PATENT INFRINGEMENT ANALYSIS

BACKGROUND

1. In 2003/2007 FQTQ filed invention disclosures; in July 2007 a USPTO patent issued on these invention disclosures. The inventions were the forerunner of what is called "predictive analytics" today.
2. The inventions were the result of a program of research conducted by the inventor from 2002 through 2006 at the George Washington University on complex adaptive systems. This research specifically included the protection of the food supply.
3. FQTQ shared their patented ideas and trade secrets with the U.S. Government under Title 18 USC § 1905 which provides protection from U.S. Government misappropriation of trade secrets.
4. The FDA via their contractor Battelle Memorial Institute and the Department of Defense (DOD) violated Title 18 USC § 1905 and misappropriated FQTQ's patented ideas and trade secrets. They proceeded to let a "pass through directed" subcontract to Valbrae Technologies to duplicate FQTQ products.
5. FDA posted the duplicate products at their website for free use by the food industry.
6. The above actions resulted in the broad diffusion of FQTQ's patented ideas and trade secrets across the food industry.
7. FQTQ issued 13 information memoranda over the period May 2013 to March 2015 to 754 food companies advising them that any use of the duplicated FDA tools represented patent infringement and the unauthorized use of stolen FQTQ trade secrets.
8. On April 12, 2015, FQTQ attended the Grocery Manufacturer's Association (GMA) Science Forum. GMA and their member companies are infringing on the FQTQ patent and using FQTQ trade secrets in collaboration with Battelle Memorial Institute.

IMPORTANT DEFINITIONS FOR UNDERSTANDING THE PATENT

1. A complex adaptive system is any complicated system that operates by a defined set of fundamental rules that are, in turn, affected by initial conditions.
2. Fundamental rules are the least common denominators of a complex adaptive system that are affected by different combinations of initial conditions. This is a scientific oversimplification, but one way you can think about fundamental rules is similar to an independent variable.
3. Initial conditions are those things that affect how the fundamental rules of a complex adaptive system will behave. This is a scientific oversimplification, but one way you can think about initial conditions is similar to dependent variables.

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ANALYSIS OF CLAIM 1.

CLAIM 1.		EXPLANATION
A method of assessing and managing behavior of a complex adaptive system, comprising the steps of:		This includes all critical infrastructure systems which are by definition complex and adaptive
STEP NO.	A METHOD CONSISTING OF FIVE STEPS	
1.	…inputting a first plurality of data defining parameters of said complex adaptive system;	a. Continuously harvest data about a specified system from the World Wide Web and other open sources.
		b. Filter, categorize and structure the data by event type.
2.	…defining a plurality of fundamental events which determine behavior of said complex adaptive system;	a. Stratify, i.e., cluster, events by type.
		b. Define the fundamental rules, i.e., least common denominators of different types of events.
3.	…modifying at each of a plurality of times at least one of said first plurality of data to define a plurality of initial conditions;	a. Define a starting population (ñ) of initial conditions, i.e., things that affect how the fundamental rules, i.e., common denominators, of the system behave.
4.	…testing each of said first plurality of data to determine a first subset of said first plurality of data which are most relevant to said plurality of fundamental events for each of said plurality of initial conditions in order to develop a plurality of scenarios of behavior of said complex adaptive system, and;	a. Add and subtract initial conditions in different combinations to test the effect of initial conditions on the fundamental rules, i.e., least common denominators, of system operation.
		b. Catalogue scenarios of different system behaviors given the specific combination of fundamental rules and initial conditions at t_1, t_2, t_3….
5.	…measuring an effect of each one of said plurality of initial conditions of each respective one of said developed plurality of scenarios on said first subset of data to provide status information which is capable of being tested to indicate likelihood of an event occurring in said complex adaptive system.	a. Quantify the degree to which different combinations of initial conditions affect the fundament rules of system operation to produce desired/undesired system behaviors and outcomes.
		b. Statistically project system behaviors and outcomes based on Monte Carlo comparison and contrast with real world operating systems to produce a likelihood calculation of a desired/undesired event occurring.

