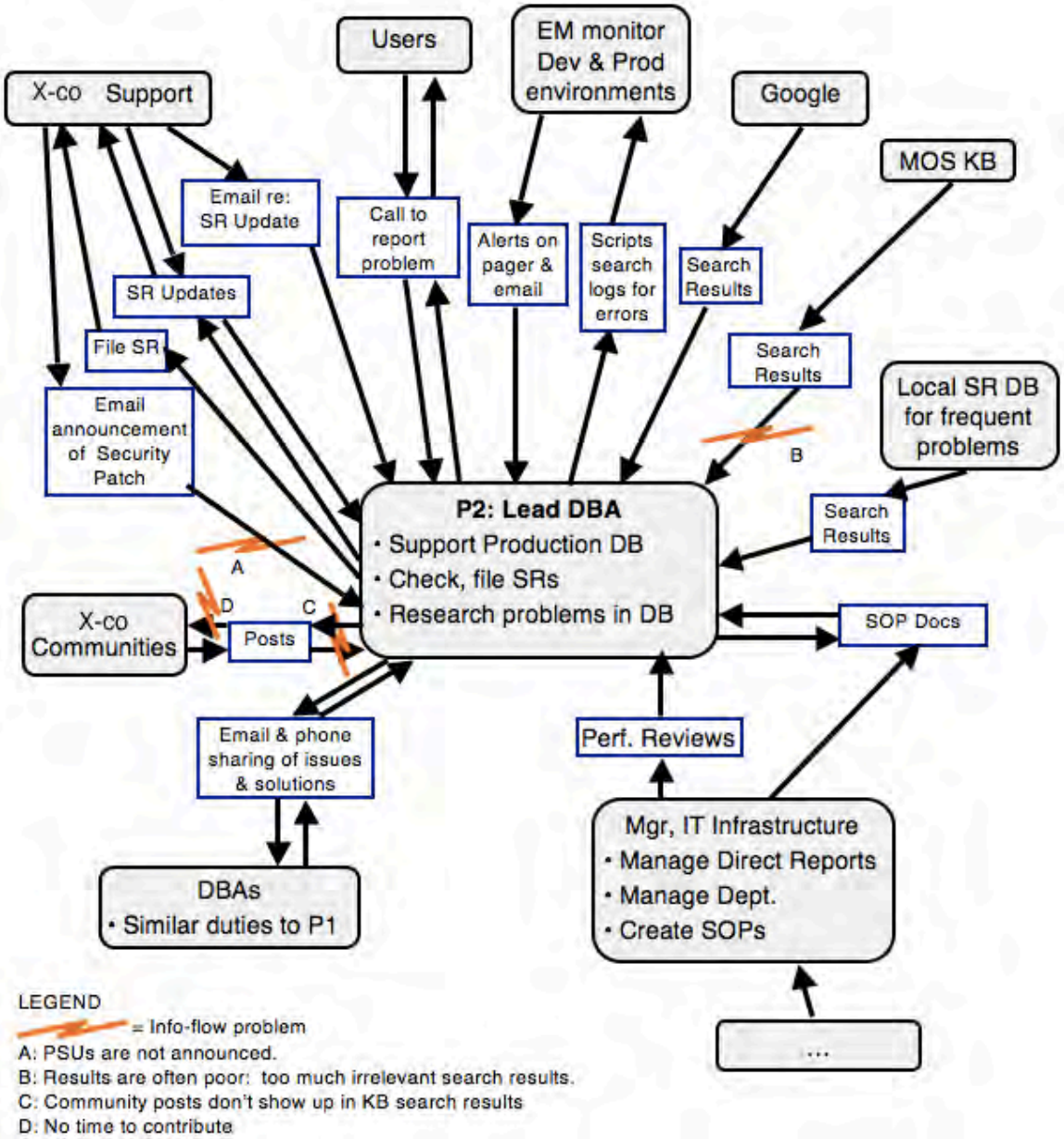

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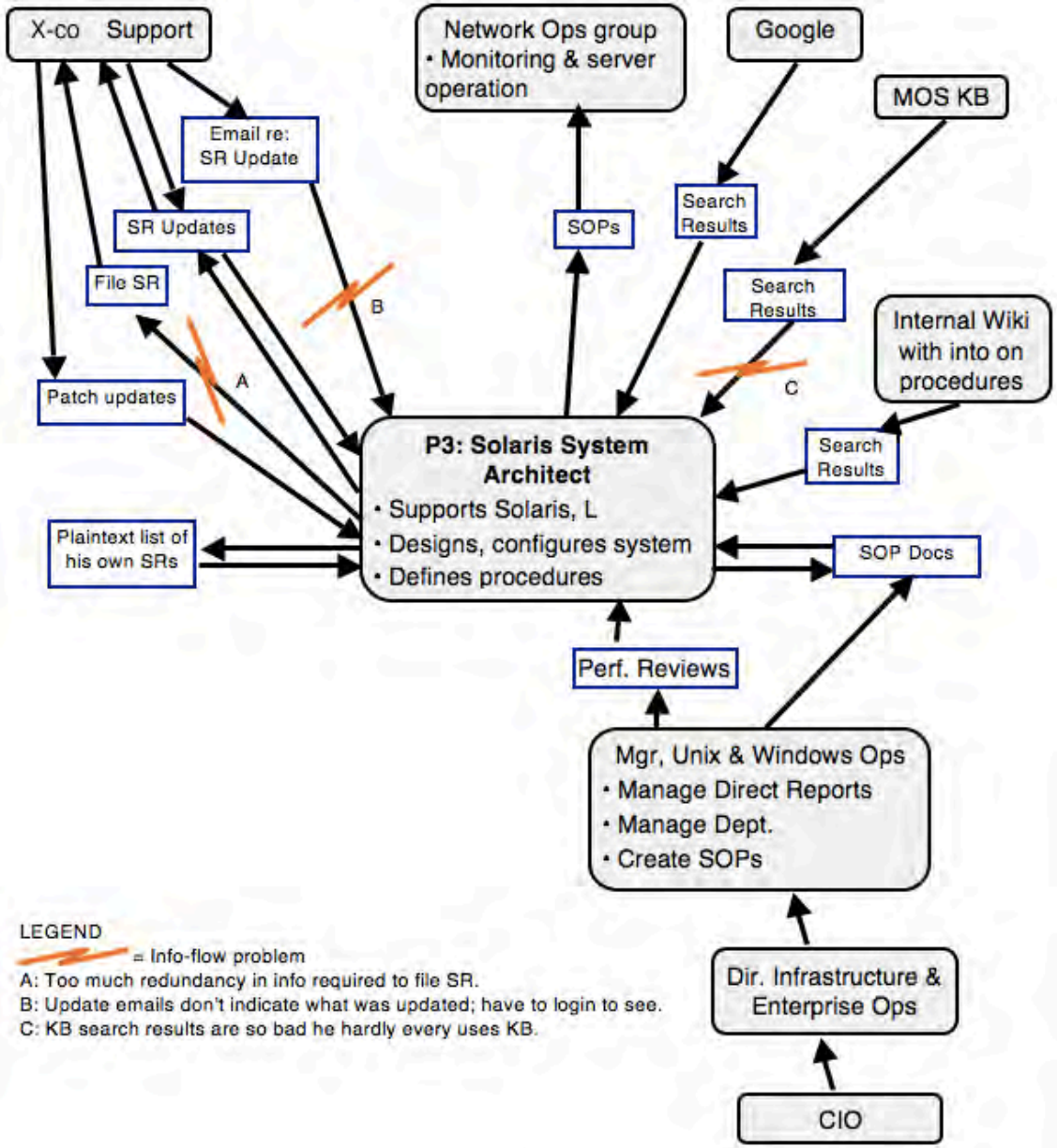

