

BIOGRAPHICAL INFORMATION

David M. Stahovich
FLAME Change Management Lead
UGI Utilities

Specific Responsibilities

David Stahovich joined UGI Utilities in 1987. He is currently responsible for communicating the scope and vision of FLAME (Field Level Asset Management Environment) to the employees and contractors associated with the Gas Utility Division.

In his current role, David utilizes his 18 years of operations experience, his reputation and company intrapersonal relationships to communicate and implement a detailed change management plan for FLAME. This plan is focused on providing employees with clear, timely and honest information in a consistent and user-friendly manner. Basic change management methodologies are employed including monthly management and employee meetings, newsletters, and a UGI Utilities Intranet site highlighting FLAME activities.

In addition to his change management responsibilities, David's 18 years of operational experience provides the FLAME Team with a valuable resource in the areas of business process development, data conversion, systems configuration and implementation.

Past Experience

Prior to joining the FLAME team, David served as Superintendent of Natural Gas Construction and Maintenance Operations, where his most notable achievements included responsibilities of natural gas emergency response operations, UGI Utilities Media Spokesperson and company representative in bargaining unit contractual negotiations.

As noted above, David Stahovich has extensive natural gas operations experience. This experience includes Distribution Engineering - Design and Implementation, Engineer Technical Services - Gas Utility Standards and Compliance, Project Manager - Accounts Payable, Purchasing and Inventory Management business process enhancement and software implementation. Additionally, David actively participates as a facilitator of Human Resource employee development programs and as an employee recruiter.

Educational Information

B.S – Petroleum and Natural Gas Engineering, Pennsylvania State University
MBA – Finance, Saint Joseph's University

Professional Memberships

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AUTOMATED AND INTEGRATED CALL BEFORE YOU DIG

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ABSTRACT

UGI Utilities must respond to underground facility screening and location requests received from a centrally-run agency. Geospatial, mobile and web-based technologies are ideal foundations upon which to automate the process of receiving requests, screening against the GIS, dispatching wirelessly to work crews and communicating results via the internet. By leveraging commercial geospatial products and mainstream integration technologies, UGI is poised to greatly improve efficiencies and provide enhanced safety to customers and the general public.

BACKGROUND

UGI Utilities, Inc. is a natural gas and electric utility headquartered in Reading, Pennsylvania. The company is a wholly owned subsidiary of UGI Corporation of Valley Forge, Pennsylvania. The Gas Division is a local natural gas distributor serving approximately 370,000 customers in 14 counties of Pennsylvania. Its service territory includes the cities of Allentown, Bethlehem, Easton, Harrisburg, Lancaster, Lebanon, and Reading. This service territory is divided up into four primary operating areas. Each operating area has an office and is responsible for all gas operations performed in their area.

In Pennsylvania the Pennsylvania One Call System (POCS) is a government sponsored organization whose purpose is to prevent damage to underground facilities. In order to promote safety POCS provides a communications network among designers, excavators, and facility owners. Being a facility owner in the state UGI is required by law to respond to POCS requests and determine if any UGI facilities are in the location where a caller (contractor, home owner or designer) plans to dig.

Each year UGI receives approximately 100,000 requests (called tickets) from POCS. Approximately 50% of these tickets require a UGI field crew to make a trip to mark their facilities at the location of the pending dig.

The process for responding to these tickets was a manually intensive one. Each UGI operating area was responsible for responding to locate requests in their own area. The tickets were received via a fax and then a clerk had to identify the location of the dig and manually research the area by pulling out hard copy maps of the area. If the clerk determined that there were no UGI facilities in the area, they placed a phone call to POCS to indicate that the area is '*clear*' of UGI facilities. If the clerk determined that there may have been facilities in the area, they created a work order in the UGI work management system, made copies of maps and the POCS ticket and then contacted field personnel who would then perform the marking of the UGI facilities. After the marking was complete, the clerk contacted POCS to indicate that the area had been '*marked*'.

