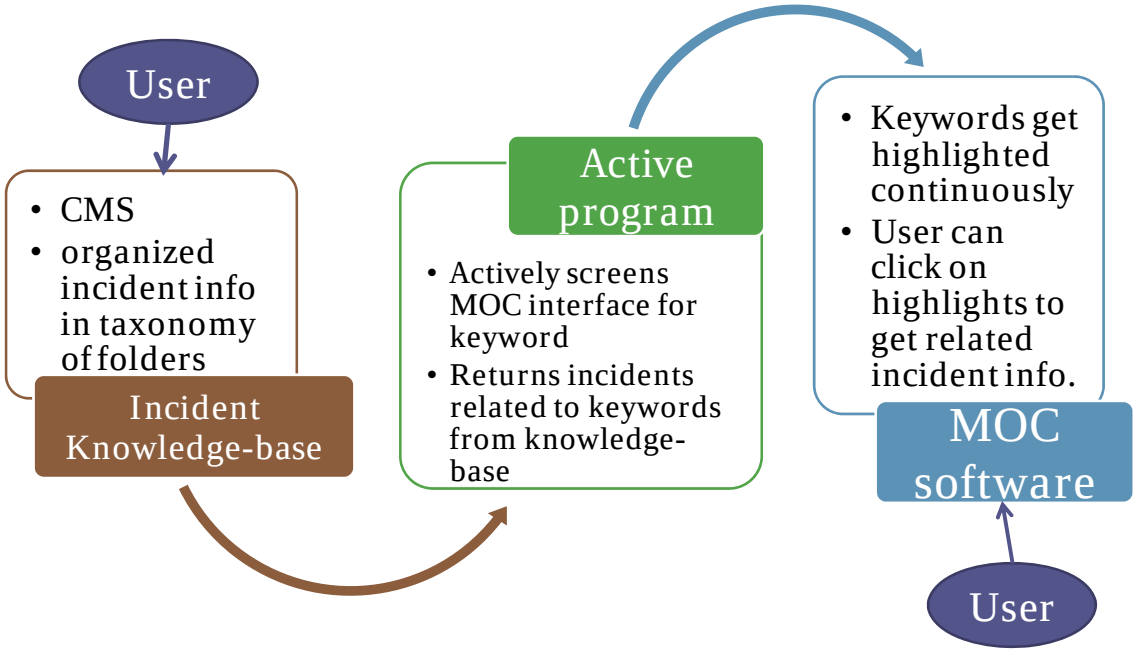
Active, Knowledge-based Process Safety Incident Retrieval System

In the context of potential hazards that exist in the chemical process industry, there are two categories of unawareness or lack of knowledge: the first is “knowing that you don’t know”, the second is “not knowing that you don’t know”. Both of these categories incur hazard, however the second is more undesirable, because it eliminates the opportunity to research, identify and react appropriately to reduce or eliminate the hazard (A.L. Sepeda). Therefore in improving process safety data systems, the objective of this research is twofold. The first objective is to improve the traditional database by including details on root causes and by simplifying the information retrieval process by using folder search as well as word search techniques. The resulting knowledgebase would benefit the research needs of users, who are already aware of the potential hazards of the process they are working with. The second objective is to make the incident information retrieval system ‘active’ to alert users of unknown hazards.
Integration of the knowledge-base with the active system is shown in this diagram.



Text mining methods are used to sort incident descriptions by categories, to identify keywords, and to find relationships among categories of incidents. The results from text mining are used to build an effective taxonomy. Incident documents are organized in folders and arranged according to the taxonomic hierarchy in a Content Management System (CMS), where users can retrieve information using the CMS folder search method.

To activate the CMS incident repository, an active program that is integrated to the CMS repository will be coded and run in the context of Management of Change (MOC) software. The active program is designed to screen the MOC software interface for some pre-defined hazardous chemical and process equipment keywords. If a match occurs, the keywords are highlighted in the MOC interface. The MOC user can then click on the highlighted keywords, which will trigger the program to return the incident

information related to the keywords. Using an active and knowledge-based retrieval system, people can learn from incidents and near-misses and will be more active to reduce the frequency of recurring accidents.