TABLE 1: ANALYSIS OF CLAIM 1

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TEN (10) PROCESS STEPS TO IMPLEMENT CLAIM 1

STEP NO.	DESCRIPTION	CLAIM NO.
1.	Identify a selected system, i.e., a complex adaptive system;	1.
2.	Harvest events regarding the complex adaptive system;	1. a.
3.	Structure the data;	1. b.
4.	Stratify events by type, i.e., clustering;	2.a.
5.	Define the fundamental rules of system operation for clustered events;	2.b.
6.	Determine a starting population (ñ) of initial conditions affecting the fundamental rules;	3.
7.	Test the data by adding or subtracting different combinations of initial conditions to produce different system behaviors;	4.a.
8.	Catalogue multiple scenarios of different system behaviors produced by the addition and subtraction of initial conditions;	4. b.
9.	Quantify the degree to which different combinations of initial conditions affect the fundament rules of system operation	5. a.
10.	Statistically project system behaviors and outcomes based on comparison and contrast with real world operating systems to produce a likelihood calculation of a desired/undesired event occurring.	5. b.

TABLE 2: TEN PROCESS STEPS

FOOD FRAUD AS A REAL WORLD EXAMPLE

STEP NO.	DESCRIPTION	CLAIM NO.
1.	Food fraud is by definition a complex adaptive system;	1.
2.	Harvest food fraud events from all open sources;	1.a.
3.	Structure the data by location, date, event description, food type, event sequence, motivation, etc., etc.	1.b.
4.	Stratify different types of food fraud events by type, i.e., clustering;	2.a.
5.	Define the fundamental rules of food fraud for the different clusters of food fraud events;	2.b.
6.	Determine a starting population (ñ) of initial conditions affecting the fundamental rules for each cluster of food fraud events;	3.
7.	Test the data by adding or subtracting different combinations of initial conditions affecting food fraud to produce different outcomes;	4.a.
8.	Catalogue multiple scenarios of different food fraud outcomes produced by the addition and subtraction of initial conditions;	4.b.
9.	Quantify the degree to which different combinations of initial conditions affect the occurrence of food fraud, and;	5.a.
10.	Statistically project the probability of a type of food fraud event occurring and the vulnerability of a given system to food fraud.	5.b.

TABLE 3: FOOD FRAUD AS A REAL WORLD EXAMPLE

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FQTQ Trade Secrets Revealed by FDA and Diffused Throughout the Food Industry

FQTQ created a large body of trade secrets as they reduced their patent to practice. A trade secret is defined as a formula, practice, process, design, instrument, pattern, commercial method, or compilation of information which is not generally known or reasonably ascertainable by others, and by which a business can obtain an economic advantage over competitors or customers.

The misappropriation and unauthorized use of trade secret information is the key indicator of patent infringement because trade secrets are tied directly to patent claims by reduction to practice.

FQTQ maintained a large body of trade secrets as proprietary information until 2012 when the company discovered that the FDA was publishing and broadly diffusing trade secrets across the food industry. Over the period May 2013 to March 2015 FQTQ issued 13 information memoranda to 754 food companies advising them that any use of the duplicated FDA tools represented patent infringement and the unauthorized use of stolen FQTQ trade secrets. The FQTQ misappropriated trade secret information was also protected as FQTQ copyrighted information. A partial listing of former FQTQ proprietary trade secrets as they relate only to Claim 1 of the patent is set forth in Table 3, below. Other trade secrets developed as FQTQ reduced Claims 2-20 of the patent to practice are not included in this document.

FQTQ Trade Secrets Revealed by FDA and Diffused Throughout the Food Industry				
No.	Former FQTQ Trade Secret	Exactly What was Compromised	Novelty of the Trade Secret	Claim No.
1.	Novel means, methods and techniques for conducting threat continuum analyses.	FQTQ elements of prevention, the FDA uses the substitute term of "Intervention"; communication and response.	Application of systems approach to food safety and food defense.	1.b.
2.	Novel means, methods and techniques for identifying indicators and warnings of impending food events.	FQTQ means, methods and techniques for determining indicators and warnings, the FDA uses the substitute term "signals".	The use of systematic "reverse engineering" of food events to determine the warning signs of impending events.	4. a. & b.; 5. b
3.	Probability of occurrence as a function of target vulnerability and consequence.	FQTQ method of determining probability of occurrence.	Core algorithm used for calculation of probability of occurrence.	5.b.

