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ML-Powered

3D Posture Assessment From Simple Mobile Photos

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Client Challenge

The client is a **digital health platform** focused on **musculoskeletal assessment, posture analysis,** and **preventive care.**

They needed a scalable way to assess posture and body alignment without expensive hardware or fully manual evaluations.

The challenge was clear:

01
Remote posture assessment from mobile photos

02
Accurate, objective body measurements

03
Less reliance on manual visual checks

04
Better tools for physical therapists

05
Reduced therapist workload and burnout

06
Fast scan-to-report processing

07
Secure handling of sensitive health data

Incorrect measurements could lead to poor treatment recommendations, so **accuracy, speed, and compliance** were critical.

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Solution Delivered by Zfort Group

Zfort Group built a full **ML-powered health scanning ecosystem** for mobile posture analysis and clinical reporting.

The platform included:

- iOS and Android mobile scanning apps
- **3D reconstruction pipeline from just 4 photos**
- Automated measurement engine
- **40+ body parameters** calculated automatically
- Posture deviation analysis
- Patient-friendly reports
- Provider-specific reports for doctors and physical therapists
- Movement plan generation logic
- Backend platform and APIs
- Secure cloud infrastructure
- Admin and user portals

The result: mobile scanning with **no additional hardware,** fast insights, and objective posture data for care teams.

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Posture Intelligence Engine

The platform turns simple user photos into structured, clinically useful posture intelligence.

Key capabilities:

- **Body landmark detection**
- **Pose estimation**
- **Image segmentation**
- Image preprocessing with OpenCV
- 3D processing with Open3D
- TensorFlow and PyTorch neural networks
- Anatomically accurate 3D model reconstruction
- Scaling, smoothing, artifact reduction, and rotation correction
- Asymmetry detection not easily visible to the human eye
- Data analytics layer for measurements, deviations, and reporting

Think: **faster assessments, better consistency, less manual measuring.**

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Security & Compliance

Built for sensitive healthcare data:

01 **Security by Design**

02 HIPAA-aligned architecture

03 ISO 27001-aligned infrastructure and processes

04 Data anonymization

05 Minimal data exposure

06 Secure service communication

07 Role-based access control

08 Secure cloud processing

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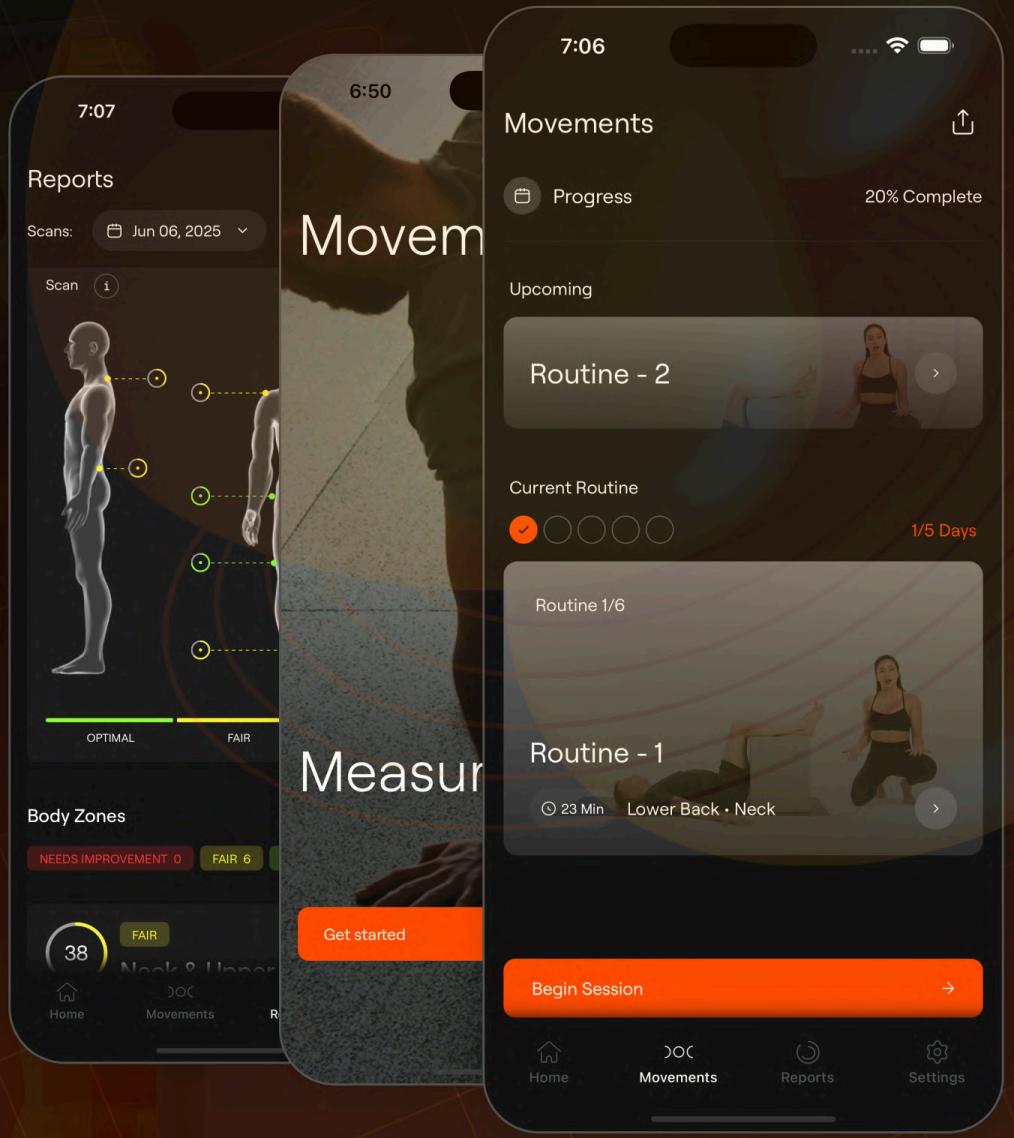
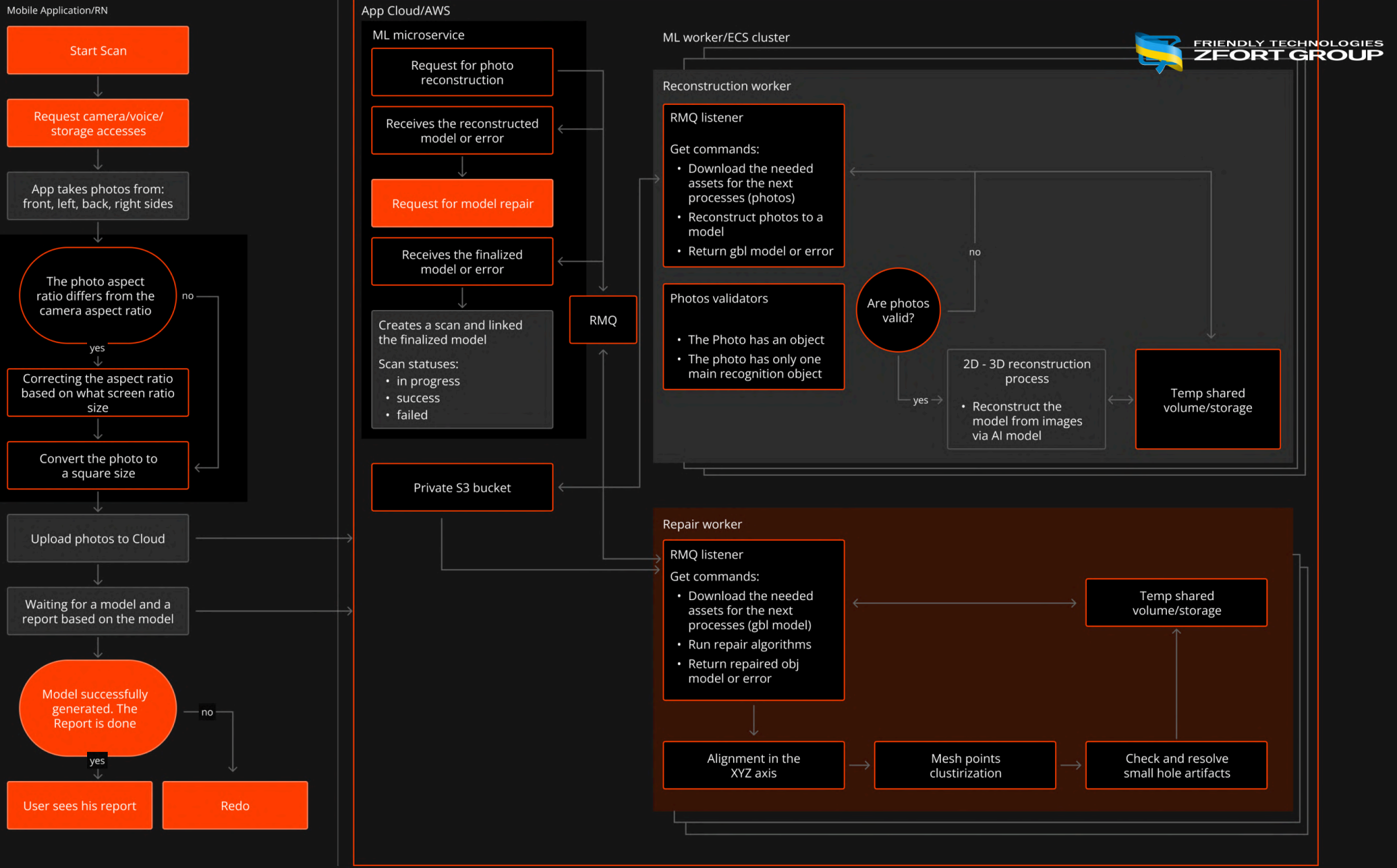
Results & Impact