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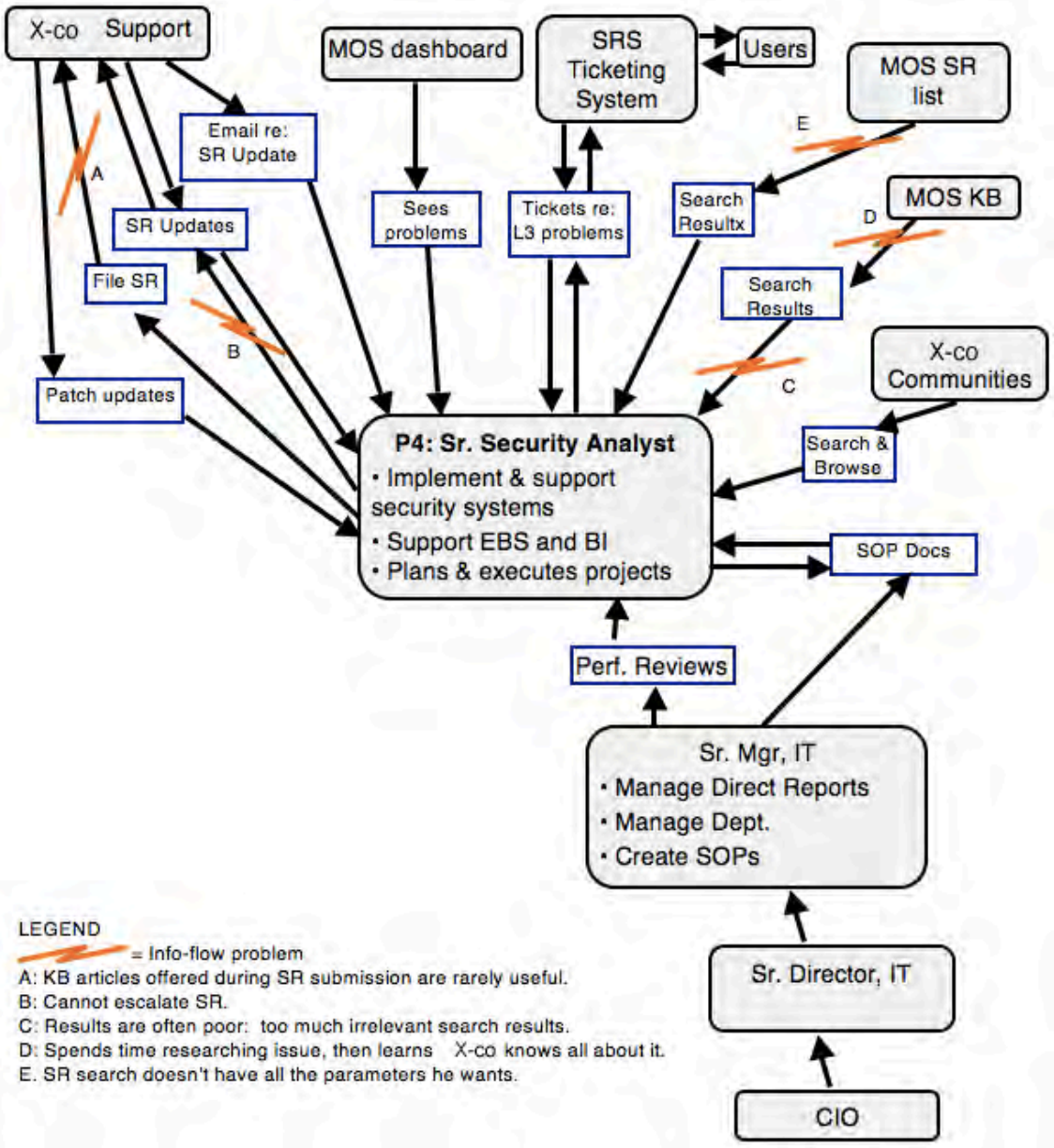

