SAINT Voice

Increase Situation Awareness

Reduce Distraction

Limit Liability

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The Laptop Liability

No one working with Law Enforcement needs to be told about the dangers of texting and driving. The statistics are well known:

- People reading and sending text messages are 23 times more likely to be involved in an accident.[1]
- 18% of injury crashes in 2010 were reported as distraction-affected crashes.
- Sending or receiving a text takes a driver's eyes from the road for a length of time equivalent to driving the length of an entire football field while blindfolded. [2]
- Etc.

We all know the risks. So the question is:

Why is Law Enforcement texting and driving every day?

Every shift of every day there are hundreds of messages sent to and from the MDT (Mobile Data Terminal) inside of moving police cars. Although the department may tell their officers not to read or type on the laptop while the police cruiser is moving, the reality is that it is unrealistic to expect them to pull over to the side of the road before reading their inbound messages.

Being in a law enforcement vehicle does not grant the Police Officers on our roads some sort of immunity. Sure most officers are highly trained, and have logged miles of patrol experience, but eventually the laws of physics will catch up with them.

The high volume of text messaging to and from the police cars turns an accident into a statistic probability. It is not a question of *if* a Law Enforcement Agency will have an accident due to driver distraction, but *when*. And when it happens, what will protect the city, county or state from liability?

In the past few years, the ground around the police agencies has been chipped away to the point they are standing virtually alone against the legal firestorm that is approaching:

- 34 States now have anti texting and driving laws[3]
- On September 30, 2009, President Obama issued an executive order prohibiting federal[4] employees from texting while driving on government business or with government equipment.

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[1] Virginia Tech Transportation Institute (http://www.vtti.vt.edu)
[2] http://www.distraction.gov/research/PDF-Files/Driver-Distraction-Commercial-Vehicle-Operations.pdf
[3] http://www.ghsa.org/html/stateinfo/laws/cellphone_laws.html
[4] http://www.cdc.gov/motorvehiclesafety/distracted_driving/

- On October 27, 2010, the Federal Motor Carrier Safety Administration enacted a ban that prohibits commercial vehicle drivers from texting while driving[5]

What should a Law Enforcement Agency expect will happen if their officer is involved in an accident and it is discovered that MDT distraction was the cause?

If they are expecting juries and lawyers to go easy on them because they were just doing their jobs, they are being incredibly naive. Judgments being awarded for texting while driving cases are reaching all time highs:

- In Southern California, a woman with minor soft tissue injuries was awarded $176,000 judgment (which was over ten times what the insurance policy covered.)[6]
- In Chattanooga, TN the victim of a texting while driving accident was recently awarded $3 million.[7]
- A jury in Texas awarded a victim $21 Million in a distracted driving case.[8]

The bottom line of all of this is:

Police need a better way to use their MDTs - one that will make accidents less likely, and protect the law enforcement agency from liability.

This is what **SAINT Voice** is designed to do.

SAINT Voice - Awareness Without Distraction

SAINT Voice was designed to work with *any* existing MDT's mobile software, such as those provided by Intergraph, Motorola, and Northrop Grumman, etc.

SAINT Voice connects to the mobile software and provides two critical features:

- Voice Assist
- Voice Command

Voice Assist

SAINT Voice Assist monitors all inbound messages coming into the MDT, and reads critical information to the officer, which allows them to keep their eyes on the road.

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[5] Ibid
[6] http://www.mainslaw.com/verdicts-settlements/
[7] http://www.chattanoogan.com/2012/9/12/234167/Stop-The-Texting-While-Driving.aspx
[8] http://www.distracteddrivinghelp.com/news/coca-cola-hit-21-million-distracted-driving-lawsuit

It is important to note that SAINT Voice does not simply mindlessly read back *all* of the information that is contained in the message -- it intelligently processes the message based on rules defined by the agency. This process is shown in Figure 1.