VISION

As noted above the process for responding to these tickets was very manually intensive. It was obvious that the whole process could be dramatically streamlined. The specific changes to the process that UGI decided to enact include the following:

- Automatically receive and log the incoming requests
- Electronically screen the request against the corporate GIS system
- Automatically create a work request in the work management system if a locate must be performed and then have that sent to the field by a dispatcher
- Give the field crews electronic maps with which to see the facilities in the field
- Geographically map dispatched work orders at the field level.
- Allow the work crews to enter the results of their work using a field unit.
- Electronically relay the results back to POCS

The above process would allow UGI to handle the locate requests much more efficiently. However, given the nature of the work, it was paramount that the new process not only be efficient, but be accurate as well. The safety of anyone digging is the primary concern and could not be compromised by any process automation.

THE FLAME SYSTEM

In 2003 UGI embarked upon the Field Level Asset Management Environment (FLAME) project. UGI had a corporate GIS system that they used to track all of their gas facilities. The goal of the FLAME project was to make this GIS data available throughout the company, especially to the users in the field.

The primary focuses of FLAME are to:

- Deploy Field GIS units to personnel in the field,
- Implement a Graphic Work Design product that would be tightly coupled with the GIS,
- Move textual data from mainframe systems to the GIS system.
- Capture data in the field, at the source, thus reducing the dependency on paper records and the manual entry of this data.

As part of the FLAME project UGI decided to implement their vision for a more efficient POCS response system.

FLAME ONE CALL BUSINESS PROCESS

After the overall FLAME business case was accepted by corporation management, the first step in its implementation was to redefine the specific business processes that would be put in place with the new technology being deployed. Twelve core business processes were reviewed and redefined based on the availability of the GIS data and the new technology. One such process was the One Call business process. The redefined business process is shown in Figure 1 below.