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4.	Novel means, methods and techniques for determining food protection risks and the specific measures that must be implemented to mitigate risks and identify interventions.	FQTQ means, methods and techniques for identifying risk mitigation, the FDA uses the substitute term "risk mitigation strategies".	First application of systematic method for developing food safety and defense countermeasures.	5. a. & b.
5.	Novel means, methods and techniques for creating and conducting simulations.	FQTQ means, methods and techniques for simulating events.	Integration of quantified real world event data as part of simulations of possible future events.	1.a.; 4. a. & b.; 5. a. & b.
6.	Novel, means, methods and techniques for identifying and prioritizing high risk areas at food operations and along the supply chain based on probability of occurrence.	FQTQ means, methods and techniques for prioritizing risk.	Systematic method to quantify risk based on probability of occurrence.	4.a & b.; 5. a. & b.
7.	Novel, means, methods and techniques for "reverse engineering" of past and simulated events.	FQTQ means, methods and techniques for structuring event data.	The use of event sequence and threat continuum analysis as a systems approach to food defense and safety.	1. b.; 2. a.
8.	Novel, means, methods and techniques for the identification of high risk agents.	FQTQ means, methods and techniques for gathering, deconstructing and analyzing, as complex adaptive systems, food incidents and related data to identify high risk agents.		All claims 1. - 5.
9.	Novel, means, methods and techniques for the identification, gathering and analysis of data to produce actionable knowledge for risk mitigation.	FQTQ means, methods and techniques for identifying the types of data that should be collected and subjected to analysis in order to identify actionable intelligence to prevent food safety and food defense events.		
10.	Novel, means, methods and techniques for risk reduction based on the "reverse engineering" of past food events, use of futures driven scenarios and the application of advanced science and information technology.	Methods used to identify risks and their associated risk reduction measures; the FDA substitutes the term "mitigation strategies" for risk countermeasures.	Reverse engineering of events; harvesting and analysis of real world event data; clustering of events by type; futures driven scenarios and the use of computer analytics to project desired/undesired outcomes.	

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11.	Novel systems risk model that subsumes food operations, food defense and food safety, i.e., the food safeguards triad.	Food systems risk model.	An all hazards approach to food protection including all aspects of operations, security and safety.	1. b.
12.	Novel, means, methods and techniques for continuous performance assessment through perpetual assessment and inspection.	Methods for tying continuous operational performance with perpetual assessment and inspection; the FDA uses the substitute term "inspectional strategies."	Assessment and inspection based on continuous analysis of changes in the risk environment.	1.a.; 5.b.
13.	Novel, means, methods and techniques for targeting the use of resources to obtain the greatest risk reduction value at the most reasonable cost.	Methods to determine performance and best investments to mitigate risk; the FDA substitutes the term "mitigating strategies" for "best investments."	Prioritization of performance criteria based on quantitatively deduced risk reduction value.	4.a & b.; 5.a & b.
14.	Novel, means, methods and techniques for integrally tying the use of specific information technology applications to food industry operational requirements.	Methods for integrally tying information technology to create operational risk management tools that include assessment, prevention and response.	Computer data interfaces; analytic treatments of data; organization (ontologies and taxonomies), presentation and visualization of data; system architectures.	1.a & b.; 2.a. & b.; 3.a; 4.a & b.; 5.a.
15.	Novel food protection systems model and the means, methods and techniques for treating food protection as a science that relies on quantitative statistical methods for determining risk values.	The systems model and means, methods and techniques for the quantitative valuation of risk values.	Integration of Likert scales to provide baseline risk values whose fidelity increases as the population (ñ) of events increases; reverse engineering of real world events to quantify risk values using a systems model; application of computer analytics.	All claims 1. - 5.
16.	Novel, means, methods and techniques for combining modeling, science-based, i.e.,	Methods for creating databases; combining models, quantitative analysis and computers	Harvesting actual events; structuring the data; creating event clusters; reverse engineering of	

