



THE INSTITUTE FOR COMPLEXITY MANAGEMENT
Making the complex simple

SCHOOL SAFETY WHITE PAPER

THE INSTITUTE FOR COMPLEXITY MANAGEMENT

The Institute for Complexity Management (ICM) is a 501 (c) 3 organization not for profit charitable organization. ICM has two divisions. One division is our John Galt Program for Investigative Studies (JGPIS). At JGPIS we conduct investigations of intractable social issues and maintain databases of information across a broad spectrum of societal issues including school safety. The second division is called the National School Collaboratory (NSSC). Our goal for the NSSC is to take the patents, trade secrets and ideas we have used successfully in the private sector and apply them to enhance the safety of our children at school. Both of these activities have dedicated web sites. You can visit the JGPIS site by clicking here: <http://www.jgpis.org>. You can visit the National School Safety Collaboratory by clicking here: <http://www.nationalschollsafetycollaboratory.org>.

WE HAVE A PROBLEM

As depicted in Figure 1, below, the Department of Justice reports that acts of school violence are increasing steadily. School incidents are occurring each day at all levels from K-12 to colleges and universities. No solutions have worked to curb school violence. Our goal is to apply new science-based innovative technology based on a patented process to make a difference.

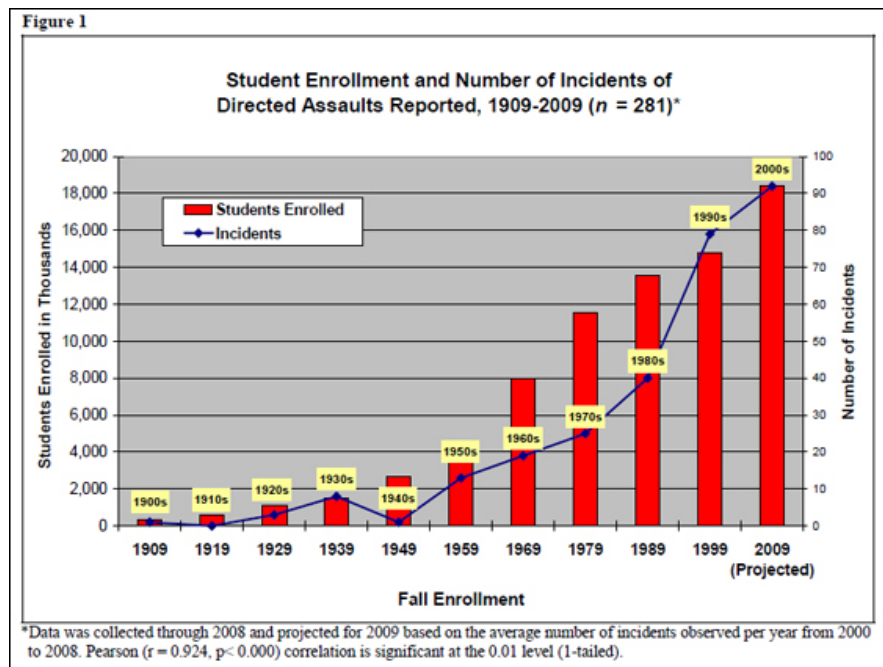


Figure 1: School Violence is on the Rise

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The recent measles outbreak, food adulteration, fires and arson at schools, cyber-bullying, sexting, suicides, terrorism and bombings are just a few of the other myriad of threats facing schools today.

THE NATIONAL SCHOOL SAFETY COLLABORATORY (NSSC)

The focus of this white paper is on our NSSC program. In 2008, we received a \$75,000 technology development grant from the State of Maryland. To prove our patents and trade secrets would work we developed a piece of risk management software to look across all aspects of school safety. The software was called School and CampusTQ with TQ standing for threat quotient.

In 2009, we decided to produce food risk management tools based on the School and CampusTQ prototype. We produced several pieces of software that are now being used by the Food and Drug Administration (FDA) to monitor the safety of the food we all eat.

This year we decided to pursue the deployment of school safety as part of an ICM non-profit public-private partnership that would rely on public and corporate donations to provide advanced school safety software to schools at little or no cost.