- **3-5 minute scan-to-report processing**
- **40+ body parameters calculated automatically**
- **~90% reduction in manual measurements**
- **46% reduction in physical therapist assessment time**
- **Time spent on paperwork drastically reduced**
- Improved scan consistency
- Lower hardware and operational costs
- Stronger trust through HIPAA and ISO-aligned security
- Better experience for patients and providers




Mobile Application/RN
Start Scan
Request camera/voice/ storage accesses
App takes photos from: front, left, back, right sides
The photo aspect ratio differs from the camera aspect ratio
no
yes
Correcting the aspect ratio based on what screen ratio size
Convert the photo to a square size
Upload photos to Cloud
Waiting for a model and a report based on the model
Model successfully generated. The Report is done
no
yes
User sees his report
Redo
App Cloud/AWS
ML microservice
Request for photo reconstruction
Receives the reconstructed model or error
Request for model repair
Receives the finalized model or error
Creates a scan and linked the finalized model
Scan statuses:
• in progress
• success
• failed
RMQ
Private S3 bucket
ML worker/ECS cluster
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Reconstruction worker
RMQ listener
Get commands:
• Download the needed assets for the next processes (photos)
• Reconstruct photos to a model
• Return gbl model or error
Photos validators
• The Photo has an object
• The photo has only one main recognition object
Are photos valid?
no
yes
2D - 3D reconstruction process
• Reconstruct the model from images via AI model
Temp shared volume/storage
Repair worker
RMQ listener
Get commands:
• Download the needed assets for the next processes (gbl model)
• Run repair algorithms
• Return repaired obj model or error
Temp shared volume/storage
Alignment in the XYZ axis
Mesh points clustirization
Check and resolve small hole artifacts

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Why It Matters for Medical Professionals

Physical therapists need fast, objective, and easy-to-understand posture data.

This platform helps move assessments from manual visual checks to **ML-assisted, measurement-based decision support.**

The result: **faster evaluations, clearer reporting, less repetitive work, and better patient communication.**

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Zfort Group's HealthTech Advantage

01
AI/ML powered healthcare platforms

02
3D reconstruction and computer vision

03
Mobile-first digital health products

04
Automated clinical measurement tools

05
Provider-focused reporting

06
HIPAA-aligned delivery

07
ISO 27001-aligned security practices

08
Scalable cloud infrastructure for global digital health products

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Contact Information

To coordinate next steps please contact:

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