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	quantitative, analysis and advanced information technology to produce operational food protection software applications for the food industry.	for the production of food protection software.	events; creation of causal event sequences; creation of event scenarios; Monte Carlo analysis of event scenarios; computer data interfaces; analytic treatments of data; organization (ontologies and taxonomies), presentation and visualization of data; system architectures.	
17.	Novel, means, methods and techniques for identifying and scientifically characterizing the critical nodes of complex adaptive systems; critical node are defined as the most sensitive parts of a complex food system that are most sensitive to changes in their environments and the means, methods and techniques used to identify them.	The means, methods and techniques for identifying and characterizing critical nodes.	Harvest the data; structure the data; stratify (cluster) the data by event type; define fundamental rules; create starting population of initial conditions; test the data to produce different outcomes; catalogue scenarios; quantify the degree to which different combinations of initial conditions affect the occurrence of food incidents; Statistically project the probability of a type of food fraud event occurring and the vulnerability of a given system to food fraud.	All claims 1. - 5.
18.	Novel, means, methods and techniques for determining best response alternatives for food events.	Methods for determining best response alternatives for responses to food emergencies.	Stratify like events; reverse engineer the events; use contrast and comparison with actual events to determine what works and what does not work; develop response templates that reflect best lessons learned and projected future events.	2.b.; 3.a.; 4.a.& b.; 5.a. &b.

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19.	Novel, means, methods and techniques for developing operational software tools.	Methods for developing operational food safety, food defense and food fraud software tools.	Continuous harvesting and analysis of food events including environmental events; real time reporting; for food defense and food fraud; application of forensic analysis; applies projective analytics and modeling to produce quantitative risk values.	All claims 1. - 5.
20.	Novel, means, methods and techniques for preventing events.		Stratify like events; reverse engineer the events; use contrast and comparison with actual events to determine what works and what does not work; identify preventive measures.	2.b.; 3.a.; 4.a.& b.; 5.a. &b.
21.	Novel, means, methods and techniques for identifying and scientifically characterizing fundamental rules and initial conditions of food systems and scientifically quantifying results.	Methods for relating independent and independent variables affecting all aspects of food protection including economic product values such as volume, scarcity; ease, testing, governance, inherent properties of commodities, cultural, historic, sourcing and origins of product.	Country of origin intelligence including current and anticipated production, growing conditions, past and anticipated harvest, exports and imports by commodity type, price, levels of in-country corruption, child labor, human and drug trafficking and many other variables.	2.b.; 3.a.; 4.a & b.; 5.a & b.
22.	Novel, means, methods and techniques for trends analysis and scientifically projecting (based on statistical methods) the likelihood of occurrence.	Specific methods of trend analysis that rely on statistical projection of events based on initial conditions and their affect on fundamental rules of food system behavior.		
23.	Novel, means, methods and techniques for enhancing the transparency of the food supply system from commodity origination through consumption.	Methods for enhancing the transparency of the food supply system.	Use of real time data; quantification of food defense, safety and food fraud criteria; statistical development of high risk locations by commodity type; chain of custody	1.a; 2.a.; 4.b.; 5a. & b.

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			certifications, violators list.	
24.	Novel, means, methods and techniques for generating near real time quantitative risk values to drive risk management software.	Methods for creating dynamic risk management software.	Harvest the data; structure the data; stratify (cluster) the data by event type; define fundamental rules; create starting population of initial conditions; test the data to produce different outcomes; catalogue scenarios; quantify the degree to which different combinations of initial conditions affect the occurrence of food incidents; Statistically project the probability of a type of food fraud event occurring and the vulnerability of a given system to food fraud.	All claims 1. - 5.
25.	Novel, means, methods and techniques for the use of frequency (ω); relational attractions and the threat continuum for the weighting of risk.	Methods for weighting frequency and relational attractions among fundamental rules and the initial conditions of food supply systems.	Core algorithms; threat continuum analysis; use of Likert scales to produce baseline risk values whose fidelity increases as the population (ñ) of analyzed events increases; application of analytics in near real time, etc.	1.b; 2.b; 3.a.; 4a. & b.; 5.a & b.
26.	Novel, means, methods and techniques for bridging the gap between qualitative social process and quantitative scientific reality.	Means, methods and techniques for bridging the gap between qualitative social process and quantitative scientific reality	Decision path analysis-integration of quantified real world event data as part of simulations of possible future events; "reverse engineering" of food events to determine the warning signs of impending events	All claims 1. - 5.