Figure 1
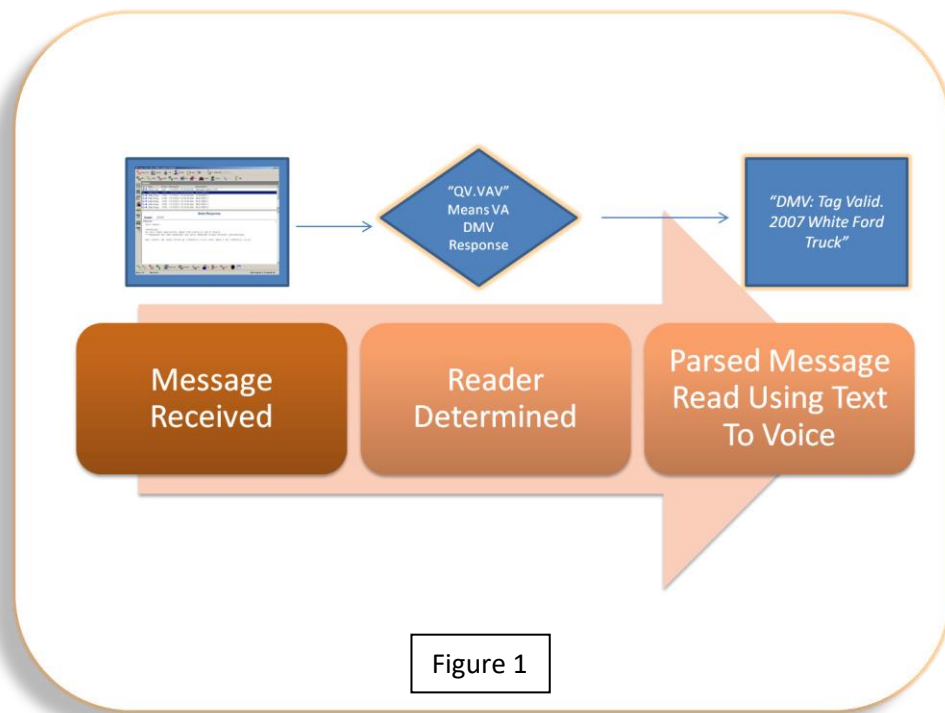
To accomplish this, SAINT Voice goes through two cycles: Recognize and React. In the recognition cycle, SAINT reads through the data from the inbound message, and determines its source. If the source is undefined, it will do nothing. If, however, it determines that the source is one that has been flagged for interest, it passes the message off to the specified Reader. The Reader tells SAINT what part of the message is of interest based on the Law Enforcement Agency's policy.

The Readers are an important feature of SAINT Voice, because it allows for customization and maintainability. The importance of this is shown in the examples displayed in Figures 2 and 3.

Figure 2 shows a sample format returned by the Pennsylvania Department of Motor Vehicles.

```
               PENNSYLVANIA DEPARTMENT OF MOTOR VEHICLES

  NAM/FINLEY,CHUCK M                    DOB/1966-06-13     SOC/123-45-6789

  9999 WINDMILL RD                      SEX/MALE           HGT/511   WGT/
  ALLANWOOD, PA 30294                   HAI/               EYE/BROWN

  OLN/A12345789      OLS/PA

  STATUS: SUSPENDED
  ISSUED: 2012-07-22 CLASS: SINGLE VEH  26,000 EXPIRES: 2015-06-14
  COMMERCIAL CLASS:                     COMERICAL STATUS:

  ***THIS INFORMATION IS PROVIDED FOR LAW ENFORCEMENT PURPOSES ONLY***
  MRI 400433 IN: NLI1 23980 AT 30MAY2013 18:53 OUT: SM02 70 AT 30MAY2013 18:53
```

Figure 2

Someone who regularly works with Pennsylvania Driver's Licenses (shown in Figure 2 on the previous page) would be able to find the information they need rather quickly.