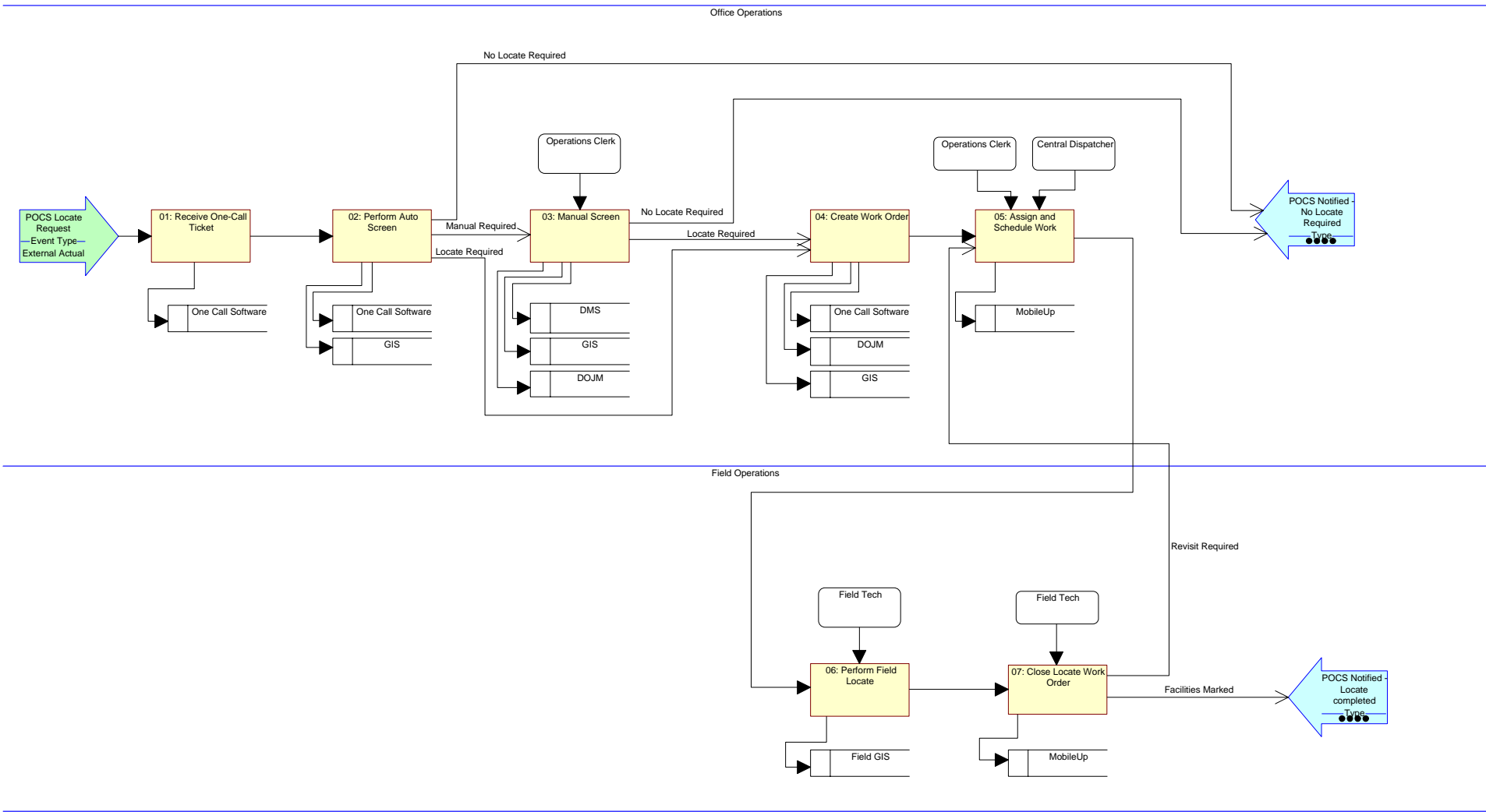


Figure 1: FLAME One Call Business Process Chart

The FLAME One Call system has a number of critical success factors:

- Safety; no locate requests can be misclassified as CLEAR when there are really facilities in the area.
- 100% of the POCS tickets must be processed on time.
- Overall operational efficiencies are realized by the company.

In order to achieve these success factors, the FLAME One Call system relies heavily on the following:

- Positional accuracy of the GIS data is extremely important.
- Currency of the GIS data is extremely important. The timing of land data, design data and as-built data into the GIS is critical to success.
- Timeliness of responding to the POCS requests is critical. Routine requests must be responded to in three days and emergency requests responded to in three hours.

With these factors in mind the FLAME One Call Solution was implemented. Each step in the overall process shown in Figure 1 is described below.

Step 01: Receive One-Call Ticket

POCS tickets are received by FLAME via email. FLAME monitors a standard email account for new tickets. Once tickets are received they are parsed and any fields necessary for automated processing are placed into an Oracle database. The entire ticket contents are stored in a document management system (DMS) so that office and field personnel can review at a later date if the need arises.

The automated process also has built in audit checking to ensure that all tickets sent by POCS are indeed received and processed by FLAME.

The incoming tickets one of three types: Routine Excavation, Emergency (Gas odor/damage) or Design. The tickets are one of four actions: New, Update, Renotify, or Cancel. The state transition diagram in Figure 2 shows the logic that is used in processing the POCS tickets.