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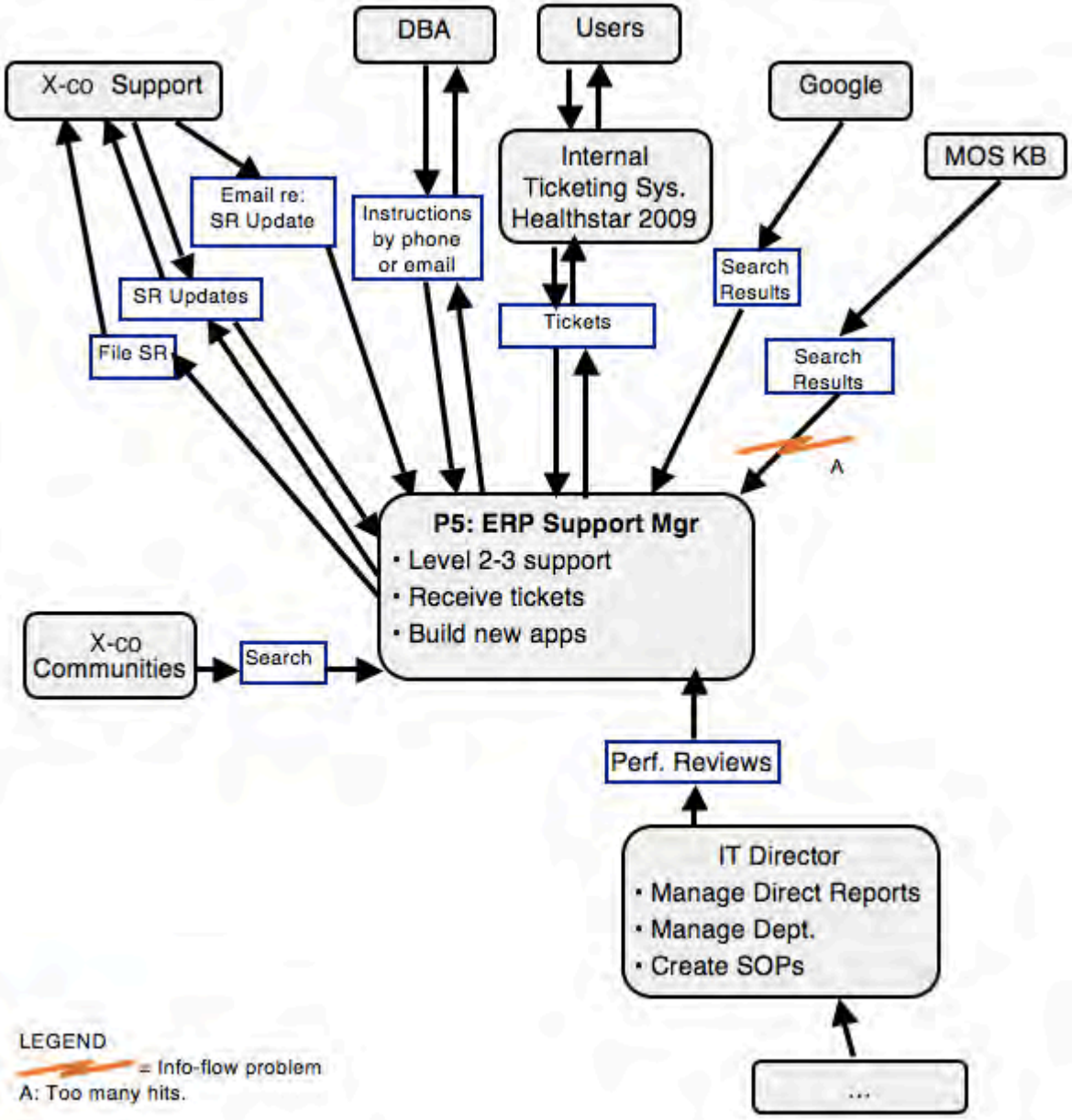

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