The software is revolutionary because it can, for the first time, assign science-based quantitative values to levels of risk to answer the question, “How vulnerable are we?” But it does much more than this. It also tells you based on science what you can do to reduce the risk associated with literally every kind of emergency that can occur.

SCHOOL AND CAMPUSTQ

COVERS 10 MAJOR CATEGORIES

The system works like this for School and CampusTQ. We started by looking across ten major categories of emergencies at schools K-12 and colleges and universities. The ten areas are depicted in Table 1, below.

1. Natural Disasters	2. Communicable Disease
3. Fires and Arson	4. Improvised Destructive Devices
5. Student Suicides	6. Transportation Safety and Security
7. Food Adulteration	8. Nuclear, Biological and Chemical Emergencies
9. Mass Shootings and Hostage Taking	10. Other Crimes on Campus

Table 1: Ten Major Categories of School Safety Concern

We scoured the World Wide Web for actual events in each of the ten categories and “reverse-engineered” them to ferret out what worked and what did not work in the real world. Based on this work we identified over 3000 school safety criteria.

We then placed the criteria into a large database and triangulated them to identify the least common denominators of emergency prevention and response that must be in place at schools K-12 and colleges and universities to defend against the range of threats for each of the ten categories.

FORTY-THREE CORE AREAS OF CONCERN

We identified through the process of triangulation the following 43 core areas of concern for schools K-12 and colleges and universities.

1. National Incident Management System	2. Relationships with first responders	3. Liaison with local law enforcement	4. Safety and security incident reports
5. Monitoring for copycat events	6. Interoperable communications	7. Communications protocols	8. Protocol to account for students, faculty and staff
9. Security measures to protect alarm, computer and communications systems	10. Access to medical assistance	11. Medical triage plan	12. Medical transportation
13. Grief and critical incident intervention program	14. Media protocol	15. After action reviews of incidents	16. Protocol for correcting safety and security deficiencies
17. Community relations program	18. Anonymous reporting	19. School policy on weapons	20. Searches for weapons, explosives and other contraband
21. Weapons violators	22. Recognizing and reporting threatening behaviors	23. Student referrals	24. Pre-admission reviews
25. Pre-employment checks	26. Foreign students	27. "Hot spots" on campus	28. Marking of boundaries and vehicle and pedestrian entrances and exits
29. School site maps, building plans and drawings	30. Key control	31. Student and employee identification system	32. Visitor control
33. Parking management	34. Lockdown procedures	35. Evacuation plans	36. Emergency drills
37. Physical security of facilities including lighting and barrier delay	38. Immediate emergency communication to students, faculty and staff	39. Emergency awareness training	40. Assignment of key personnel
41. Emergency notifications system	42. Loss of power	43. Facility shut down	

Table 2: Forty-three (43) Core Areas of Concern

EXPERT VALIDATION

Our next step was to bring together a team of experts to independently review our work. These experts were drawn from a pool of National Guardsmen under the direction of Lt. Colonel Jere Riggs (retired) of the Indiana National Guard. The team was selected based on their combat duty and their civilian jobs. Their civilian specialties included police officers, teachers, emergency management specialists, food specialists, and nurses. This work was conducted at Camp Atterbury and the Muscatatuck Urban Training Center. See: <http://www.atterburymuscatatuck.in.ng.mil/>. The military members of the team were augmented by a psychologist and two retired FBI special agents one of whom was a former hostage negotiator. The group then validated that the 43 core areas of concern in Table 2, above, were accurate and complete.

SPECIFIC AREAS OF CONCERN

From here the team validated areas of specific concern that must be in place at schools K-12 and colleges and universities (in addition to the core areas identified in Table 2, above) to defend against the range of threats for each of the ten major categories of concern as depicted in Table 1, above. These areas of specific concern are identified in Table 3, below.

