

Internal and Confidential

Netradyne IDMS Product Plan & Procedure

v3.3

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# Purpose

This document is a Netradyne Product plan and Procedure document, align stakeholders on product goals, communicate the strategic direction and roadmap, manage scope and resources effectively, and provide a basis for decision-making and progress tracking throughout the development lifecycle.

# Scope

**I**ntelligent **D**river **M**onitoring **S**ystem (IDMS) is cloud-based SaaS solution that offers fleet management, feedback about driving behavior and coaching abilities. IDMS process driving data and videos uploaded by AI-Enabled Dash-Cam installed on vehicles.

# Roles and Responsibilities

Roles and responsibilities specific to this document are included below:

|  |  |
| --- | --- |
| **Role** | **Responsibilities** |
| Owner | * Team or SME responsible for the process area needs to ensure this document is up to date and compliant with governing requirements. * Is the point of contact for the document. * Responsible for initiating and managing document review and the approval process from start to finish including gathering or delegating the collection of content including diagrams, formatting etc. as well as identifying stakeholders to participate in the peer review process. |
| Reviewers/Stakeholders | Representations from teams that can affect or be affected by the document under review (e.g., Operation, Security, Compliance, Quality) |
| Approvers | The Person(s) of authority to validate the document and sign-off on the latest version. Such Person include Document owner, Functional Team Lead, Security Lead, Product Delivery Lead. |
| Document Release | Document Owner/team to work with repository administrator to make release version available. |

# Procedure

Product description

**I**ntelligent **D**river **M**onitoring **S**ystem (IDMS) is cloud-based SaaS solution that offers fleet management, feedback about driving behavior and coaching abilities. IDMS process driving data and videos uploaded by AI-Enabled Dash-Cam installed on vehicles.

Following are high-level features of IDMS Portal that helps fleets optimize fleet and driver performance.

### Dashboard

**Fleet Performance**: Fleet Performance is the landing page that displays an overview of safety related information about the fleet. There are various parameters like - Most Frequent Alerts, Top three drivers with highest Green Zone score and bottom three drivers who need attention.

**Fleet Admin Tab**: The safety manager can also view the summarized view of administrative issues that require attention in Fleet Admin tab of Dashboard.

### Alert

Alerts help in monitoring the driver performance and address any events that are caused; and prevent them from happening in the future. There are various types of alerts, for example, **Dashboard Alerts** are based on vision analysis of Outward and inward cameras. **In-Cab Audio Alert** type warns the driver of an impending violation.

Netradyne also recognizes positive driving events and awards **Driver Stars** to them. The events directly impact the **GreenZone Score** of the Driver. The GreenZone Score summarizes “Safe” driver behaviour down to a single number. It is computed based on the positive events like Driver Stars, Neutral Events, and Coachable alerts.

### Event Access

IDMS allows you to access a video for any time up to several hours of drive. It can be done using the event access page. There are also additional tools available on this page to help you identify the video you would like to request for viewing, for example, list view, the map view, speed and accelerometer charts and filter panel on the right side.

### HD Video

Driveri has four cameras providing 360-degree view of the vehicle. The HD videos provide indisputable evidence in protecting against false claims and improved driver behaviour during the drive time. It is a powerful tool in communicating with drivers about their performance.

### Trends

The insight and trends help enhance the driver performance and make decisions. There is multiple chart available on the portal that allows to compare how a given driver is preforming with respect to other drivers and fleet average or fleet goal.

### Coaching Sessions

Alerts and trends are important tools for coaching the driver. Coaching session is where you can view and collect information while preparing to coach the drivers. The driver’s coaching history can be referenced and documentation of completed coaching can be maintained.

### Notification

You can configure the Notification Preference in case you would like to be informed of any specific types of events / alerts either on App or via email.

### Vehicle Locator/Live Tracking

Vehicle Locator feature can locate all the vehicles for a fleet. Vehicle positions are refreshed every 30 minutes.   
Live Tracking is a premium feature available on subscription to the Customer. Live Tracking can help you track all the vehicles in real time on the map in a single view.

### Provisioning and Configuration

The safety manager can manage drivers, vehicles, devices, and their associations here. The fleet or group-wide notification preferences can also be defined here.

High Level Architecture

A screenshot of a cell phone

Description automatically generated

IDMS provides:

* REST endpoints to accept communications from device.
* IDMS Web portal and Mobile Apps provides data useful for end-users.
* API platform provides REST APIs and Webhooks for data integration with customers.

IDMS includes:

* Asynchronous workers for offline processing of data.
* Interfaces with AWS IoT to push notifications to devices.
* Device status, and health monitoring.
* Cloud analytics, for second-pass analytics and inward pass analytics.
* Video annotation services.
* Video cropping services.
* Maps services.
* Open Street Maps.