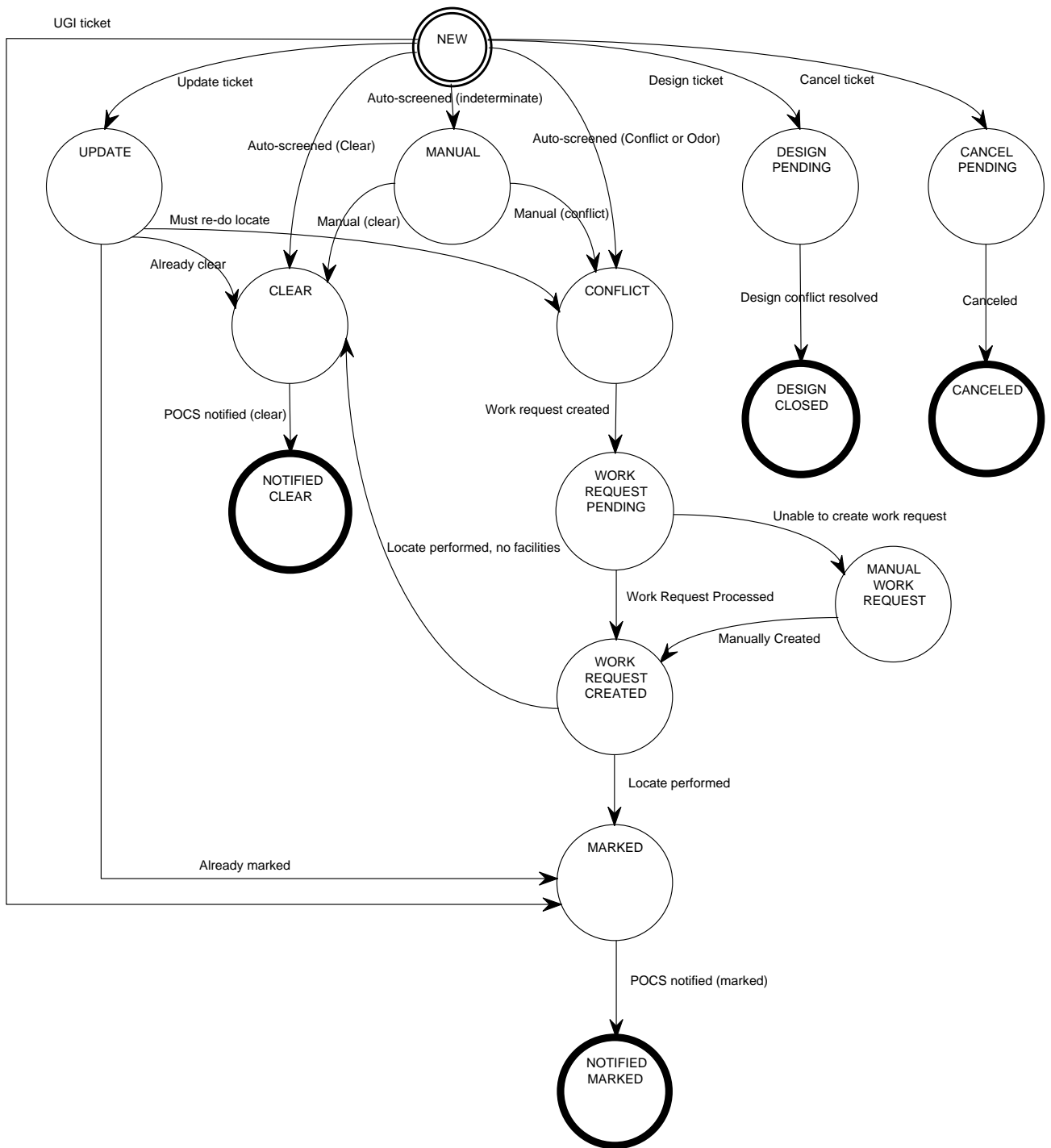


Figure 2: POCS Ticket State Transition Diagram

Step 02: Perform Auto Screen

Each POCS ticket indicates the location of the proposed dig by including latitude/longitude coordinates and an address. FLAME uses this information to screen against its corporate GIS. The process incorporates two buffers around the dig location. If any facilities are found within the first buffer it is necessary for UGI to have field personnel mark those facilities. Thus a work request is created within the UGI work management system (DOJM). This is performed automatically without any manual intervention.

If there are no facilities detected within the first buffer, but some are detected within the second buffer, FLAME places this ticket into a queue for manual resolution.

If no facilities are found within either buffer, there is no need to for a field visit. In this case POCS is notified of the CLEAR status. This notification is made via a web service.

The choice of buffer sizes is key to the efficiency and accuracy of the solution. They must be chosen to take into account the following factors.

- Accuracy of the UGI landbase compared to the POCS coordinates
- Accuracy of the UGI facility data relative to their landbase
- Location and length of service pipe that is not represented in the GIS

Choosing buffers that are too small will result in possible misclassification of tickets as CLEAR when a field locate is actually required. Choosing a buffer size that is too large will result in the cost of field trips that are not really required. In the interest of safety the decision was made to err on the side of making the buffers too large rather than risk them being made too small.