Area: Communicable Disease	Area: Fire Safety	Area: Food Safety	Area: Improvised destructive devices	Area: Natural disasters
1. Preventing and limiting communicable disease	1. Fire safety plan	1. Food safety plan	1. Searches of delivery vehicles and large trucks	1. Natural disaster response plan
2. Basic hygiene	2. General precautions against fire	2. Food safety chain of command	2. Detecting vehicle bombs	2. Natural disaster chain of command
3. Liaison with public health authorities	3. Responses to fires	3. Liaison with public health authorities	3. Protocol for bomb threats and bombings	3. Weather and geologic event monitoring
4. Communicable disease "hotspots"	4. Installation and maintenance of building systems	4. Site specific food safety and security surveys	4. Initiating contact and negotiations with an individual threatening to commit a bombing	4. Types of natural disasters unique to the geographic region
5. Investigations of communicable disease	5. Material fire resistance	5. Limiting access to food storage, preparation and handling areas	5. School bombing "hotspots"	5. Shelter in place
6. Maintenance of health records including vaccinations	6. Fire resistant design and construction	6. Reliability certifications of food suppliers and food vendors	6. Bomb threats and response chain of command	6. Natural disaster awareness and training
	7. Safe escape design and construction	7. Inspection of food for signs of tampering or contamination	7. Bomb incident copycat events	
	8. Existence and placement of fire, smoke, and carbon monoxide alarms	8. Investigation of food tampering incidents		
	9. Fire "hotspots"	9. Inspection of food facilities by public health authorities		

	10. Student, faculty and staff fire orientations	10. Training for students, faculty and staff on food safety		
	11. Fire chain of command			
	12. Arson incident copycat events	11. Food incident copycat events		
Area: Nuclear, Biological and Chemical Emergencies	Area: Mass Shootings and Hostage Taking	Area: Student Suicide	Area: Other Crimes on Campus	Area: Transportation Safety
1. Nuclear, biological and chemical (NBC) emergency response plan	1. Protocol for responding to mass shootings and hostage taking incidents	1. Response plan for suicide emergencies	1. Response Protocol: Other Crimes on Campus	1. Transportation Emergency Protocol
2. NBC chain of command	2. Monitoring for cyber-threats	2. Suicide "hotspots"	2. Other Crimes on Campus Chain of Command	2. Student Accountability Protocol: Transportation Emergencies
3. NBC "hotspots"	3. Procedures for initiating contact and negotiations with a shooter/hostage taker	3. Accounting for students on campus	3. Other Crimes on Campus Awareness Training	3. Location of Buses in Use
4. Initiating contact and negotiations with an individual threatening to commit a nuclear, biological or chemical attack	4. Shooting "hot spots"	4. Recognizing the danger signals of suicide	4. Bullying	4. Bus Driver Communications
5. Searches for toxic materials	5. Mass shooting and hostage taking awareness training	5. Suicide crisis intervention	6. Investigation and reporting of sex crimes including rape and "sexting"	5. Safety and Security of Buses
6. NBC lockdowns and evacuations	6. School violence chain of command	5. Follow-up on threatened or attempted suicide	7. Crime hot line	6. Prohibition of Weapons: School Buses
7. Availability and administration of appropriate prophylaxis	7. Shooting/hostage copycat events	6. Suicide pacts	8. Cyber-bullying	7. Weapons Searches: School Buses
8. NBC chain of command		7. Media suicide protocol	9. Investigation and reporting of larceny and other petty crimes	8. Removal of Weapons Violators: School Buses

9. NBC "hotspots"			10. Investigation and reporting of drug and alcohol offenses	9. Awareness Training: Bus Safety and Security
10. Initiating contact and negotiations with an individual threatening to commit a nuclear, biological or chemical attack			11. Copycat Events: Other Crimes on Campus	10. Copycat Events: Bus Safety and Security
11. Searches for toxic materials				
12. NBC lockdowns and evacuations				
13. Availability and administration of appropriate prophylaxis				
14. NBC chain of command				
15. NBC "hotspots"				
16. Initiating contact and negotiations with an individual threatening to commit a nuclear, biological or chemical attack				

