: Is it feasible to track all visitors to the United States and then build a Data-driven DSS?

In response to the September 11, 2001 World Trade Center and Pentagon attack, the U.S. Congress required Attorney General John Ashcroft and the U.S. Immigration and Naturalization Service (INS) to develop a plan for a National Security Entry-Exit Registration System (NSEERS). The first phase of NSEERS was implemented by the U.S. INS at selected ports of entry throughout the United States on September 11, 2002. After an initial 20-day period for testing and evaluating the system, on October 1, 2002 all remaining ports of entry -- including land, air and sea -- will have the system in place (see 08/12/2002 release). This Ask Dan! discusses the transaction processing system called NSEERS and the prospects for decision support that may result from implementing the system.

When fully implemented NSEERS will be operational at more than 100 airports and 200 land and sea ports of entry. In a June 6, 2002 statement, Attorney General Ashcroft called the initiative "a vital line of defense in the war against terrorism." Ashcroft outlined three components of NSEERS:

· Fingerprinting and photographing at the U.S. border

· Periodic registration of aliens who stay in the United States 30 days or more.

· Exit controls that will help the Immigration and Naturalization Service to remove those aliens who overstay their visas.

Ashcroft asserted on June 6, 2002 that "with new technologies, we are able to perform a quick fingerprint check at the border that takes only three minutes to complete."

NSEERS is a massive information systems project. For both political and technology reasons it seems that the system may not capture the same data for all visitors.

In assessing the feasibility of the system, I developed a list of questions:

1. What decision support is needed?

2. What data should be stored by NSEERS?

3. How large would a comprehensive database need to be to track all visitors to the U.S.?

4. What architecture would one create for real-time data entry and access to information in such a database?

I'll briefly share my answers to these questions, feel free to suggest additions and to challenge the assumptions I have made.

First, decision support is needed at the border to determine if a person should be admitted to the U.S. and in some cases allowed to leave. Currently the plan does not provide for gathering and checking fingerprints and taking photos of all visitors to the United States. My guess is that the technology is not in place for such an ambitious undertaking. Political concerns may also be slowing down such universal data gathering. Decision support is also needed by INS and Law Enforcement agents to enforce immigration and visa regulations. Finally, decision support is needed to help

prevent terrorist attacks. Knowing what types of analyses and reports will help law enforcement spot illegal activity is not clear. How can suspicious patterns in entry and exit be spotted? What exception reports should be available and to whom?

Decision support capabilities will need to be developed. More decision support is need than lists of people who are unlawfully in the U.S. and many officials in INS, at U.S. embassies and at law enforcement agencies will need to query a National Security Entry-Exit Decision Support System.

Second, what data should be stored? Clearly some personal data -- name, address, citizenship, date of birth, height, weight -- needs to be stored; a photo and a thumb print. Then a "transaction log" of entries and exits needs to be maintained. For many visitors they will have only two entries in the log in a calendar year - an entry and an exit. Some frequent visitors at the Canadian or Mexican borders might enter and exit 5 times a week.

Third, the database would be very large. The transaction processing database will need to be loaded regularly (probably daily) into a data warehouse for analysis and decision support. According to FBI materials, it takes about 45 KB to store a single fingerprint. A photo of visitors would take about 10 KB. Personal information would take about 5 KB. For 35 million visitors, each at 60 KB of storage, that would equal 2.1 Terabytes per year. A data warehouse would probably need to store 5-10 years of data.

Fourth, the architecture will require communication with a centralized database for fingerprint comparisons, but it is possible to store some data at each port of entry and upload it in batches. Data entry hardware for NSEERS needs to be in place and network connections are needed at each port of entry. Multiple input devices will be needed at many ports of entry. Maintenance of the hardware at ports of entry can probably be outsourced. The software and hardware will need to scale to manage a very large database. The TPS database will grow rapidly and the query demands could become very demanding on the system once it has 5 to 10 million visitor records.

Is it feasible to track all visitors? YES. Will NSEERS be an easy TPS/DSS project to implement? NO. Implementation and OPERATION of the system must be managed with care and sensitivity. Visitors to the United States must be treated as guests and not as potential criminals and potential violators of our immigration laws. A good model for INS to emulate from the business sector is the customer relationship transaction and decision support system at Harrah's Entertainment. Harrah's tracks more than 15 million guests in its system. That is only about one fourth to one half the number of people that may be in NSEERS, but the scale is similar. INS will probably need to issue guest cards and INS may want to use the Mastercard/Visa system and card readers for periodic registration of visitors who are here for more than 30 days like international students.

References

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