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OTOSCAN - 3D EAR SCANNING: THE FUTURE IS NOW!

**Jackie Allen Phillips, AuD | National Account Manager, Otoscan,
December 17, 2018**







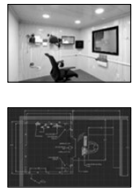


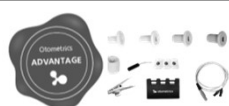
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1

OTOMETRICS BACKGROUND

Product Portfolio

Five main product lines connected by proprietary software and supported by dependable service offering

Fitting  AURICAL FreeFit AURICAL Aud	Hearing Ass.  MADSEN Astera MADSEN Zodiac	Screening  MADSEN AccuScreen MADSEN Alpha OAE	Balance  ICS Chatr ICS Impulse	Sound rooms Customised project-based solutions 
Otoscan <ul style="list-style-type: none"> Digital Ear Scanning Optimized HA Ordering Enhanced Workflow Increased Pt. Satisfaction 	Software <ul style="list-style-type: none"> Audiology software Vestibular software EMR connectivity Total installed base of ~15,000 	Service and Other <ul style="list-style-type: none"> Service offering Spare parts Accessories & disposables 3rd party products 		

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Learner Outcomes

- After this course learners will be able to discuss how 3D scanned ear images are used as a tool during hearing aid consultation to engage, educate, motivate potentially improve outcomes, communicate value and differentiate their practice.
- After this course learners will be able to describe how custom hearing devices could help providers differentiate and segment their offerings from over-the-counter options.
- After this course learners will be able to describe how Otoscan utilizes two different lasers to obtain a complete and accurate scan of the patients ear canal.

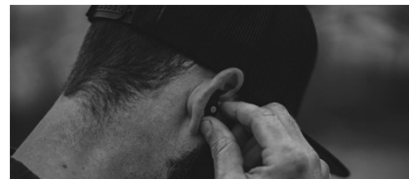
Why Digital Ear Scanning?

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Navy Grant for 3D Scanning & Printing

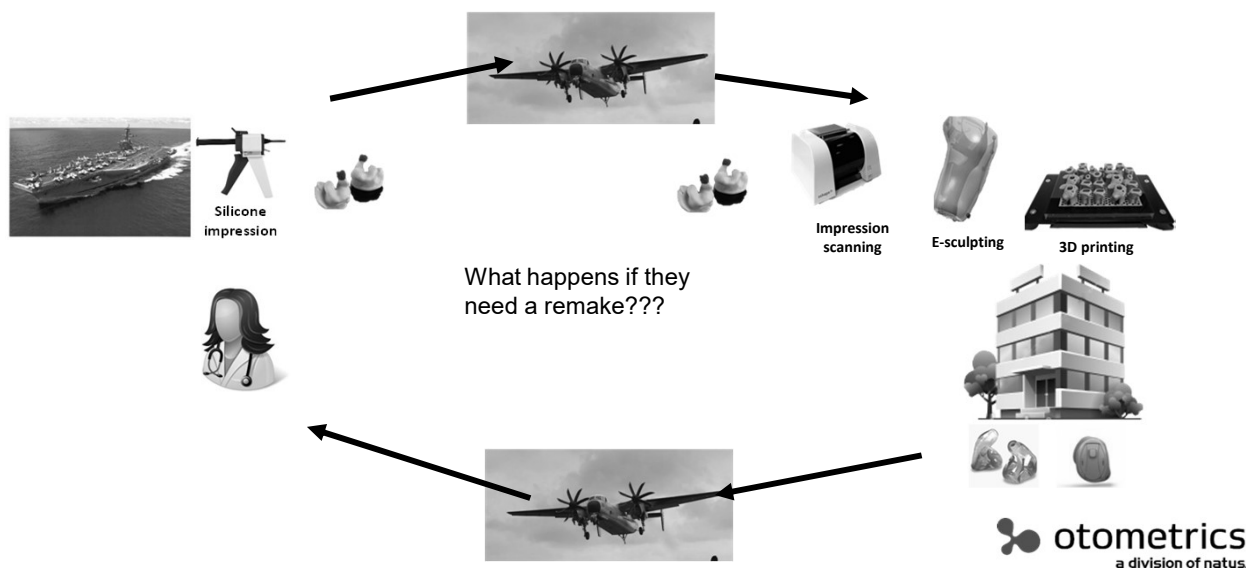
Human Performance Enhancement for NATO Military Operations (Science, Technology, and Ethics)

- Office of Naval Research Warfighter Performance Department
- Karol Hatzilias
 - mechanical engineer from Georgia Tech specializing in 3D tech
 - awarded a grant by the United States Navy to develop a 3D scanning technology
 - Goal to provide hearing protection for warfighters in an effort to reduce psychological stress/PTSD.
- As a result of that he invented a way to scan small holes with a ring laser and translate that scan into a 3D model in real time.
- The Navy was looking for the **Optimal Process** for Custom Devices