Table 3: Specific Areas of Concern

ARGONNE NATIONAL LABORATORY

The next step in the process was to build an easy to use software system that could be easily and inexpensively deployed at schools K-12 and colleges and universities. To complete this task we worked with experts at Argonne National Laboratory (ANL). The categories, core areas and specific areas of school safety concern were translated to a modified Delphi questionnaire using an ipsitive "yes" or "no" format and given to ANL. Each question set on the modified Delphi survey questionnaire is accompanied with one or more control questions that are used to detect conflicts with other responses and to assure that the responder fully understands what they are being asked. ANL was also provided with a set of algorithms and the quantitative weighted value of each question in deterring, detecting, communicating, delaying, preventing and when necessary the timing and effectiveness of responses and the mitigation for each question.

Based on our collaboration with ANL, we have produced an easy to use software package that can be installed at very low cost at virtually any school that has an internet connection in the world. The system is simple and easy to use by school administrators and teachers alike. A traffic light approach is used to advise users of their performance. A "red" means that the school is not meeting minimum

performance levels. A yellow means that the school has met minimum performance levels but improvement is required. A green means that a school is operating at a level above minimum performance. Whenever performance is not at the green level the school is provided with the exact steps it needs to take to achieve the safest levels of overall operation.

SCHOOL AND CAMPUSTQ USES BIG DATA

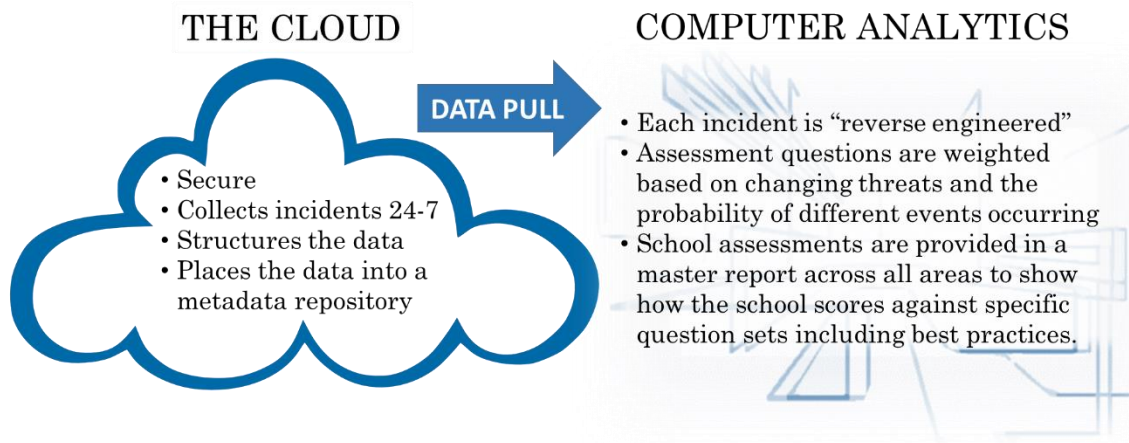


Figure 1: School and CampustQ uses the Cloud and Computer Analytics

School and CampustQ is a highly scalable cloud-based system that collects incident information 24-7 from the World Wide Web across each of the ten major categories of school safety concern and structures the data in a way that each incident can be “reverse engineered” for lessons learned. The same data is used to weight the deterrence, detection, prevention, response and mitigation of each question set in the School and CampustQ assessment software. School assessments are provided in a master report to show how the school scores against the specific question sets including best risk management practices.

A PUBLIC PRIVATE PARTNERSHIP

To deploy School and CampustQ we are seeking charitable donations from American businesses and private citizens that will enable the NSSC to deploy School and CampustQ in the State of Maryland and across the nation. Our goal is to provide the software and its maintenance at little or no cost to schools.

FUTURE DEVELOPMENT OF THE SCHOOL AND CAMPUSTQ SOFTWARE

Public and private contributions to ICM will be used to further develop our database of actual school incidents and reverse-engineer them to look for lessons learned and to keep abreast of changes in the risk environment. We will also use contributions to build a series of other simple and easy to use software tools that can be used to develop school safety plans, virtually and actually train and test their implementation and to guide best responses to incidents involving schools.