But what about a Law Enforcement Officer from Texas, who is used to seeing transmissions that look like the one in Figure 3?

```
                    TEXAS DEPARTMENT OF MOTOR VEHICLES


          NAME: FINLEY, CHUCK, MILNER
   DESCRIPTION: WHITE\MALE\06131966\5-11\140\BROWN\ BROWN
       SEX OFF:   COMM IMPED:   ORGAN DONOR:   VISA EXP:
 PHYSICAL ADD: 9999 WINDMILL RD
 CI/CO/ST/ZIP: ALLANWOOD,TARRANT,TEXAS,78602-0000, UNITED STATES
  MAILING ADD: P O BOX 99999
    CI/ST/ZIP: LONGVIEW,TEXAS, 78602-0000, UNITED STATES
   REC STATUS: ELIGIBLE
 ADMIN STATUS:
  CARD STATUS:
 HME THR ASMT:                      EXP:
    CARD TYPE: DL #: A12345789 CLASS: AM  TYPE: CDL  EXPIR DATE: 11192012
 RESTRICTIONS: A WITH CORRECTIVE LENSES
 ENDORSEMENTS: N TANK VEHICLE
               H HAZARDOUS MATERIALS


 **** DRIVER RECORD INFORMATION IS PERSONAL INFORMATION PROTECTED UNDER THE
 FEDERAL DRIVER PRIVACY ACT OF 1994 (18 USC 2721, ET SEQ.) AS AMENDED AND THE
 MOTOR VEHICLE RECORDS DISCLOSURE ACT, TEXAS TRANSPORTATION CODE 730 *******
```

Figure 3

Finding the information becomes geometrically harder when considering all of the different states formats, and the difficulty grows to dangerous proportions if the officer attempts it while driving.

But this is all handled by SAINT Voice's Reader system which allows for accurate readings to be done for any state, as well as for dispatch messages, BOLOs, and the like.

In the above examples, SAINT would sound an alarm, and then read out loud to the officer: **"License Status -- Suspended. Fifty-two year old male."** (*Note: The alarm sounds because of the suspended status. This is the default reading pattern for this report. To see how to modify that behavior, see Page 9,* Voice*Smith.*)

Voice Command

Voice Command is the other side of the solution. Whereas SAINT Voice reads inbound messages out loud to the officer, SAINT's Voice Command allows the Officer to command the MDT to perform tasks with simple English phrases.

Of course, we are well aware of the noise that is inside of every police cruiser. Because of this, we have developed technology that works with state of the art noise cancellation algorithms to enhance the clarity of the voice commands.
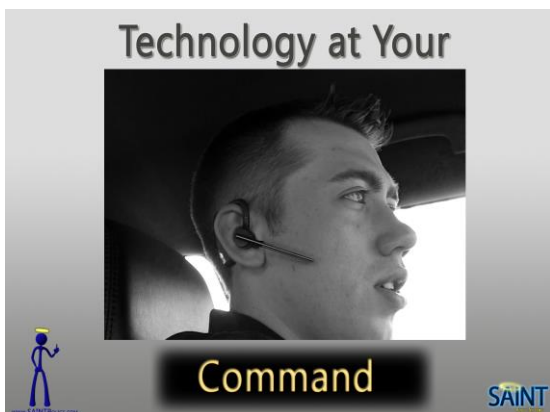
The headset we have implemented will not only connect to the MDT, and allow commands to be given; it also will connect via Bluetooth to the officer's cell phone -- which means that it provides the added bonus of reducing distraction in case the officer has to take a phone call as well.

Virtually anything that can be done through the keyboard can be commanded through the headset. It is possible to change statues (i.e. Arrive, On Scene, Clear, etc), call for reports (i.e. Unit summary report to view all activity for a group or region) or even execute NCIC searches (i.e. execute a license tag search, or an OLN search during a traffic stop).

With the combination of Voice Assist and Voice Commands, the officer in the field rarely needs to look at, or touch, the MDT -- which means they can keep their focus on other things.

SAINT Voice - Under The Covers

The best way to see SAINT Voice work is by setting up an in-house demonstration. We regularly set up pilots so it can be tested on existing equipment, and running with existing software.

But, curiosity usually means that people wonder how it does what it does and because of this, we will try to explain it here.