5

Traditional Custom Product Workflow for Navy

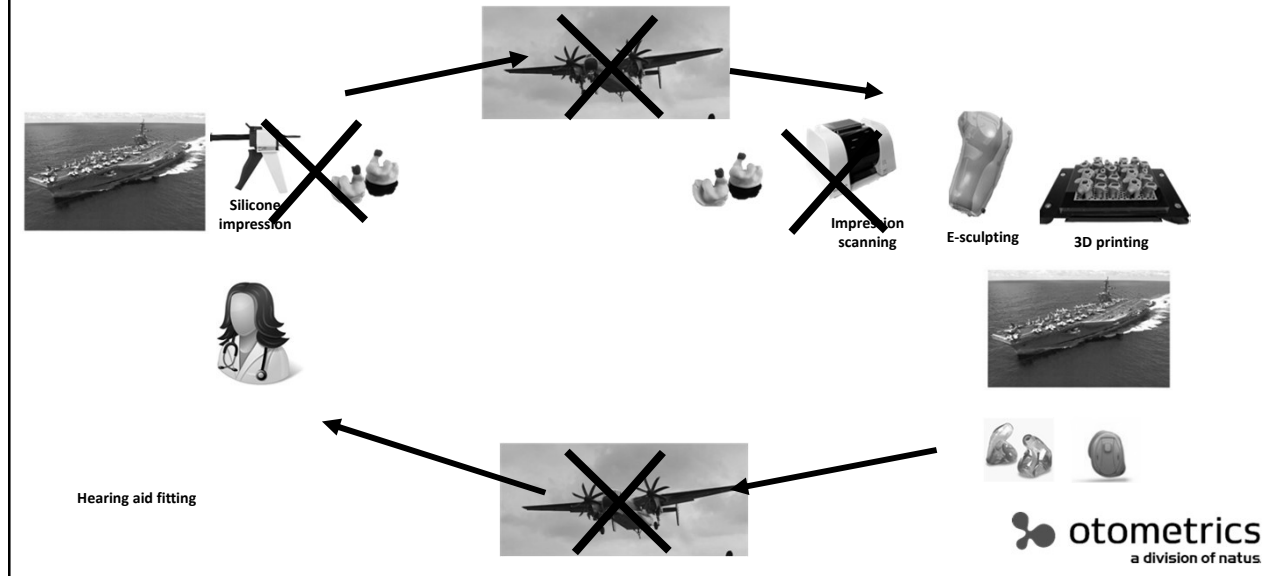


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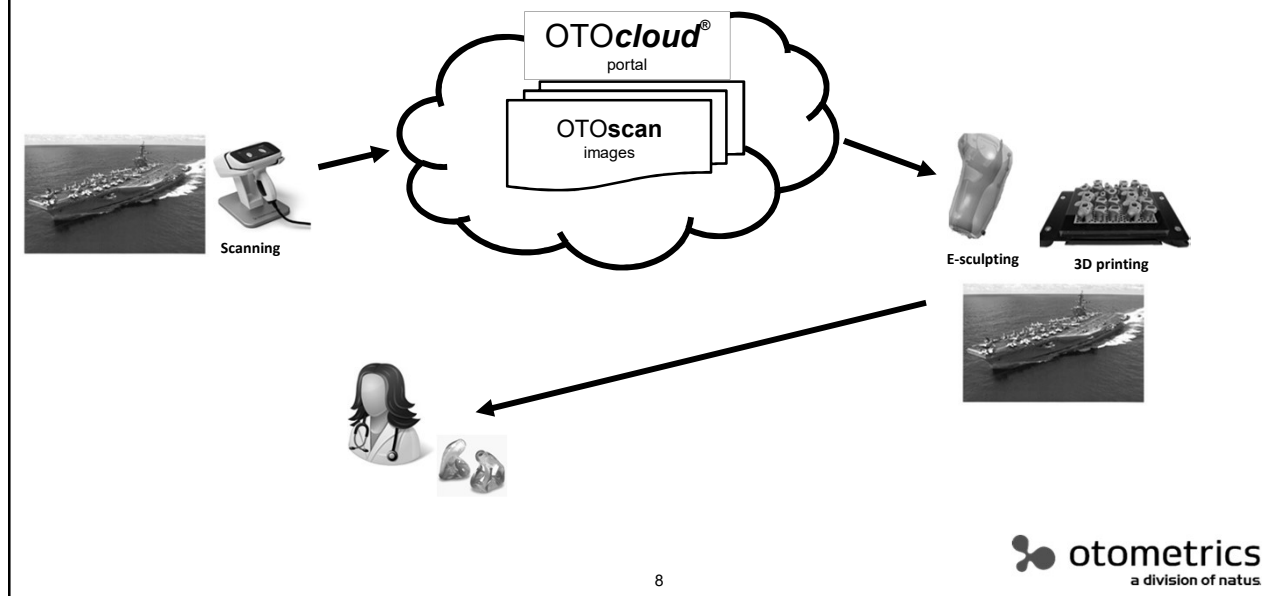
OTOSCAN BUSINESS MODEL

