Warrior Performance Platform for U.S. Navy
Leveraging Best-of-Breed Human Performance Tracking and Analytics Technology to Enhance Navy's Physical Fitness, Wellness, and Nutrition Capabilities

2019 Human Systems Conference
17 APRIL 2019

Kevin Dawidowicz – President /Founder
CoachMePlus
kevin@coachmeplus.com

Jake Repanshek – Director
TIAG
jrepanshhek@tiag.net
Cutting Edge Expertise

TIAG brings a history of transformational leadership advancing military medical science and telehealth technology

- Leads web application efforts at DoD’s National Center for Telehealth & Technology (T2)
- Delivers cutting-edge health IT solutions (e.g., VA’s open-source EHR)
- Developed the Army’s Research Management Enterprise System, providing autonomous big data management across numerous laboratories

Delivering end-to-end individual training and readiness solutions for DoD, WP2 leverages TIAG’s demonstrated military experience and technical expertise

- Quick, all-in-one-place information access empowers leaders to determine risk factors and take immediate action
- Warriors are operationally ready and less likely to sustain injuries that keep them out of the fight

SAMPLE OF EXISTING CUSTOMERS

CIRQUE DU SOLEIL

INDIANAPOLIS COLTS

UCLA BRUINS

BUFFALO BILLS

“Just having the opportunity to talk to players based on what we saw today – helped them.”

Brian Kelly
Head Coach
Notre Dame Football

“We are doing everything we can - to help prevent the injuries that can be preventable.”

Geoff Head
Sports Scientist
San Francisco Giants

“CoachMePlus is helping us ensure everyone is fully informed and prepared”

David Good
Strength Coach
Nashville Predators
Centralized Collection of Human Performance Data

• Integrates data from virtually any available source
• Enables reporting and metrics at any level, from the individual to the enterprise
• Immediate and long-term data for “ready to perform” decisions
• Advanced analytic capabilities
• Secure, accreditation-ready platform

Advancing Proactive Human Performance Management

• Centralization of data enables proactive decision making
• Automates manually intensive data collection and analysis
• Amplifies effectiveness of human performance initiatives
• Delivers information at the right time to the right person

Speed of Information

• Rapidly discover and locate outliers
• Enable timely interventions
• Increase accountability
• Assesses key performance indicators of entire units and each individual Warrior’s capability to advance mission

Human performance tracking and analytics to enhance physical fitness, wellness, and nutrition capabilities.

WP2 monitors Warriors throughout the readiness cycle, informing key command decision makers to support mission and training adjustments. Provides the ability to uncover trends, develop insights, reduce risk, and customize training programs. Leaders measure human performance based on preparation, physical fitness, strength and capabilities.
A Costly Problem

10% of the total active Soldier force is NON-DEPLOYABLE.

90% of Musculoskeletal Injuries (MKSI) are from PHYSICAL TRAINING or sports-related.

80% of Musculoskeletal Injuries (MKSI) are considered OVERUSE IN NATURE.

$4B is spent each year DUE TO INJURIES, non-deployable Soldiers, accidents and other health-related costs.

WP2 Benefits

BENEFITS DERIVED FROM MONITORING SOLDIERS

• **Enhance operational readiness** through improved fitness, wellness, and nutrition
• **Reduce stress-related injuries** through monitoring and timely intervention
• **Deploy training and fitness programs** targeted to specific populations
• **Employ “distance coaching”** and compliance monitoring
• **Centrally store and manage** human performance data
• **Automated reporting** at all levels, from the individual to the enterprise

CONTRIBUTING FACTORS IN THE REDUCTION OF INJURY RISK

INTERNAL LOAD: CARDIO, RPE
EXTERNAL LOAD: PERFORMANCE STATS
FATIGUE
HYDRATION
STRESS
SLEEP & RECOVERY
PAIN & SORENESS

Core WP2 Capabilities

- **HOLISTIC HUMAN PERFORMANCE PROFILE**
  - WORKOUT BUILDER / TRACKER
  - SUBJECTIVE WELLNESS TRACKING
  - WEARABLE DEVICE INTEGRATION
  - PDFS, NOTES, VIDEOS, PHOTOS, DOCS
  - SCHEDULING, MESSAGING, NOTIFICATIONS
  - DASHBOARDS AND REPORTS
  - MOBILE AND TABLET ACCESS
  - DATA IMPORT AND EXPORT API
Profile/Cluster Examples

APPLIED MONITORING

Not a One-Size-Fits-All Approach – How much should be tracked in a pilot deployment?

POPULATION GROUPING

GENERAL POPULATION
GOAL: Behavior Change / Education
- Hydration
- Workouts

AT-RISK POPULATION
GOAL: Remediation / Return to Duty
- Sleep / Pain / Mood / Stress
- Fitbit / MyFitnessPal
- Workout Compliance / Body Comp
- Fatigue / Soreness

SPECIALIZED POPULATION
GOAL: Optimized Performance
- Force Plate
- Range of Motion/Movement Screen
- Cardiac Load
- Velocity Based Training

STAFFING REQUIREMENTS

Limited Staff / High Automation
- Force multiplier
- Warrior self-selection of programming and content
- Warrior engagement through app notifications and automation

Specialized Staff / High Customization
- Create efficiency with practitioners
- Explore multiple data and testing configurations
- Integrate with specialized hardware, software, military systems
- Leverage existing systems and expertise
NAVY SBIR N171-079 PHASE II
HUMAN PERFORMANCE SELF-SERVICE
KIOSK & APPLICATION

OBJECTIVE: Develop a platform with interactive touch screen, such as a self-service Kiosk, that displays human performance information, serving as an education tool for the user of afloat and shore based galleys.