There are two main portions to the Voice Assist solution: *Message Monitoring*, and the *Accessibility Framework*.

Message Monitoring - is what allows us to keep a lookout for inbound messages that come into the MDT. There are several ways we can do this. If we have a partnership with the mobile software vendor, such as Intergraph, no extra setup is needed. We are able to directly monitor the inbox of Intergraph's iMobile© or MPS© (Mobile Public Safety).

In the case of most other software, it is possible to turn on logging inside the MDT's mobile software. This allows us to easily check for things that are inbound to the MDT, and respond to them in real time.

If neither of these ways are an option, there are other methods we can use -- although so far we have never had to employ these -- most mobile software has a logging system that can be turned on (they use it to verify that the transmission to the Dispatch Center is working correctly).

Realizing that an inbound message has hit the MDT, though, is only half of the battle. We also need to recognize what kind of message was received. To accomplish this, we employ a business rules system we refer to as our "Reader Files".

SAINT Voice ships with reader files that correspond to every type of inbound message in which a Law Enforcement Agency is interested... including such things as DMV replies, NCIC Reports, BOLOs, and Dispatches. This is what enables SAINT Voice to read through the inbound message and know what information is of interest to the officer in the car.

The beauty of the SAINT Voice system, and what sets it leagues ahead of any other product on the market, is that these reader files are easily changed.

SAINT Voice includes a forms-based authoring package we call Voice*SMITH*. With very little training, anyone can learn how to make changes to the Reader files, and change the way the messages are read. This is discussed more under the Voice*SMITH* section of this paper.

Accessibility Framework - is what allows SAINT to connect to any Windows or web based program. This is critical to the success of SAINT Voice because it allows SAINT to view a running program the same as the officer in the car views it.

SAINT Voice can read the screens, push the buttons, fill out fields, and navigate through the screens just like a human can. It is this ability to read, react, and drive the application that sets SAINT apart.

SAINT's *Accessibility Framework* executes events on the user's behalf -- such as a keystroke or a mouse click -- by generating the same User Events that the officer would generate using the mouse and keyboard.

To the program, SAINT's actions are completely indistinguishable from what a human does. And, because of SAINT's ability to read the screens of the application, it checks the result of each action -- just like a human would. It never just sends the key and hopes it lands.

It is when both of these are combined that we see the power SAINT can provide by chaining actions together.

The flow chart shown in Figure 4 illustrates this.