Traditional Custom Product Workflow



OTOSCAN BUSINESS MODEL

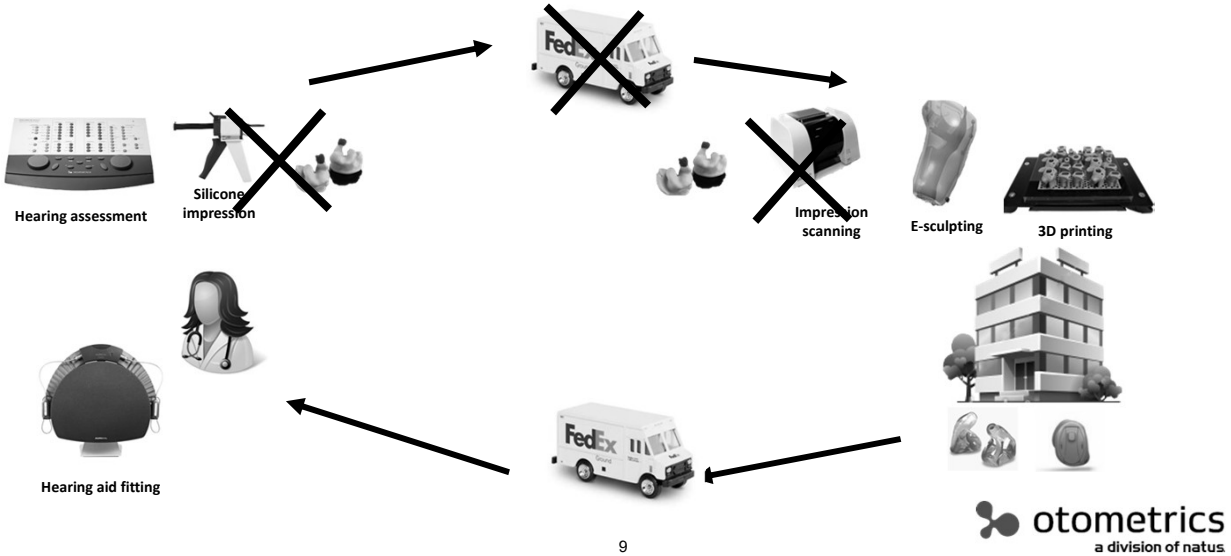
Navy's Enhanced Custom Product Process



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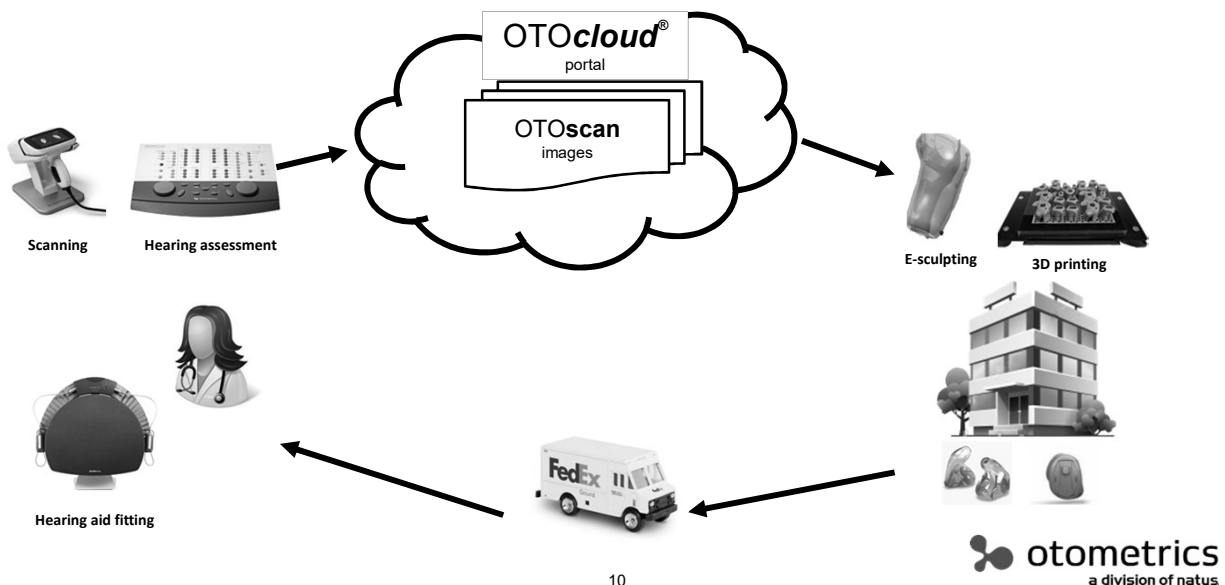
OTOSCAN BUSINESS MODEL

Hearing Aid Clinic | Traditional Order Processing



OTOSCAN BUSINESS MODEL

Hearing Aid Clinic | Enhanced Custom Ordering



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Changes in the Industry...

CUSTOM HEARING AIDS

Hearing Aid Styles

INDUSTRY NEWS

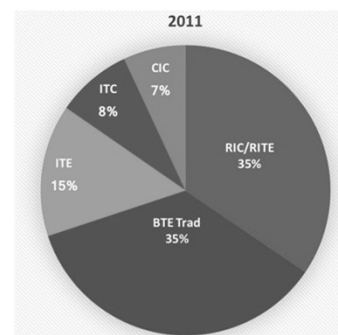
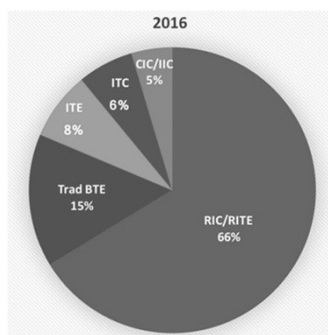
US Hearing Aid Unit Sales Increased
by 8.7% in 2016

Published on January 16, 2017

Updated February 9, 2017

Hearing Review Article shows:

- Decreased Customs Mix, especially in ITEs
- Decreased Tradition BTE usage
- Significant increase in RIC/RITE
- No statistics on whether custom earmolds were used



Jf3

CUSTOM HEARING AIDS

OTCs

August 18, 2017

FDA Reauthorization Act of 2017 signed by President Trump

- *Includes the Over-The-Counter Hearing Aid Act*
- It mandates the FDA to establish an OTC hearing aid category for adults with “perceived” mild-to-moderate hearing loss within 3 years of passage of the legislation
- *FDA to pose regulations for new category by August 2020*

What do we know so far?

