

National Security Essay

The attempted bombing of Northwest Airlines Flight 253 by Umar Farouk Abdulmutallab on December 25, 2009 was widely reported by the national media as a failure of U.S. Intelligence community to connect the dots in a timely manner [2]. In an opinion piece that ran in the San Francisco Chronicle, the security expert and author, Bruce Schneier argues that the inter-organizational sharing of intelligence must be improved to prevent future intelligence failures such as that of the failed Christmas Day bombing [1]. While outdated information systems, fragmentation of the intelligence community and government bureaucracy may be partly to blame for the intelligence oversight, the real underlying problem is that of information overload. The term “information overload” refers to the difficulty, in terms of cognitive effort, to make a decision or understand an issue due to the mere presence of too much information [3].

Always at a silent war, modern day intelligence collection, occurs continuously, generating overwhelming amounts of data as a by product. Raw intelligence and signal data is collected via multiple platforms at multiple locations throughout the world every second of every day or every year. This data is captured and cataloged in various databases and information systems with the hopes that one day an intelligence analyst will be able to create actionable intelligence from this mass of data. The problem is that the important bits of intelligence are lost in the sea of unimportant noise like a proverbial needle in a haystack. It takes massive amounts of manpower, resources, and time to sort through all of this data and filter out the really important details. This is a textbook case of information overload.

Information overload is not just limited to the intelligence field. Anyone who has tried to find a good movie to rent or has attempted to decide on a book to purchase has realized that the vast number of options available makes the choice of selecting the right product difficult. The difference between the Department of Defense and the retail industry is that e-commerce companies such as Netflix and Amazon.com have pioneered the use of recommender systems to reduce the cognitive burden experienced by the consumer from information overload [4]. For example, after the user specifies star ratings for enough films in Netflix, the website will recommend “movies you'll love” by comparing the ratings of the user to the previous ratings of other customers in the system in a process called collaborative filtering.

The collaborative filtering systems elicit input such as individual preferences or opinions from multiple users in an attempt to algorithmically determine similar users or items [5]. The items deemed most similar to a particular item being searched for can then be recommended to the user in an effort to reduce the search costs and improve information retrieval. These systems harness the collective wisdom of the community to reduce information overload and become more accurate as their usage rate increases.

The concept of recommender systems can be applied to the intelligence field in several ways. For example, in addition to determining the credibility of sources based on a table or matrix of criteria, multiple people who have viewed the intelligence or interviewed the source could give their own ratings for the source. These combined ratings could then be used to create an aggregate estimate of reliability.

Collaborative filtering could also promote the sharing of intelligence by helping users find subject matter experts within the Department of Defense. Additionally, reports and other intelligence products

could be recommended to analysts based on one report's similarity to other reports in the system.

Arabic names are difficult to translate into English and have many spelling variations. In addition to recommending name spellings based on phonetic pronunciation, frequency based collaborative filtering techniques could also be used to recommend spelling variations and improve search results.

Another use of recommender systems would be to nominate persons of interest for inclusion into watch lists based on that person's similarity to other persons currently on the list. This same principal could also be employed to recommend whether an individual should be allowed or denied base access.

A final example of recommendation systems would be to automatically identify geographical areas for surveillance, such as areas that share characteristics with known IED emplacement locations.

In order to reduce future intelligence oversights like that of Umar Farouk Abdulmutallab, the Department of Defense should work towards finding ways to not only improve information sharing but to address the fundamental underlying problem of information overload within intelligence community. Because intelligence data is collected continuously, it is not practical to just hire more people to analyse the data. Instead, effort must be taken to reduce information overload by finding ways to automate or partially automate the process of intelligence analysis. Recommender systems that utilize collaborative filtering techniques, like those currently used by business and industry, support automation can be implemented within the intelligence field today to reduce information overload and prevent future intelligence failures.

I request this essay to be published on the Lint Center for National Security Studies, Inc website with my name published.

1. Schneier, Bruce (2010), "Fixing intelligence failures", San Francisco Chronicle, January 15, 2010
2. Hosenball, Mark (2010), "The Radicalization of Umar Farouk Abdulmutallab", Newsweek, January 2, 2010
3. Yang, C.C.; Chen, Hsinchun; Honga, Kay (2003). "Visualization of large category map for Internet browsing". *Decision Support Systems* **35** (1): 89–102.
4. Schafer, J. Ben and Konstan, Joseph and Riedi, John (1999), "Recommender systems in e-commerce", Proceedings of the 1st ACM conference on Electronic commerce: 158-166.
5. Goldberg, David and Nichols, David and Oki, Brian M. and Terry, Douglas (1992), "Using collaborative filtering to weave an information tapestry", *Communications of the ACM* **35** (12): 61-70.