Figure 4
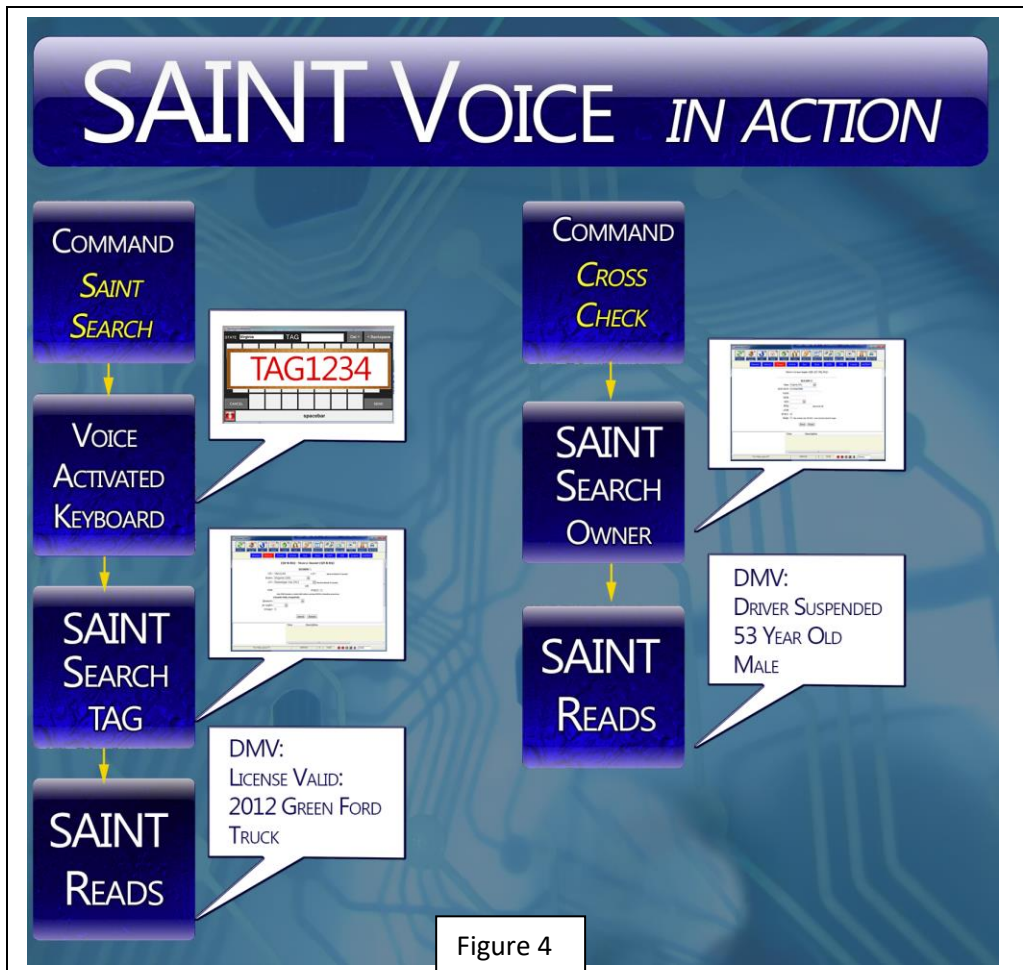
1. The officer activates a command by saying: "SAINT Search"
2. This brings up the Voice Activated Keyboard. This onscreen Keyboard allows the officer to dictate the license plate tag, and gives audible and visual feedback to confirm the search parameters.
3. Following the "Go" command, SAINT executes the Tag search. In this case, which is Intergraph's iMobile, this means that SAINT goes to the NCIC search screen, chooses the VEHICLE Sub Menu, enters the License Plate Number, and executes iMobile's Search. iMobile takes over from here, sending the information to the search switch and requesting the information from NCIC and the DMV.
4. As the information begins flowing back in, SAINT reacts and reads the significant portions of the records out loud.
5. When the Vehicle Information has completed, the officer gives SAINT a new command: "SAINT Cross Check." This command informs SAINT that the officer wishes to also run the owner's license information. SAINT pulls the owner's OLN off of the DMV record, and goes back to the NCIC search screen -- this time selecting the DRIVER Sub Menu. SAINT will enter the OLN information, and execute iMobile's Search. Again, the iMobile program executing the Driver OLN search in NCIC and the DMV.

6. Once more, as the information begins flowing back in, SAINT reacts and reads the significant portions of the records out loud.

There are several important things to note in this sequence which bear emphasizing:

- The officer never touches the laptop's keyboard.
- The officer is not required to take his eyes from the road at all to use the system.
- The existing systems are used to execute the search, so the same credentials and logging systems are in place.

## Voice*SMITH* - Keeping SAINT Voice Accurate

Because SAINT Voice uses a specialized Text-To-Speech solution, SAINT can say *anything* the Law Enforcement Agency wants it to. But, just as importantly, SAINT is designed to be dynamic. This is critical to the viability of Voice Assist over the long term for one obvious reason: Things Change.

Not only do individual states make changes to the reply format, but the Law Enforcement Agency may change their policies. This makes being able to quickly make changes critical, and is where SAINT's solution is second to none.

The Law Enforcement Officer can make a request for changing the reader, right from the laptop, while in the vehicle (as shown in Figure 5).