IDMS has the following components:

* REST API services to process and output data.
* Asynchronous task processor, task consumers.
* Python modules for second pass analytics.
* Python modules for inward pass analytics.
* Python modules for video annotation.
* Python modules for video cropping.
* Python modules to identify and fetch “interesting” videos for training.
* Python modules for monitoring device status, and health.
* PostgreSQL 13, as the RDBMS.

IDMS uses these services from AWS:

* EC2, as hardware abstraction
* S3, for long term durable storage
* AWS IoT, for cloud to device communications
* Lambda, for IoT related functions, and periodic tasks
* SQS, queues to communicate between various components.
* SES, for transactional email
* ELB, for load-balancing
* Route 53, for DNS
* RDS, experiments to offload self-hosted RDBMS.

Skill Set requirements.

**Full Stack Developers:**

* Building products, dealing with streaming big data to be used for automotive application.
* Hands-on Experience with Spring, iBATIS or related frameworks
* Good command on JavaScript and frameworks like AngularJS. Understanding of Responsive design frameworks like Bootstrap
* Strong experience designing high performance, highly scalable, multi-tenant solutions.
* Strong handle on various networking protocols, and Unix tools
* Strong knowledge of OOPs Concepts, data structures and algorithms
* Strong knowledge of database internals – RDBMS and NoSQL
* Experience building products using distributed computing platforms like Apache Spark and/or Storm is desirable.
* Strong hands-on experience of 3-6 years building API centric Java/J2EE applications.
* Knowledge and hands-on experience with Unit testing frameworks in the relevant area

**Back-end Developers:**

* Strong programming experience in Java
* Strong Comp Sc. fundamentals esp. communications, algorithms, and data structures
* Strong understanding of internals and schema design for various types of Data stores (RDBMS, NoSQL)
* Full stack development experience using with Spring, iBATIS, AngularJS and related frameworks is desirable.
* Experience building and running live products with platforms like Apache Spark and/or Storm is desirable.
* but not required.
* Strong handle on various networking protocols, and Unix administration tools for performance optimization
* Knowledge of OOPs concepts

**Font End Developers:**

* Hands-on industry experience of 6+ years in UI (portal) development.
* Good understanding of JavaScript and exposure to frameworks like AngularJS /React JS.
* Good understanding of REST APIs and web protocols.
* Working knowledge of dealing with huge data.
* Understanding of OOPs concepts, data structures and algorithms.
* Understanding of database (RDBMS /NoSQL)
* Working knowledge of cloud infrastructure (AWS/Azure)

**Mobile App Developers:**

* Experience in Android/iOS and React-Native development.
* Experience in XCode/Android-Studio/Visual-Code and GIT.
* Ability to take up end-to-end responsibility of the deliverables including interaction with Cloud, Sales, Ops, QA teams etc.
* Experience with RESTful APIs to connect mobile applications to back-end services.
* Experience with offline storage, threading, and performance tuning of mobile apps.
* Experience with Wi-Fi, Bluetooth, Multimedia and Sensors.
* Experience in publishing apps on app stores.

**Operations Engineers:**

* Python, RDBMS
* Well versed with Unix commands
* Good understanding of the tools for configuration management and ticketing like Git, Jira, etc.
* Excellent communication skills (Written and verbal)
* Critical thinker and problem-solving skills
* Strong Ownership
* Mentoring a small team technically
* Optional skills (Good to have): AWS, IoT, Mongo DB, Spark
* B Tech/M Tech/MS in Computer Science or a related field from a reputed university

**QA Engineers:**

* Good working knowledge of RDBMS like Postgres and/or NoSQL databases like MongoDB.
* Experience in writing Automation frameworks for UI/API/ for cloud
* Good understanding of web application
* Exposure to build and Continuous integration systems.
* Experience with Functional, Usability, Regression, Integration, Security and Performance tests
* Expected to perform manual tests as per needs of the product, while maintaining focus on automation

**DevOps Engineers:**

* B Tech/M Tech/MS in Computer Science or a related field from a reputed university.
* Total industry experience of around 6–10 years.
* Programming experience in Python, Ruby, Perl, or equivalent is a must.
* Good knowledge and experience of configuration management tool (like Ansible, etc.)
* Good knowledge and experience of provisioning tools (like Terraform, etc.)
* Good knowledge and experience with AWS.
* Experience with setting up CI/CD pipelines.
* Experience, in individual capacity, managing multiple live SaaS applications with high volume, high load, low-latency and high availability (24x7).
* Experience setting up web servers like apache, application servers like Tomcat/WebSphere and databases (RDBMS and NoSQL).
* Good knowledge of UNIX (Linux) administration tools.
* Good knowledge of security best practices and knowledge of relevant tools (Firewalls, VPN) etc.
* Good knowledge of networking concepts and UNIX administration tools.
* Ability to troubleshoot issues quickly is required.

