



## Best Practice: Integrating and monitoring heterogeneous technology systems

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**CITY: TEL AVIV-YAFO**

**POLICY AREAS: TECHNOLOGY**

### BEST PRACTICE

Tel Aviv-Yafo developed an information technology system that monitors asynchronous interfaces between heterogeneous systems, allowing for automatic monitoring across systems that would otherwise require manual intervention.

### ISSUE

The Municipality Information Technology (IT) platform is Service Oriented Architecture (SOA) compliant and uses primarily new Middleware technologies to interconnect many heterogeneous systems in a loosely coupled fashion. The platform's systems and applications are fully integrated and support most of the on-line requests from each of the consumer's applications, internal and external. However, many systems are continually running in a batch fashion and are participating in complex workflows, in order to allow for collaboration on operational business processes. Those complex workflows consist of several batch activities based on a number of different platforms, which are based on various technologies. Each one requires specific training and expertise. With these kinds of complex interfaces, it has been nearly impossible to correlate each batch with another. Monitoring a complex workflow of this nature requires different skill sets and specialties, making it extremely difficult to get a comprehensive view of all the running processes simultaneously. In case of any kind of system failure, different kinds of experts are required to analyze the problem and find a viable solution to it. This operation had to be done manually by someone with expertise in each concerned system until NETA ® Monitoring System was born.

### GOALS AND OBJECTIVES

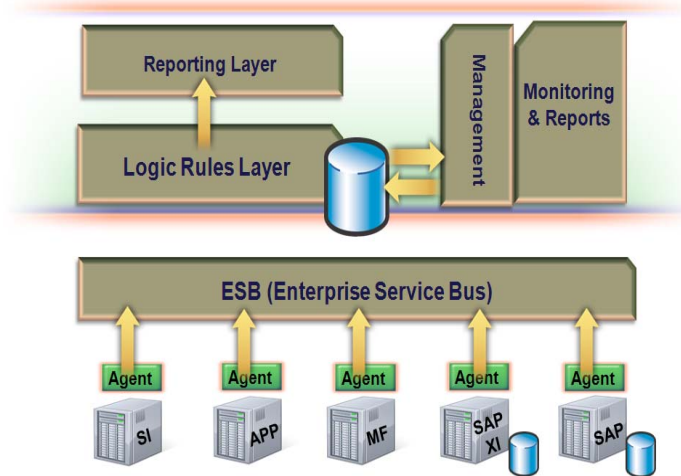
In 2008, Tel Aviv, Yafo Municipality, began searching for out-of-the-box solutions for monitoring the batch processes that were running as part of complex interfaces. Correlating batch processes, which had no means for establishing a logical relation between them, proved extremely challenging. To better understand the disparate nature of these systems, consider that each autonomous system launches its own activities in accordance with its own scheduling and has its own administrator. This clearly illustrates the complex nature of the challenge of monitoring activities in autonomous systems that are not correlated. Throughout the search for state-of-the-art technology to monitor and integrate these processes, these challenges proved to be insurmountable with the current resources, preventing the use of any existing product.

To gain a better understanding of the scope of the NETA ® Monitoring System's development process, the reader should consider that in Tel-Aviv Yafo Municipality, there are more than 5 major core IT systems which are not designed to participate on a correlated asynchronous workflow (SAP Abap, UC4 Batches, Mainframe COBOL Programs, SAP XI Rfc and Proprietary systems). Each system generates serial processes called "Activities". Each activity, after completion, will relay to the next activity which is pre-programmed, continuing through the workflow until the process reaches its end-point (completion).

NETA ® Monitoring System will correlate each phase of each specific workflow across all "activities" and report the completion of the processes in a real-time fashion.

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Figure I - NETA ® Monitoring System layers



### IMPLEMENTATION

The NETA ® Monitoring System is based on standard programmatic agents standing on each platform which are raising batch processes. These agents report, in an asynchronous fashion, events to the System Engine. The heart of the NETA ® Monitoring System is in charge of correlating each batch with another one that uses business rules logic since there is no possible correlation between the batches which constitute the various processes.

Each Batch is considered by the system as a “process station” called an "activity". Each "activity" can run several batches at the same time. The NETA ® Monitoring System Engine will correlate each batch with another using a “set of logical keys”. These keys are standing, logical rules that analyze the behaviors of each of the processes.

The system consists of clients' agents and a Central Monitoring Console which displays all the workflow processes in real time through a graphical interface. The operator can easily locate information for the running processes across the various platforms. NETA ® Monitoring System reports any trouble for each system (un-availability) and any errors reported by a process activity.

The NETA ® Monitoring System allows the Municipality Helpdesk administrator to follow the Municipality's critical processes in real time. This permits him/her to react to problems on-line and correct the batches' flows, maintaining SLA's of Municipal services.

Additionally, NETA ® Monitoring System reports any issues to Business Managers, so that they can maintain and improve the quality level of services they provide to residents.

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### COST

The whole project, from its Architecture phase, through the detail design phases of the client and the server sides: development, tests, and deployment to a production environment, was issued by the Integration Technology and Methodology Dept. of the Tel-Aviv Yafo Municipality.

This Dept. employs about 10 specialists, each an expert in his respective field. They bear the responsibility for all of the Department's various projects. The project costs were incurred while this team was also tending to other ongoing projects.

### RESULTS AND EVALUATION

Today, NETA ® Monitoring System is an integral part of the Tel-Aviv Yafo Municipality production platform and enables the Department of Information Technology to provide service of an extremely high caliber to residents.

NETA ® Monitoring System won the Israel IT-AWARDS for 2010. It was deemed the best monitoring system because of its advanced technology, the reasonable cost of maintenance, and the quality of service it provides.

### TIMELINE

- January 2009      Establishing strategic requirements for a monitoring system with batch processes orientation.
- February 2009    Checking market product offers.
- April 2009        Designing the high level requirements of the Neta system
- August 2009      NETA ® Monitoring System Project Kick-off
- August 2010      NETA ® Monitoring System version 1.0 born and passes tests and Q&A stages
- October 2010     NETA ® Monitoring System is released in its final version using Microsoft BizTalk 2009, Silverlight and most of the clients agents required for the Municipality platform.

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### LEGISLATION

N/A

### LESSONS LEARNED

NETA ® Monitoring System has been conceptualized, designed, created, and implemented in a short span of time because of the effective employment of the SOA methodology and the appropriate, existing Governance technologies (ESB and OEP "One Entry Point" Lightweight Bus).

### TRANSFERABILITY

NETA ® Engine can monitor any platform (including old mainframes) using existing agents, NETA ® Agents SDK and its Framework.

### CONTACTS

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