- OTC hearing aids will use “**same fundamental scientific technology as [...] hearing aids**”
- OTC hearing aids will be “available over-the-counter, without the supervision, prescription, or other order, involvement, or intervention of a licensed person, to consumers through in-person transactions, by mail, or online.”
- They will be for **adults only** (18+ years old)
- They will provide adequate amplification for **mild-to-moderate hearing loss**
- The user will be able to control their OTC hearing aids and customize them as they see fit
- OTC hearing aids may include **self-assessment tests**
- OTC hearing aids may include wireless technologies



13

OTOSCAN VALUE PROPOSITION

What's occupying today's HCPs?

FOCUS AREAS

- Stay professional
- Best possible outcomes for patients
- Excellent patient experience
- Running an efficient business
- Stay competitive

OTOSCAN

How can 3D scanning support the professional?

TRENDS

- Consolidation and increased competition for consumer awareness
- Baby boomers expect high quality services and individualized health care
- Over-the-counter hearing care on the rise (on-line, pharmacy...)
- ASP shrinking, efficiency must increase
- Digitization of the patient journey rapidly progressing



14

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Slide 13

Jf3 Empower our audiologists to document cases where OTC was insufficient

Jeanette fitzke, 10/10/18

CHANGES IN THE INDUSTRY

Personalization

bcg.perspectives
by THE BOSTON CONSULTING GROUP

PROFITING FROM PERSONALIZATION

By Mark Abraham, Steve Mitchellmore, Sean Collins, Jeff Maness, Mark Kistulinc, Shervin Khodabandeh, Daniel Moening, and Jody Visser

PERSONALIZATION IS CAUSING A seismic shift across the landscape of consumer-facing brands, and we are only starting to feel the shocks. Already brands that create personalized experiences by integrating advanced digital technologies and proprietary data for customers are seeing revenue increase by 10 to 15%, according to our research—two to three times faster than those that don't. As a result, personalized brands stand to capture a disproportionate share of category profits in the new age of individualized brands while other brands will lose customers, share, and profits. Over the next five years to three decades alone—retail, health care, and financial services—personalization will push a revenue shift of some \$600 billion to the 15% of companies that get it right. Here's what the leaders are doing.

Digital Natives Have Built an

around collecting data and responding to customer needs. These companies build strong customer loyalty using both traditional vehicles, such as loyalty programs, and new models, like "first" and short-term digital delivery, automatic replenishment, and other forms of convenience. The deeper digital connection enables digital natives to more fully understand what customers need and create new ways to serve them, both independently and by working with suppliers. Personalization will take another big evolutionary step as voice recognition and cognitive-computing systems gain mainstream traction.

In many consumer categories, high-value customers drive 70% or more of the value for companies. Brand individualization unlocks the ability to enhance loyalty with these (and other) customers by tailoring the brand experience to each customer's unique journey. From Netflix's made-for-me jump from mailing DVDs to streaming

Brands that create a personalized experience by integrating digital technologies and proprietary data for consumers are seeing up to a 10% revenue increase

Examples:

- Online hearing screenings
- Personalized Hearing Aid
- Custom Products?
- Utilize Otoscan in Counseling?
- Personalize components and tech in HA/Hearable?

***Personalize your offerings and
Bring Back Custom Products***



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15



Meet Otoscan

3D digital ear scanning solution from Otometrics

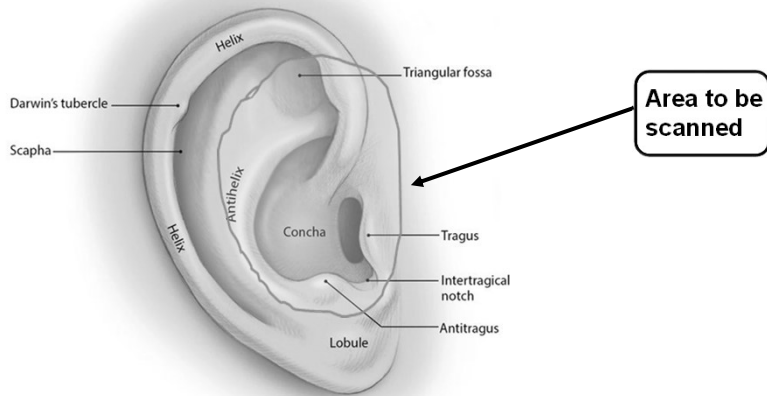
Developed BY hearing care professionals FOR hearing care professionals

16

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Brief Review of Pertinent Anatomy



17

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Key Otoscan Features

- Live In Ear View
- Live 3D Rendering View
- Insertion Depth Gauge
- Gamified Training Application
- Easy Infection Control Process
- No Disposables



18

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Otoscan Scanner Components

Scanner components — seen from the probe side

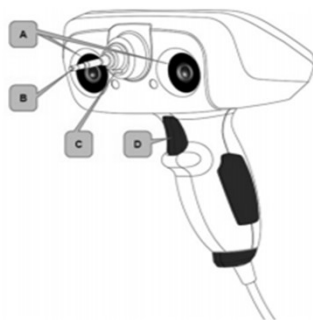


Fig. 5 The hand-held scanner, seen from the probe side.