TABLE 4: FQTQ TRADE SECRETS REVEALED BY FDA AND DIFFUSED THROUGHOUT THE FOOD INDUSTRY

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FQTQ INTELLECTUAL PROPERTY MISAPPROPRIATED BY GMA MEMBERS AND CONSULTANTS

FQTQ PATENTED IDEA	FORMER FQTQ TRADE SECRETS	MISAPPROPRIATED BY GMA AND THEIR MEMBERS	
		YES	NO
CLAIM 1: Food fraud is by definition a complex adaptive system; harvest food fraud events from all open sources; structure the data by location, date, event description, food type, event sequence, motivation, etc., etc…	1; 5; 7; 8; 9; 10; 11; 12; 14; 15; 16; 17; 19; 23; 26; 25, and; 26	X	
CLAIM 2: Stratify different types of food fraud events by type, i.e., clustering; define the fundamental rules of food fraud for the different clusters of food fraud events…	7; 8; 9; 10; 14; 15; 16; 17; 18; 19; 20; 21; 22; 23; 24; 25, and; 26	X	
CLAIM 3: Determine a starting population (ñ) of initial conditions affecting the fundamental rules for each cluster of food fraud events…	8; 9; 10; 14; 15; 16; 17; 18; 19; 20; 21; 22; 24; 25, and; 26	X	
CLAIM 4: Test the data by adding or subtracting different combinations of initial conditions affecting food fraud to produce different outcomes; catalogue multiple scenarios of different food fraud outcomes produced by the addition and subtraction of initial conditions…	2; 5; 6; 8; 9; 10; 13; 14; 15; 16; 17; 18; 19; 20; 21; 22; 23; 24; 25, and 26	X	
CLAIM 5: Quantify the degree to which different combinations of initial conditions affect the occurrence of food fraud; statistically project the probability of a type of food fraud event occurring and the vulnerability of a given system to food fraud…	2; 3; 4; 5; 6; 8; 9; 10; 12; 13; 14; 15; 16; 17; 18; 19; 20; 21; 22; 23; 24; 25, and; 26	X	

TABLE 5: FQTQ INTELLECTUAL PROPERTY MISAPPROPRIATED BY GMA MEMBERS AND CONSULTANTS

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Hnatio, J.H. (2007) USPTO issued patent based on copyrighted doctoral dissertation.	http://www.google.com/patents/US8103601
Hnatio, J.H. (2012) "Managing food defense risk," (monograph), Frederick MD: FoodQuestTQ Press.	http://jgpis.org/foodquesttq-copyrighted-documents-used-without-permission-and-attribution/
Hnatio, J.H. (2012) "Making sense of food defense," (article), Frederick MD: National Food Safety Collaboratory.	
Hnatio, J.H. (2012) "Become a chess master," (article), Frederick MD: National Food Safety Collaboratory.	
Hnatio, J.H. (2013) "Horsegate: Preventing Food Fraud in Europe," (monograph), Frederick MD: FoodQuestTQ Press.	http://www.nfpcportal.com/Portals/1/papers/HORSEGATE.pdf
Hnatio, J.H. (2013) "2012 report card for food protection: Is performance meeting expectations?" (monograph), Frederick MD: FoodQuestTQ Press.	http://jgpis.org/foodquesttq-copyrighted-documents-used-without-permission-and-attribution/
Hnatio, J.H. (2013) Course for NATO conference on food protection (course syllabus and content), Frederick MD: FoodQuestTQ Press.	
Hnatio, J.H. (2014) "The food fraud Kabuki dance" (article), Food Quality Magazine.	https://www.joomag.com/magazine/food-quality-magazine-october-2014/0531436001414486039?page=16
Hnatio, J.H. (2014) "Fighting food fraud: A primer for the European food industry," (book), Frederick MD: FoodQuestTQ Press.	http://www.gmaonline.org/forms/store/ProductFormPublic/search?action=1&Product_productNumber=P20
Hnatio, J.H. (2014) "Food fraud and the criminal enterprise," (article), Frederick MD: National Food Safety Collaboratory.	http://www.nfpcportal.com/MemberResources/Blog/tabid/176/Article/4504/food-fraud-and-the-criminal-enterprise.aspx

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