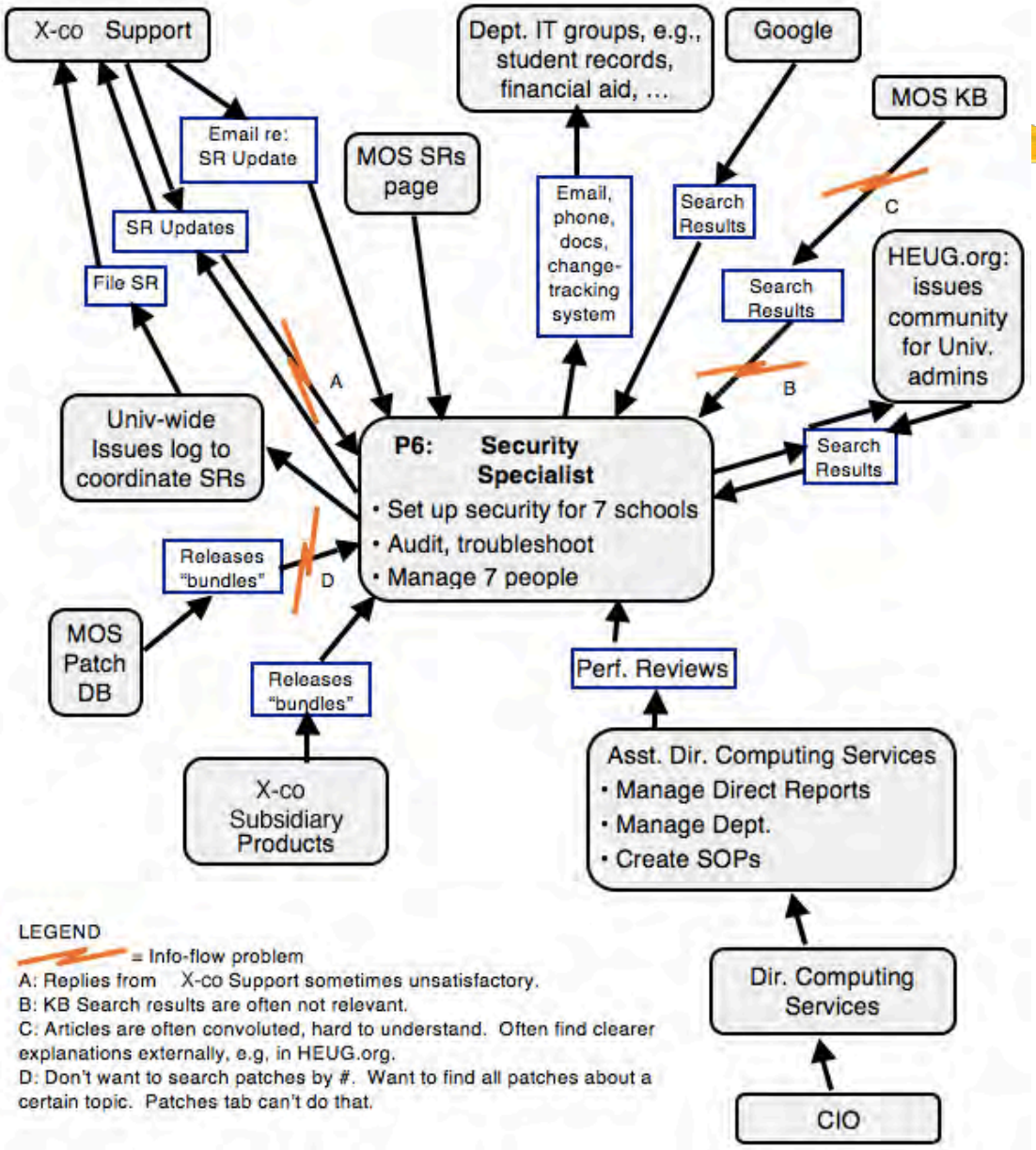

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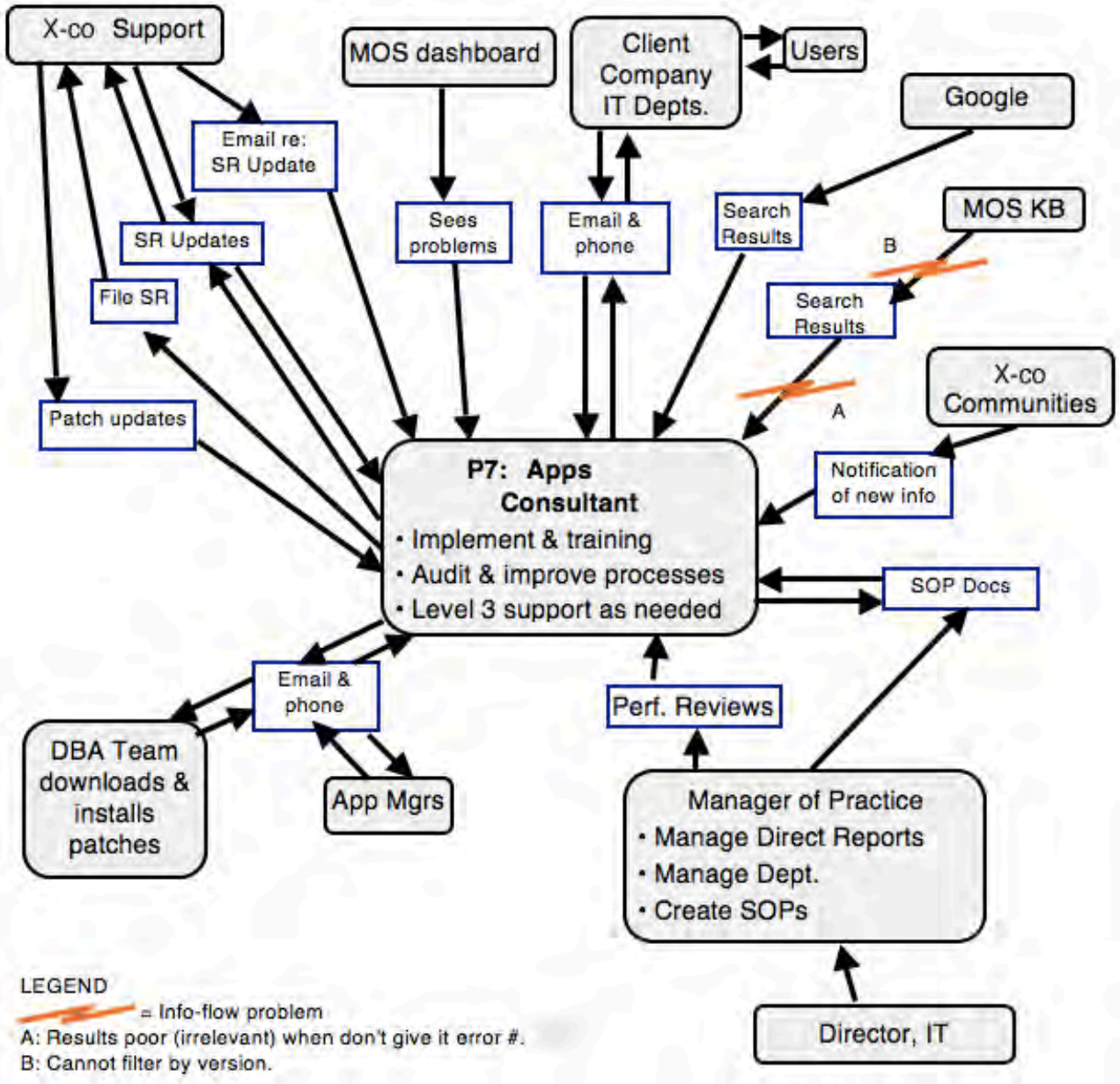