A. Tracking cameras

Cameras on either side of the probe detect the tracking ring of the headset worn by the patient. The cameras track the position of the scanner in relation to the patient's ear. To function properly, the cameras' view of the tracking ring must remain unobstructed.

B. Ring laser

Scans outwards from the tip of the probe (E on Fig. 6 ► 12). Scans the canal (in **Canal Ring** mode) and the curved portions of the pinna such as the helix, sidewalls of the concha, and intertragal notch (in **Concha Ring** mode).

C. Line laser

Scans in front of the probe tip in a horizontal line (in **Pinna Line** mode), similar to a bar code scanner. It is used for scanning the flatter parts of the pinna, such as the center part of the concha bowl, and ridges at the edge of the concha.

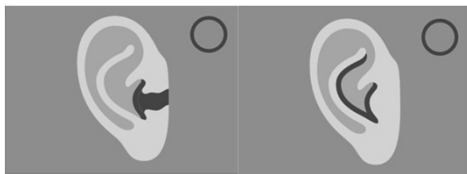
D. Trigger button

Selects the most common next action, based on the current state of the device. If more than one action is available, the most common next action is shown highlighted on the screen. For example, you will use the trigger to set the depth gauge and start a scan. During a scan, you can press the trigger to pause the scan.

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Types of Lasers used in Otoscan to Scan Ear

Ring Laser



- **Utilize the Ring Laser to scan the ear canal and curvature of pinna**
- The laser projects perpendicular to direction of the probe.
- Strobe light for ear canal but not pinna

Line Laser

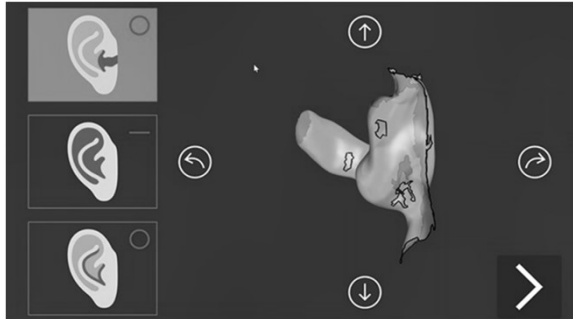


- **Use the Line Laser to scan the flat surfaces**
- Think of "line-of-sight"

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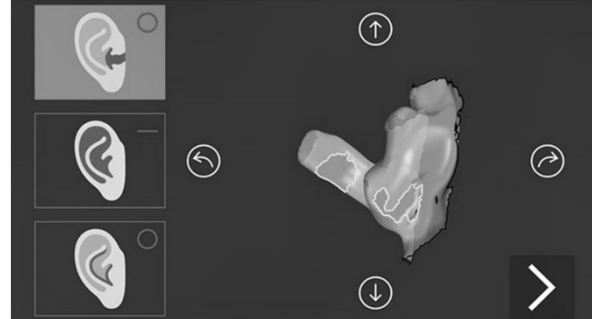
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How do you know scan is complete?



The border color around the holes signifies whether or not you should collect more data in that area.

Black Border = OK



The border color around the holes signifies whether or not you should collect more data in that area.

Yellow Border = Incomplete



21

Scan Real Ears - Contraindications

Excessive wax

- A small amount of wax is acceptable but, like with silicone impressions, a clean ear results in a better "impression"
- If excessive wax is present, either do not scan the ear or have the wax removed prior to scanning. After cleaning the ear, make sure that excessive moisture is not present prior to scanning

If the patient has undergone recent ear surgery

If there is discharge or evidence of infection

If the patient is unable to remain still

If the patient experiences a persistent cough reflex (Vagus nerve reflex)

If the patient has a history of seizures, migraines or any sensitivity to strobe light, reduce volume and have them close their eyes for the 1st portion.



22

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The Complete Digital Solution

Scanner System Components

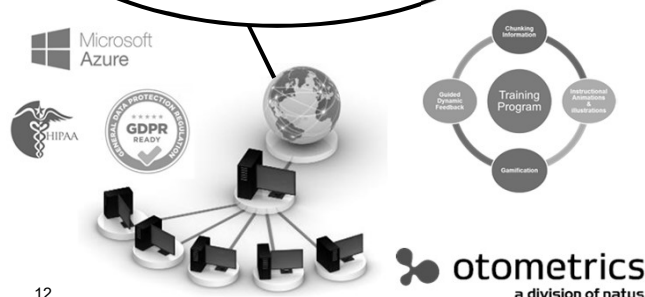
- Scanner with USB connection
- Single Application Locked-Down PC
- Session Manager
 - Patient database
 - Scanning
- Patient-worn tracking headset

Scanner System



Otoscan Portal - Otocloud

- Web-based Portal software
 - User / clinic admin
 - Scan management
- Accessible from any desktop / pc through dedicated user name & login
- Includes manufacturer business system



12

Training of Otoscan

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Learning Curve Expectations

Learning to scan is a process

- Just think how many ears it took you to feel comfortable w/ Silicone

Practice builds confidence and skill

- 5-7 patients for comfort in basic scanning technique
- 15+ patients to build a skill set for confidence scanning