Figure 5
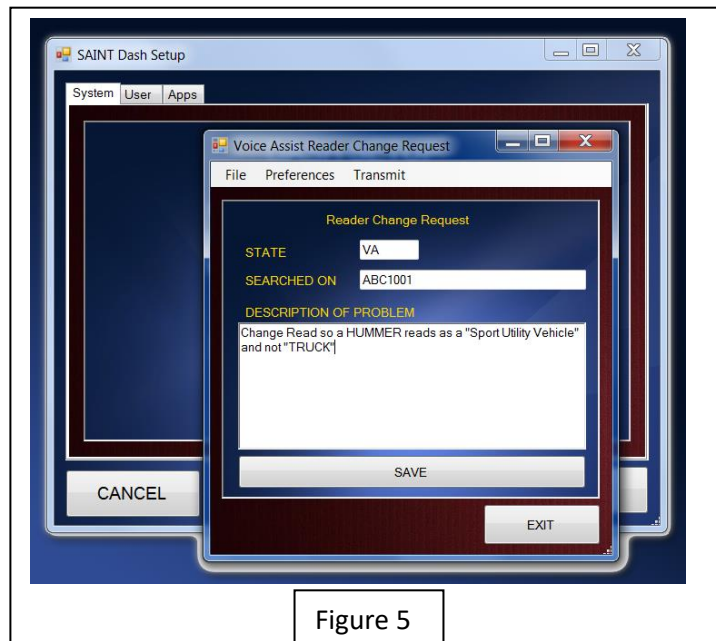
This request is sent as a secure request to the SAINT Administrator, who can then implement the change using the Voice*SMITH* authoring program. It is a simple forms-based system -- no programming is required.

Figure 5
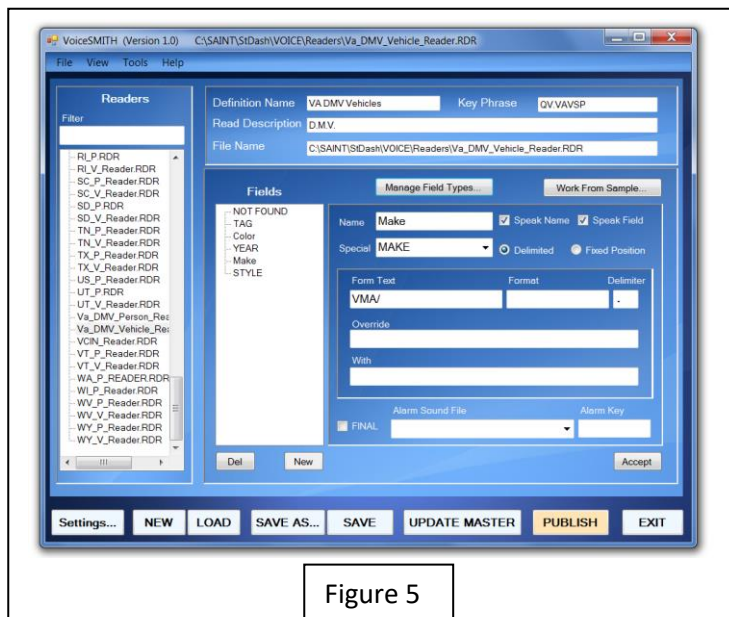
When the changes are finished, they are "published" to a secure FTP server (inside the Law Enforcement Agency's firewall.) They can be retrieved at any time from the police car, using SAINT's update feature. This is so updates can be done incrementally, without ever requiring a fleet recall. (*Note: This assumes that the Law Enforcement agency has allowed for FTP access within their firewall. SAINT cannot and will not violate Security Policies.*)

Conclusion

Because of the changing legal landscape, both local and state Law Enforcement Agencies are at risk. Their officers are using a laptop in a moving vehicle -- which is just as distracting as texting on a cell phone.

SAINT Voice is a unique solution designed to attack this problem head on. With SAINT Voice, the laptop responds to spoken commands and takes the appropriate action. The officer can run reports, change status, or even run NCIC searches, without ever having to touch or look at the computer. It responds to inbound messages, summarizes the data, and reads back key portions to the officer.

Because of its innovative design, SAINT Voice works for any police department regardless of the mobile software they are running. It increases productivity while decreasing distraction and limiting risk.

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