It should be noted that based on past history 50% of POCS tickets result in a CLEAR status. Using the above automation the majority of this 50% will never require any human interaction. Further, of those tickets that do require a field locate, the majority will not require any human intervention, as both the determination of the need for the field work and the creation of the DOJM ticket are automated.

Step 03: Manual Screen

Whereas in the past all POCS tickets were manually screened, now only a small subset of these tickets requires manual screening. And where in the past the manual screening was done by looking at hard copy maps, the manual screen is now performed by looking at the online at the corporate GIS data.

The manual screening interface is a web based application. It contains a view into the current GIS database. Upon logging in, the office clerk is presented with a list of those tickets that are assigned to them. This assignment is based on operating area. The

application allows the clerk to navigate in the GIS to the area of the locate request. They can view the entire ticket contents from the DMS. They can also view attribute information of the facilities in the area. And they can view scanned service cards (stored in DMS) by clicking on any service object in the GIS.

If they determine that a field visit is required, with the click of a button a DOJM work request is created and subsequently sent to dispatch. If no field visit is required, FLAME will automatically notify POCS that the area is CLEAR of UGI facilities.

Step 04: Create Work Order

The creation of the DOJM work request is automatic. In case there is not enough information in the ticket to create a work request automatically, FLAME requires the operations clerk to manually enter a DOJM work request.

Step 05: Assign and Schedule Work

In the past locate work requests were assigned by having the operations clerk make a phone call to field personnel. Now the work requests are handled by the UGI dispatching department. This gives the company greater flexibility in assigning work requests. The locate order is assigned to a qualified employee in order to complete the locate request in the most efficient manner. Emergency locates will be dispatched immediately by the dispatcher or central dispatcher to someone already in the field. Routine work will be batched overnight and assigned to a crew each morning (93% of locates). Additional efficiencies are gained by grouping the locate order with other maintenance work (e.g. valve inspections).

At UGI dispatching uses mobile technology. Work requests are sent over a wireless network to personnel in the field. The FLAME solution will provide the POCS ticket as an attachment to the work request thus eliminating any need for field personnel to come into the office.

Step 06: Perform Field Locate

The field personnel receives the notification to perform the locate request. The entire POCS ticket is available to the field personal through the mobile dispatch system. The field personnel will have a Field GIS unit in their vehicles, thus they do not need to use hard copy map books in order to determine the general area in which facilities exist. They have access to the GIS data as well as access to service cards and other scanned documents that reside in the corporate document management system.

The process of performing these locate requests is optimized by having up-to-date facility information, rather than possibly outdated hard copy maps. Field access to the GIS and DMS data results in a great reduction of clerical support time and field locating time associated with questions and inquiries pertaining to records.

In a future release of the Field GIS system the field personnel will be able to redline the GIS data and the document management system images in case any data inaccuracies are detected.

Step 07: Close Locate Work Order

The field technician closes out the work order from the field, using MobileUp. While closing the work order the field technician can indicate that a revisit is required, in which case a work order is automatically created. Closing the work order will trigger the appropriate response to POCS.

FLAME ONE CALL SYSTEM ARCHITECTURE

The key products involved in the solution are shown in the following table:

Technology	Product
GIS	Smallworld
Web-based GIS	Smallworld Internet Application Server
Field GIS	Mapframe
Dispatch and Mobile Work Management	MobileUp
Document Management System	Documentum
Database	Oracle

The following integration mechanisms are employed:

Type of Integration	Product or Mechanism
Data Integration	DB2 Information Integrator
Internet Integration	Email and web services

Figure 3 illustrates the FLAME One Call System Architecture.