Scan time (length of time to complete a scan)

- Scan times will start out long (6+ minutes per scan)
- Scan times will drop to less than 2 min on average

Compared to Average silicone process takes around 10 minutes



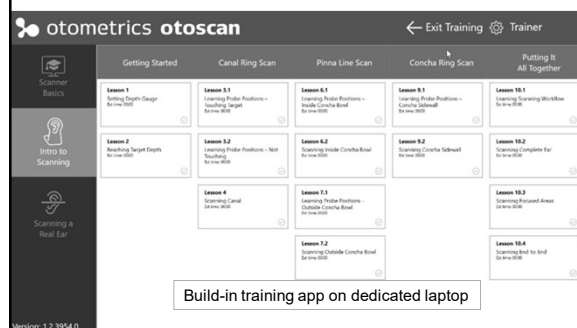
25

OTOSCAN COMMERCIALS

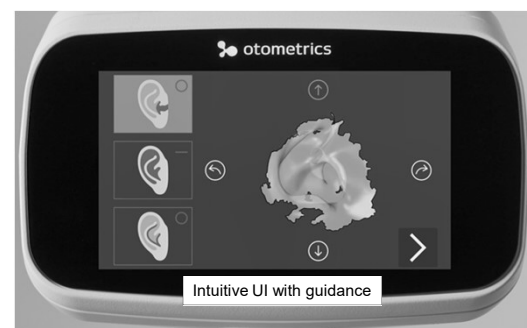
Easy onboarding and roll-out

Time management is of extreme essence in the front-line POS. Otoscan accommodates an efficient product roll-out into organizations considering introducing new routines.

1. 27 build-in lectures (video, gamification)
2. Training session (recap and transition to real ears)
3. Building patient cadence in the clinics (~10-20 patients building muscle memory)



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Otoscan Training Software

Live Digital Rendering & In-Ear View

Depth Gauge

Blue = Shallow Insertion
Green = Target Depth
Red = Insertion Warning

Target Depth

Male = 16-18 mm

Female = 14-16 mm

Based on:

- 1) Literature Reviews on avg ear canal length
- 2) HIMS Recommendations



27

Status of Otoscan

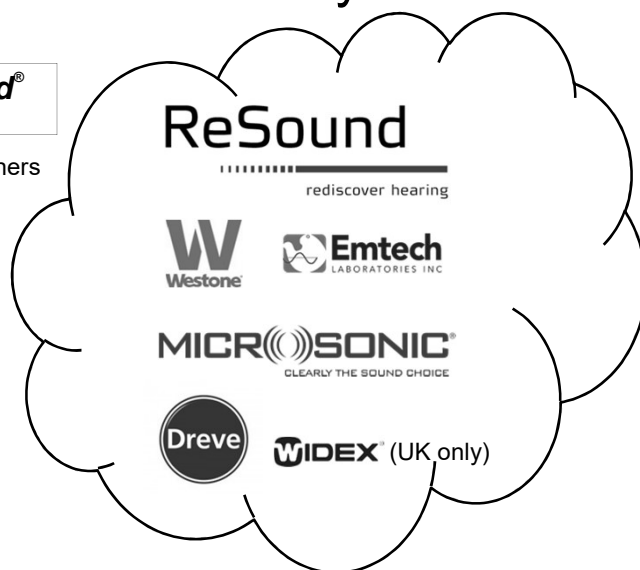
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Otocloud Community - Partners

Otocloud®
Community

Current Partners



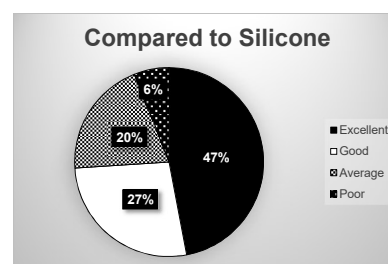
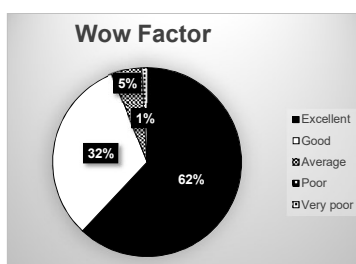
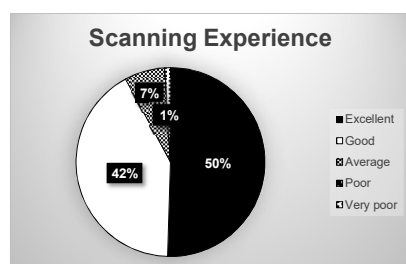
The goal is to on-board all of the major Hearing Instrument Manufacturers globally.