All engineers undergo periodic training on handling sensitive data. Our workforce receives regular Security Awareness, compliance, and role-based training opportunities. New hires complete security awareness training within 90 days of being hired. Additionally, employees have specific mandatory training requirements, including the protection of Personally Identifiable Information (PII), Protected Health Information (PHI), and other sensitive business data, which are monitored continuously.

Product Development Strategy

We follow agile methodology for product development. Requirements and priorities are constantly updated based on customer feedback.

We create a PRD for each project and follow it up with execution. All customers are notified of new features and change requests.

Resource Planning

Work is taken up based on available resources and their bandwidth. We have adequate resources and backup for each component.

Change Management

All the product changes are managed and tracked using JIRA. All changes are tracked using a requirement document. Changes once implemented are verified with the customer before closing the request.

Defect Management

All the product defects are logged and tracked using JIRA. Defects are prioritized over feature development based on the severity and impact.

Quality Assurance

Our QA engineers do tests using well defined checklist before every release. Additionally, we rely on automation and unit tests for quality assurance. Automation suite is constantly updated to be in sync with the latest state of system.

Performance Testing

There is a separate environment setup for performance testing. Production like environment and load is emulated to catch issues that might arise in production.

Source Code Management

Github.com is used for source code management. The access to the source code has restricted access for Netradyne employees to repositories based on their role. The access is protected via two factor authentication. All commits are signed.

Release planning

We follow a continues integration and deployment strategy. Features are planned for a quarterly basis and deployments happen on a weekly basis to meet the quarterly targets.

Risk Management

Our risk management plan is to be agile and respond to new developments. We rely on automation and monitoring which helps us manage risk.

**Information Security Requirements**

Security requirements should be considered at all stages of a project lifecycle, for a new system or changes to an existing system.

Following practices should be followed:

### Threat Modelling

Security test cases are run against the new proposed design to validate that the design does not introduce security flaws or weaknesses in the system.

### Vulnerability Assessments

Vulnerability assessment is performed to identify, document, and mitigate vulnerabilities, threats, and risks.

### Architecture and Design Reviews

### Security experts collaborate closely with software architects to ensure adherence to security best practices and compliance checks, including but not limited to HIPAA and GDPR, for any design change or new designs. This partnership aims to uphold data protection standards and regulatory requirements, mitigating risks associated with potential design alterations and ensuring robust security measures are integrated into the software development process. Peer Reviews

All code changes are peer reviewed to ensure best coding practice and conformance with security requirements.

The following aspects should be considered while evaluating security requirements.

1. Authentication and Authorization – Ensure only relevant users/systems can access information or perform operation.
2. Ensure all the sensitive PII and PHI information is protected – data is encrypted when in transit or rest.
3. Ensure data integrity – Utilize Signature / Hashing if applicable.
4. Ensure availability – High Availability should be considered in design.

**Access Control – Application and System**

All the applications and systems require password-based authentication. The 2-factor authentication is enabled for high privilege roles. Authorized checks are performed using role permissions. Only privileged staff have access to the production system.

To access the production servers, staff need to be on a separate VPN, access to which is provided on a needless basis.

The 2-Factor authentication is mandatory to access most of the services like AWS, and GitHub.

The production and lower environments are separated. Access is controlled using IAM policies.

# Conduct

Compliance Checks to this process to be performed through various methods, including but not limited to reports, internal/external audits, Awareness training/assessments and feedback to the process owner. Non-compliance will be escalated to the Netradyne leadership team.

# Exception

Exception to this procedure must be approved through the Netradyne Exception Process.

# Terms/Acronyms

|  |  |
| --- | --- |
| **Term/Acronym** | **Definition** |
| IDMS | **I**ntelligent **D**river **M**onitoring **S**ystem |
| PII | Personally Identifiable Information |
| PHI | Protected Health Information |

# References

Policies

[Information Security Policy Statement - Netradyne - 2021.pdf](file:///C:/Users/Hemchand/Downloads/Information%20Security%20Policy%20Statement%20-%20Netradyne%20-%202021.pdf)

# Appendix A: Document RACI Matrix

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Role/Activity | Document Owner/Functional Area Lead | Document Contributor | ND Leadership | Functional Area Team | InfoSec | All ND Member(s) |
| Ensure document is kept current | A | R | I, C | R, C | C | I |
| Ensure stakeholders are kept informed | A | R | - | R | C | - |
| Ensure document contains all relevant information | A | R | I, C | R, C | C | I |
| Ensure document adheres to document governance policy | A, R | R | I | R, C | R, C | I |
| Provide SME advice | I, R | A, R | I | R, C | I, C | I |
| Gathering and adding document contents | I | A, R | I, C | R, C | C | I |
| Document Approval | A | R | I, R | I | I, R | I |

|  |  |
| --- | --- |
| Key |  |
| R | Responsible |
| A | Accountable |
| C | Consulted |
| I | Informed |