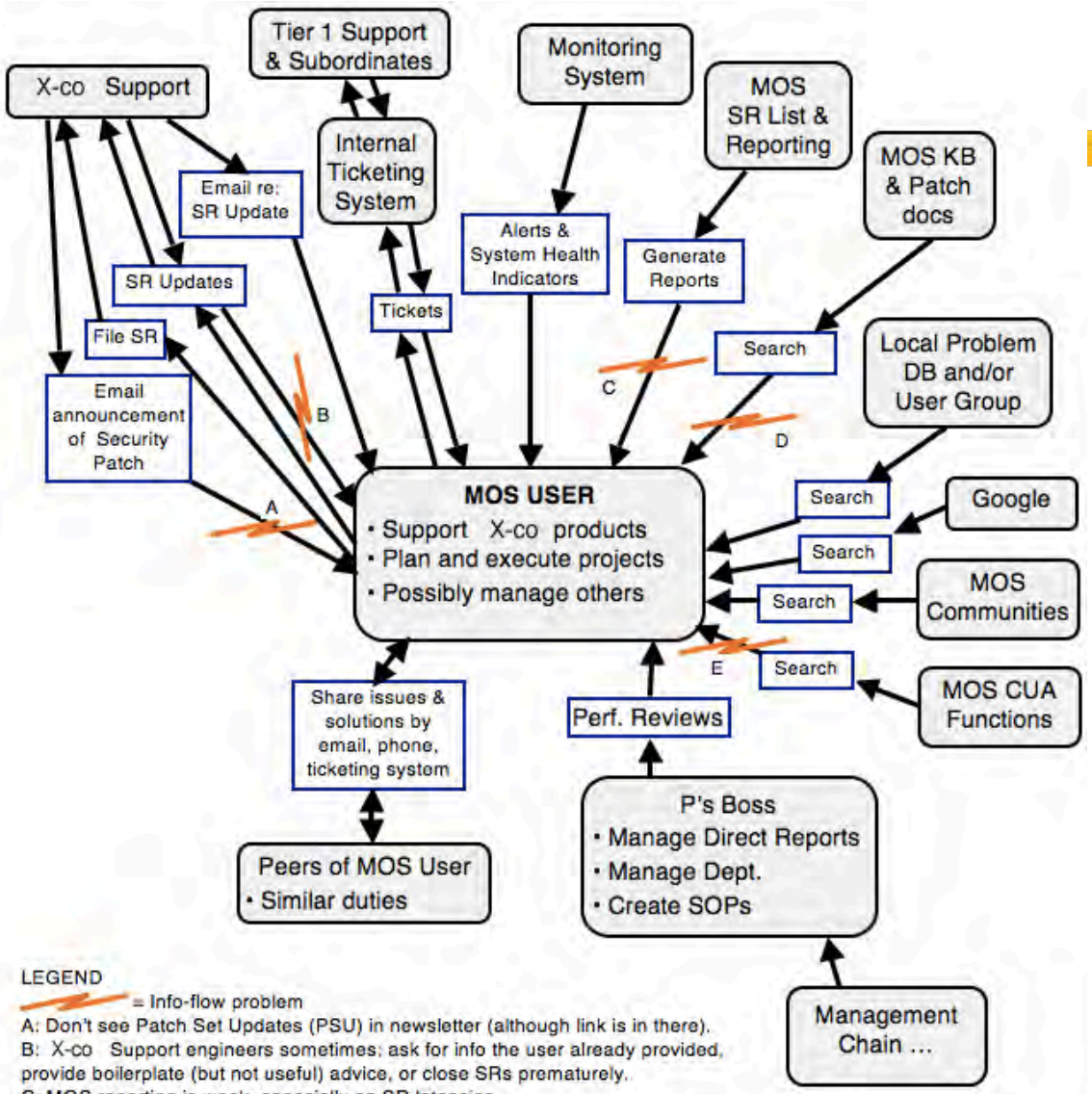
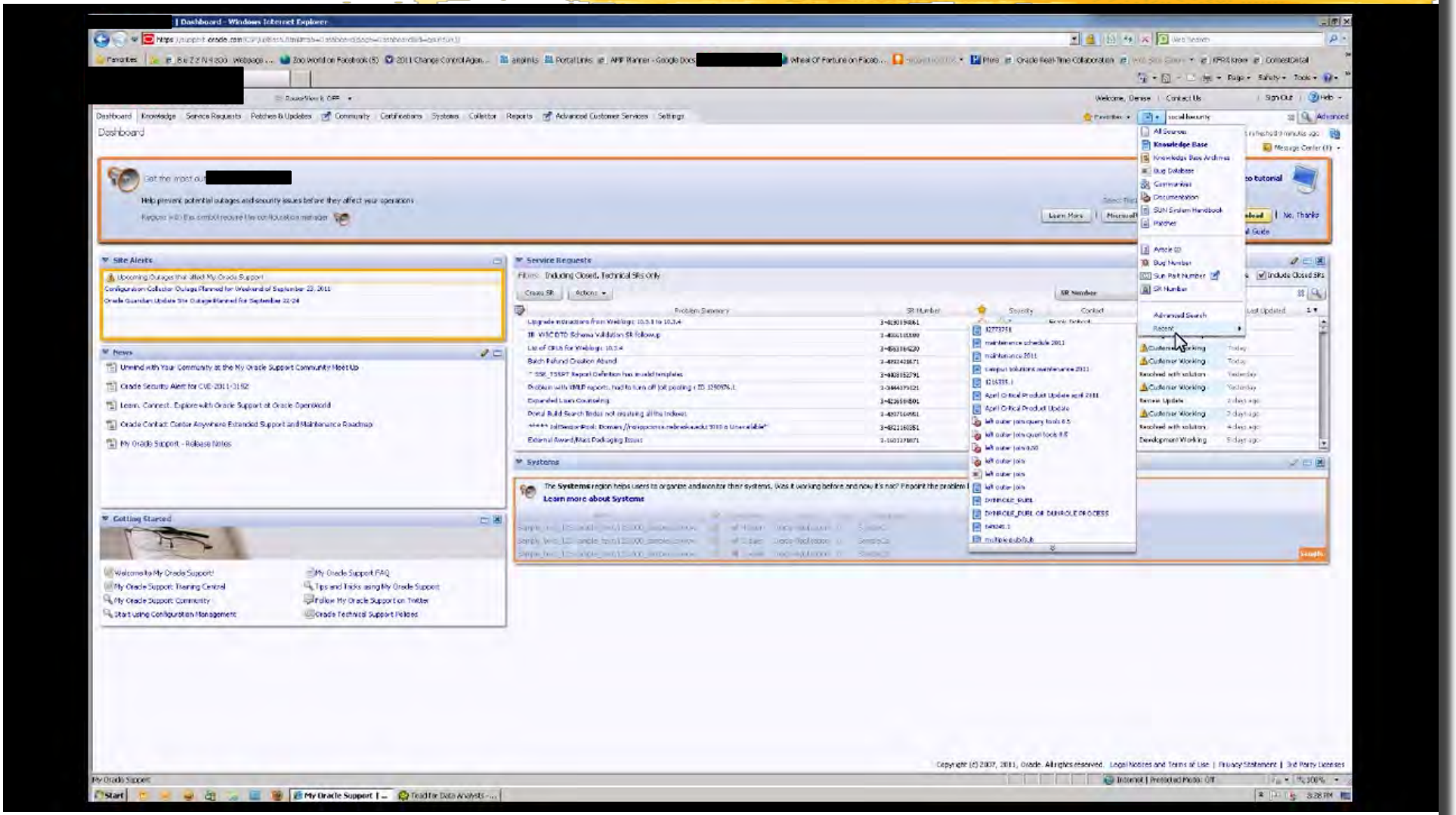


Information Flow Model – consolidated



Formative User Research:
Example Interview Clip



Formative User Research: *Examples of Problems Seen*

- Asset-management functions & graphs didn’t scale to sizes of customer systems
- Users more diverse (in job role) than anticipated
- Management of *who* can do *what* is problematic: problems in both directions
- Built-in search was poor: many users preferred using Google

Questions?