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29

PHASE 1 TRIAL STATUS

Patient feedback



- 92% of patients reports excellent/good comfort
- 94% of patients reports scanning has a wow factor
- 74% of patients reports it better than silicone impression procedure
 - *New scan operators vs experienced silicone impression takers*

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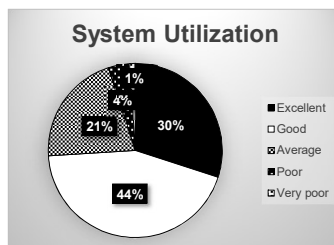
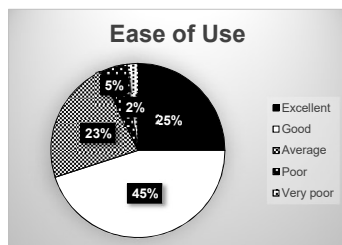
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PHASE 1 TRIAL STATUS

Operator feedback



- 70% success in reaching target depth and no gaps
 - Only 7% with difficulties
- 74% success in utilization of the scanning system

31

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Otoscan is the future of hearing care counseling and changes the way you provide hearing care

Otoscan gives you powerful new ways to attract and engage more clients while delivering personalized counseling and solutions in an efficient way

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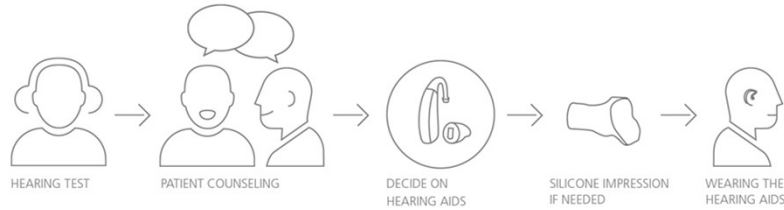
OTOSCAN

Revolutionize the Workflow: Please more patients

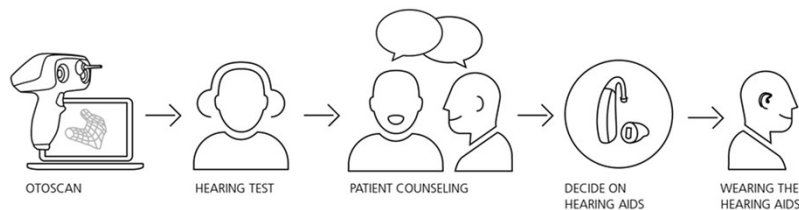
... into a strong asset

OLDA passive
delivery
mechanism

WORKFLOW:

**NEW**Engage
with
patients

WORKFLOW:

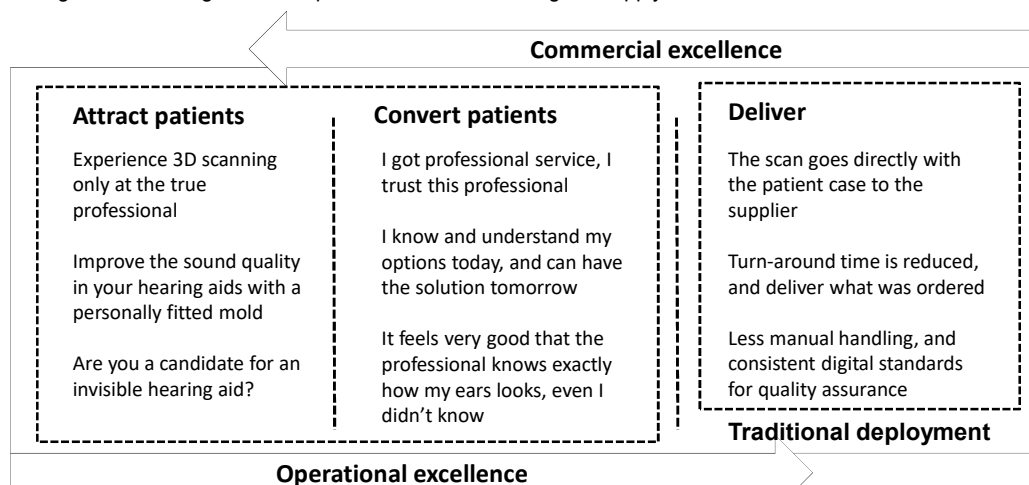

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33

OTOSCAN BUSINESS MODEL

3D ear imaging offers a step change in hearing care

Frontloading the counseling and sales process, and modernizing the supply chain



Converting a passive “delivering mechanism” into a **strong asset** for counseling and sales

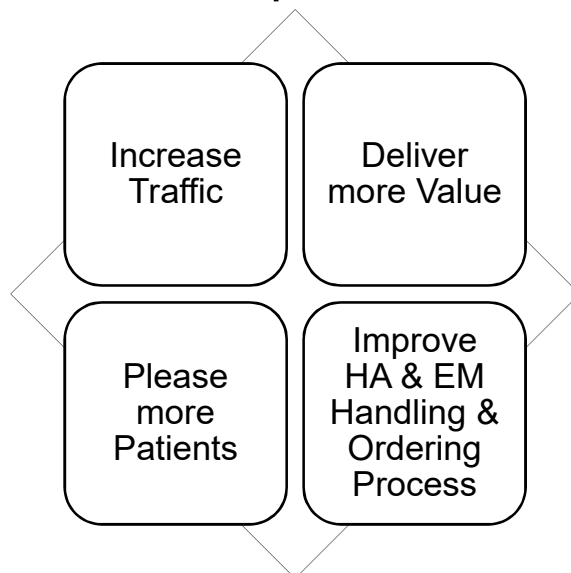
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Benefits of Improved Workflow



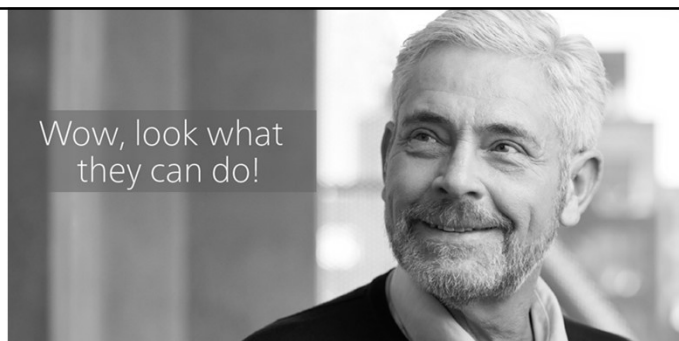
35

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Facebook Events

To promote the Open Days effectively we devised and implemented an integrated strategy which included creating Facebook Events, Facebook targeted/re-targeted campaigns and email marketing. This allowed us to target the right people with the right message on the most relevant platforms.