BASE: 16 AUG 2018 – 28 FEB 2020
OPTION: 28 FEB 2020 - 27 NOV 2020

NAVSUP
• Prototype development is underway
• Builds upon core WP2 functionality, but adds:
  • Nutrition
  • Ruggedized touchscreen kiosk
  • Support for austere environments
  • Shipboard integration
  • Data source integrations (Naval Operational Fuel and Fitness System, MyPlate and Go for Green)
    • Full cybersecurity accreditation
• Supports app-based access from personal mobile devices, as well as data integration from select wearables
• Focus on automated, “self-service” capabilities to reduce need for manual intervention at scale
• Initial operational testing scheduled for FY20
• Programming can be configured and assigned for the individual based on Sailor’s goals, environmental or physical limitations or restrictions.

• Sailors can select any exercise from the library and add activities to their day, including NOFFS programming.

• Review their completed exercises and review trends of the data over selected periods.

• Achieve the Sailor’s fitness goals as well as determining the nutritional needs and proper recovery protocols to enhance readiness and performance.

• Monitoring the Sailor’s physical activity will help the Sailor assess how the performance was achieved, as no two Sailors react the same to physical stress.

WP2 with Exercise with Video
• Provide the Sailor with an intuitive interface for capturing subjective information.
• Trend the Sailor against himself or herself before we look at the data as a population
• Main subjective data points
  ✓ Sleep
  ✓ Mood
  ✓ Stress
  ✓ Soreness / Pain
  ✓ Fatigue
• Educate the Sailor on why we are tracking the data, including showing them data trends.
• Intervention occurs and is communicated during meaningful changes in the results.
Task 3: Develop a Nutrition Module

• Data Integration
  • Naval Operational Fuel & Fitness System (NOFFS)
  • Navy Go for Green (G4G)
  • Recipes from The Armed Forces Recipe Service (AFRS) and Joint Culinary Center of Excellence (JCCoE)
  • United States Department of Agriculture (USDA)
  • Caloric, Micronutrient, Macronutrient and other key indicators from databases

• Providing educational content through the 3D Human Anatomy and the Library will engage the Sailor and encourage compliance through compelling animations, videos, documents and interfaces which keeps the Sailor tracking in the right direction towards their fitness goals.

Figure 4.8: Meal Detail sample
USDA Data integrated with Search and Selection Functionality

Next steps = Go For Green, NOFFs Data
SBIR PHII N171-079

Functional Integration Demonstration (1st Iteration – 01 JAN 2019)

Real-time data integration into single REDI Profile for Sailor.
• Select the most effective method for delivering individual performance, activity, wellness, fatigue, sleep, and other data into the Sailor’s REDI profile.

• Integrate the live data web-enabled backend technologies with the selected wearable devices, either through API or other method.

• Manage unsynchronized PWFD data in a shipboard environment.

• Implement latest Pentagon guidance on GPS-enabled devices

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wearable Device Integration</td>
<td></td>
</tr>
<tr>
<td>Task 6 (Base)</td>
<td></td>
</tr>
<tr>
<td>6.1 PWFD Selection Process for Software Prototype</td>
<td></td>
</tr>
<tr>
<td>6.2 PWFD Data Integration Software Development</td>
<td></td>
</tr>
<tr>
<td>6.3 PWFD Data Integration Synchronization Development</td>
<td></td>
</tr>
<tr>
<td>6.4 PWFD Demonstration of Data Integration Prototype</td>
<td></td>
</tr>
<tr>
<td>6.5 PWFD Develop Interfaces and Workflows</td>
<td></td>
</tr>
<tr>
<td>6.6 PWFD Demonstration of Interfaces and Workflows</td>
<td></td>
</tr>
<tr>
<td>Task 14 (Option)</td>
<td></td>
</tr>
<tr>
<td>14.1 PWFD Live Environment Hardening and Prototype Iterations</td>
<td></td>
</tr>
<tr>
<td>14.2 PWFD Demonstration of Live Integration, Interfaces and Workflows</td>
<td></td>
</tr>
</tbody>
</table>
• Internet capability for operating in a rugged and often less than favorable shipboard environment.
• Available memory to support 10,000 Sailors’ data
• Design the kiosk to work with mobile devices, including smartphones and tablets
• We present a Demonstration of Live Environment Prototype in a secure live data environment
Challenges

• Cybersecurity Considerations
  – Cloud hosting/SaaS model
  – Personally Identifiable Information
  – Protected Health Information
  – Reciprocity between organizations
• Synchronization in Austere Environments
  – Shipboard
  – Theater
• Authentication alternatives
• Adoption/Buy-In

Future State

• Advanced Analytics / Machine Learning
  – Predictive vs. Reactive
• Mental/Behavior Health Applications
  – Post-traumatic Stress Disorder (PTSD) Event Detection
  – Traumatic Brain Injury Assessments
• External Integrations with Systems of Record
  • MHS GENSIS? DMDC?
  • Cross-service compatibility
QUESTIONS