



## Optalert

- Optalert is a fatigue management technology to help people remain alert and attentive and perform their work safely.
- This technology was born of 14 years research, and launched 3 years ago.
- Optalert continually monitors the user's fitness for work and alerts them should their drowsiness, fatigue or inattention reach dangerous levels.
- Optalert is leading fatigue technology in the World, and has been independently validated and peer reviewed.



## Drivers and fatigue: some facts

- 71% of drivers are impaired by fatigue during their shift.
- 21% of drivers had at least one fatigue related incident on their last trip.
- 52% of major crash insurance claims per annum are fatigue related.
- Almost half of long distance truck drivers have nodded off whilst driving.
- In the surface mining industry alone, up to 65% of truck haulage accidents are directly related to operator fatigue

Sources:

Australian Department of Infrastructure, Transport, Regional Development and Local Government ([2001 survey of long distance heavy vehicle drivers](#)), and the National Transport Commission.

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- Optalert Glasses are worn like ordinary glasses or sunglasses.
- The frames contain emitters and receivers which monitor eye and eye lid movements by a process called infrared oculography.
- This information is digitized by a miniature computer in the arm of the glasses which then transmits the data to the processor contained in the Optalert Vehicle System.

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## Optalert and Fatigue Management

- Optalert enables a business to:
  - protect their people
  - improve risk management
  - comply with duty of care and meet chain of responsibility requirements.
- Assist in developing a fatigue management plan.
- The difficulty with fatigue is that there's no one-size-fits-all solution for effectively managing it.
- Each company, or industry, is going to find that their risks and pressures are different, and therefore require different management techniques.

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## The Challenge

- To create a new Customer offering.
- This offering must include a Customer “no-touch” process.
- Investigation revealed the need to make changes to;
  - Data collected by Optalert Systems
  - Data transfer methodology
  - Data aggregation and analysis
  - Data Reporting

The logo graphic features a dark blue circle on the left with numerous thin, light blue lines radiating outwards to the right, creating a lens flare or signal effect.

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## “No-Touch” Customer process

- In order to achieve this Optalert needed to alter our current system:
  - Hardware
  - Software
- Web-enabled system is required

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## Identify a System to fit Optalert requirements

- Review functionality of current “Optalert Reports” application
- Define the specifications we need/think we need
- Options based on the accrued information



## Data collected by Optalert Processor

- Standard (Event only)
  - The last 720 hours (30 days) of warnings and data items (Events) are recorded in XML.
  - Approximately 200Kb of data per 24 hours per vehicle
- Advanced (Eye Movement & Event)
  - The last 4-12 hours of raw eye movement information are recorded in a rolling buffer.
  - Sampling frequency 500 times per second
  - Approximately 2Mb per 1 hour of raw eye movement information



## Identified Needs

- A proven web-enabled DBMS
- A database “compatible” with XML multidimensional data input
- Integrated high quality reporting functionality
- Proven email scheduling functionality
- Ability to integrate with Statistical application
- Future:
  - Additional functionality to Optalert System creating new data to be stored, uploaded, and analysed
  - Ability to run embedded, real-time Business Intelligence



## Identified Needs

- Application capable of being developed rapidly on a simple, easy to use, proven framework
- Capable of on-going development by Optalert with assistance as required
- Speed – data accessibility and transactional processing
- Flexibility – deployment, access, language
- Scalability – potential for thousands of users, around the world
- Robustness – ensure database integrity and high availability
- Security – Authentication, encryption, auditing



## Due diligence involved a number of DBMS systems

- In-house pre-existing knowledge / experience
- 3<sup>rd</sup> party reviewers e.g. Gartner Research
- Costs – development and on-going
- Selection and “test” of outsourcing application development utilising existing SaaS “traditional” architecture developed for Transport / Freight (6 months)
- Refinement of requirements based on first test “failure”
- Commenced discussions with InterSystems

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## Due diligence included

- Discussions with current Caché users
  - Sonic Healthcare (4000 licenses in Australia)
  - 1000 bed Hospital (150 licenses)
  - Optimate Pty Ltd (Faceguard system)
- Workshop at InterSystems Melbourne demonstrating Caché and DeepSee.
- On-going face-to-face meetings & discussions to answer more specific queries e.g. hardware specifications and “connectivity” options
- Recommendation by InterSystems of Integrated Software Solutions to develop the application.

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## InterSystems Caché and ISS

- Combination of;
  - Caché Server Page model using Dynamic Server Page Technology generating content programmatically at run time.
  - Zen™ provides pre-built object components and tools based on the CSP and DSPT technology, which would speed development, and, as importantly, allow for “simple” modification at a later date
  - Integrated Software Systems application framework and ISS Q-Writer for reports development
- Provided highly interactive and consistent Web interfaces.
- The technology ensured application development from start-up to fully functional deployable in 80 (workings) days

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## Decision

Upon examination of;

- What we knew of various DBMS
- What we needed
- The “unknowns” we knew/know of

The decision pathway lead us to Caché

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## Optalert WebReport – Main Menu

- Main Menu
  - Data Management
  - Data Upload
  - Information
  - Reports
  - System
  - Tools
- Also page-specific Help, Favourites selection, Close, and Sign out available for all pages

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## Application development

- Commenced development week of April 20<sup>th</sup> 2009
- Fully functional application underwent final validation testing last week which was completed last Friday afternoon.
- Development time – 80 working days.
- Reports development using ISS Q-Writer 1.4 commenced last week.
- Customer acceptance trial to commence last week of August
- Roll-out of Optalert Web Reporting offering to current customers commencing mid September

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## Optalert WebReport – Data Management

- Based on the “List-then-Detail” information delivery model e.g. “List” Sites → select required Site → display “Details”
- Primary Data points;
  - Company and Sites
  - Driver – person allocated Optalert Glasses
  - Glasses
  - Processor System
  - Subscriber – person requiring access to Reports only
  - Vehicle

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## Optalert WebReport – Data Upload, Information, and Reports

- Able to “manually” select data to upload to WebReport
  - Vehicle System via configured USB Flash Drive
  - Future: Wireless upload and download
- Content Writer and Viewer for Help with ability to link documents, images, web pages, etc
- Reports and Schedule Viewer – saved reports, individuals reports schedule e.g. start & end date, status, etc
- Reports List – what reports, output types and format e.g. PDF, HTML, RTF, XLS, XML

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## Optalert WebReport – System

- Audit Profiles – Configuration, File Attachment, Menus and Links, Operator
- Menu Maintenance
- Operators – who has access to what
- Report Utilities – Import/Export etc plus access to SQL Designer to modify Schema, Tables, Index, and SQL Statements
- Roles – OptalertAdmin, OptalertSupport, OptalertClient
- Scheduler – includes output email configuration and report scheduler



## Challenge during development – data relationships

- Processor ID assigned to Vehicle
- Vehicle linked to Site (mining) or Division or Company (road transport)
- Site linked to Division, linked to Company
- Glasses ID registers with Processor
- Processors can be reinstalled (multiple vehicles)
- Vehicles can be re-assigned to another site



## Challenge – Immediate Information

- Immediate “Real-time” warnings transmission to Customer Operations centre
- Some customer sites have poor or limited internet access, but do have WiFi/WiMax systems
- A large portion of customers on-site computer hardware is, in general, quite old e.g. Pentium, Pentium Pro, Pentium 11

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QUESTIONS ?  
Presenter: Don Cameron

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