Wow, look what they can do!



Attract more patients

Otoscan® helps you create awareness, interest and excitement around your clinic with the latest technology within hearing care counseling. Otoscan is the first 3D ear scanning solution developed by hearing care professionals for clinicians just like you. Now you can bring the Wow Factor to your clinic and:

- Excite your patients with new digital ear scanning technology
- Reach more patients and grow your referral base through community health care events showcasing the latest innovation within hearing care
- Deliver customized hearing care and differentiate your practice



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Please more patients

Otoscan gives you more ways to engage with patients and establish stronger patient relationships. With the scanning process, you create a relevant context to begin a dialogue with your patient so you can:

- Establish a strong rapport and personalize the patient's experience in your clinic
- Increase patient loyalty by making their experience memorable
- Help patients answer the question: "Can I get the hearing aid I want?"
- Make a professional impression by being the clinic that provides customized hearing care



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Streamline processes

Otoscan® helps you deliver customized hearing care in an efficient way. Otoscan streamlines the process of producing custom in-the-ear pieces such as earmolds and hearing aids. Novel technology transforms images of the ear into 3D digital files that are uploaded to Otocloud®, a cloud service for immediate use in the production of custom products. You can:

- Save time and money on handling earmolds and hearing aids
- Secure digital patient records for easy storage, retrieval and use
- Ensure a better fit and reduce remakes and returns
- Enjoy a cleaner, safer procedure

"Our goal is to keep earmold turnaround time to a minimum. Otoscan helps us cut our shipping time and cost by fifty percent. That's a huge time and cost savings for us."

Peter D. Sotiropoulos, Au.D., FAAA, Doctor of Audiology
Hearing Rehabilitation Center, Kankakee, IL



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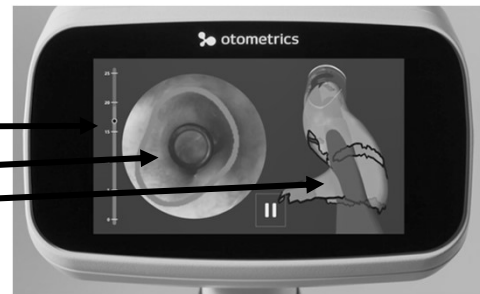
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Financials of Otoscan

Optimized Value Chain – Lower Remake rates

Otoscan has build in features that allows for the optimization of processes by enhancing the quality of the origin of the value chain for custom hearing aids – the patients ear.

- Insertion depth (consistently scanning 4-6 mm passed 2nd bend, with a newly trained operators).
- Video otoscopy view for safer navigation
- 3D rendering ear canal surface
- Supplemented by a thorough Sonova validation study



Moving towards that Otoscan can be used as an encouragement for making a stronger effort at securing a good scan the first time.

In a US trial (Q4 2017) the remake rate was ~8% (16 out of 196 orders, representing 425 scan images). Traditionally, remake rates range between 15-20% - significant improvement with Otoscan!

- For dispensers doing custom: freeing up time to sell more!
- For dispensers not doing customs: reducing risk in pursuing custom solutions

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Otoscan Pricing

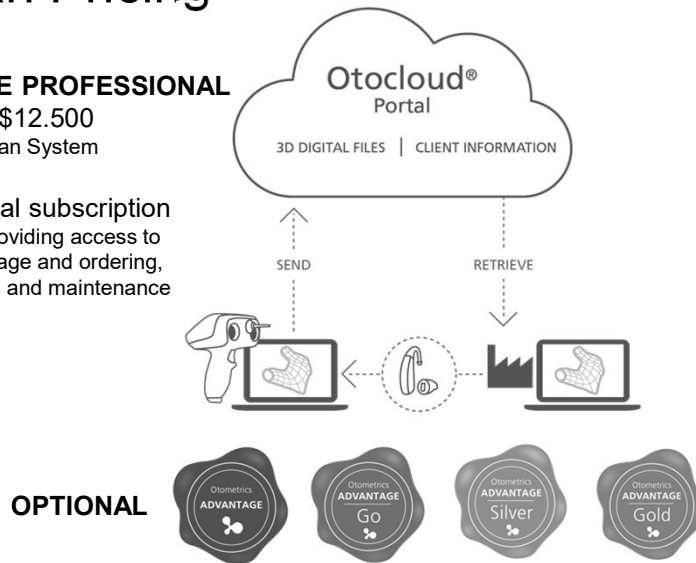
HEARING CARE PROFESSIONAL

#1: Capital Inv.: \$12,500

- Complete Otoscan System

#2: \$1,250 annual subscription

- SaaS element providing access to Otocloud for storage and ordering, software updates and maintenance
- (first year is free)



41

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Thank You

Come with us

It's the way forward

itsthewayforward.com

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847-217-3419 - cell

42

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