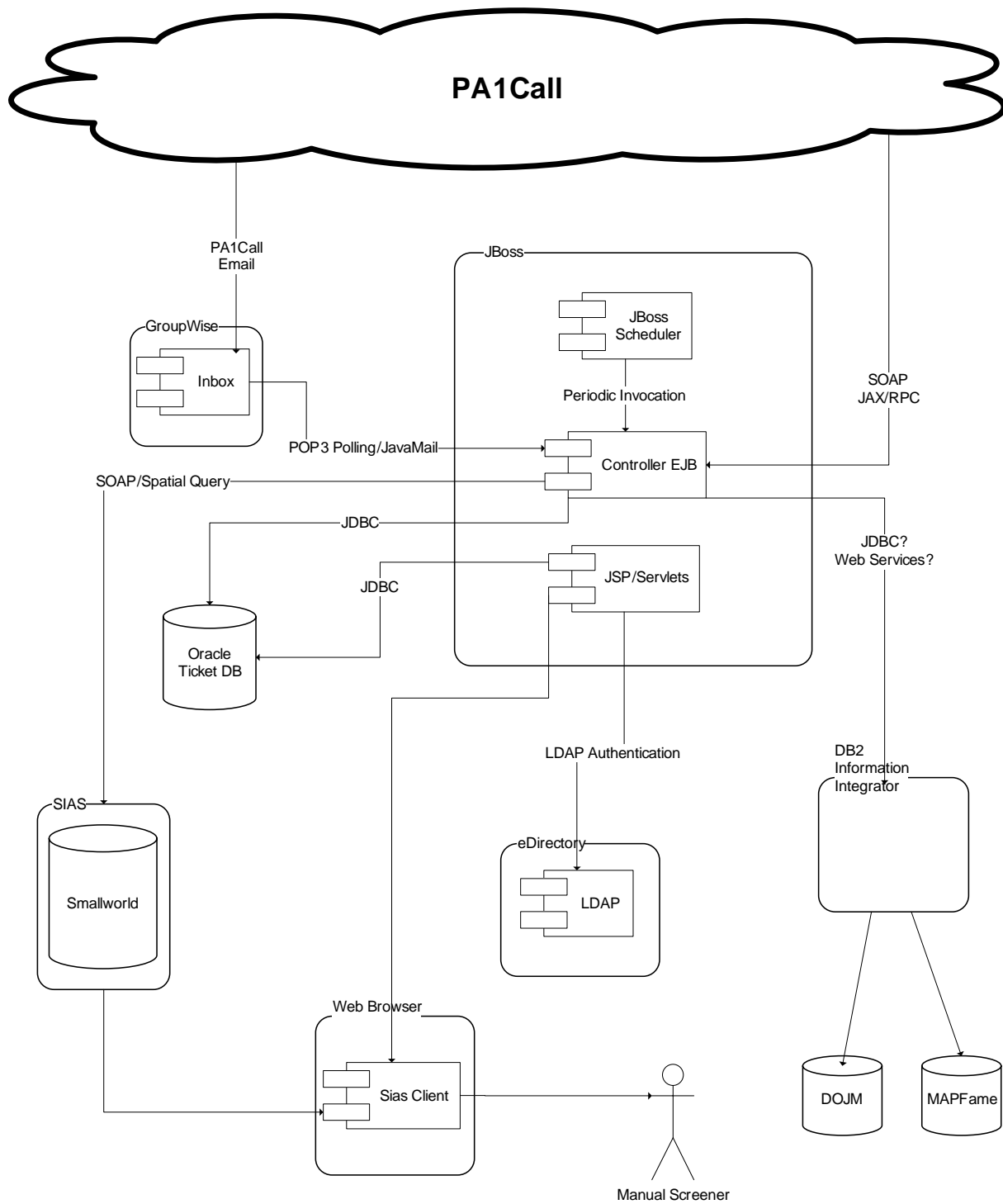


Figure 3: FLAME One Call System Architecture

CONCLUSION

UGI Utilities recently completed the PA One Call Application rollout in the Gas Division. Although it is early in the implementation stage, current indications are pointing at favorable process which will produce the benefits originally projected.

(Insert slide here depicting current progress and conclusions based on the implementation of the Pa One Call Process).

The scheduled implementation date for this program is February 14, 2005.