

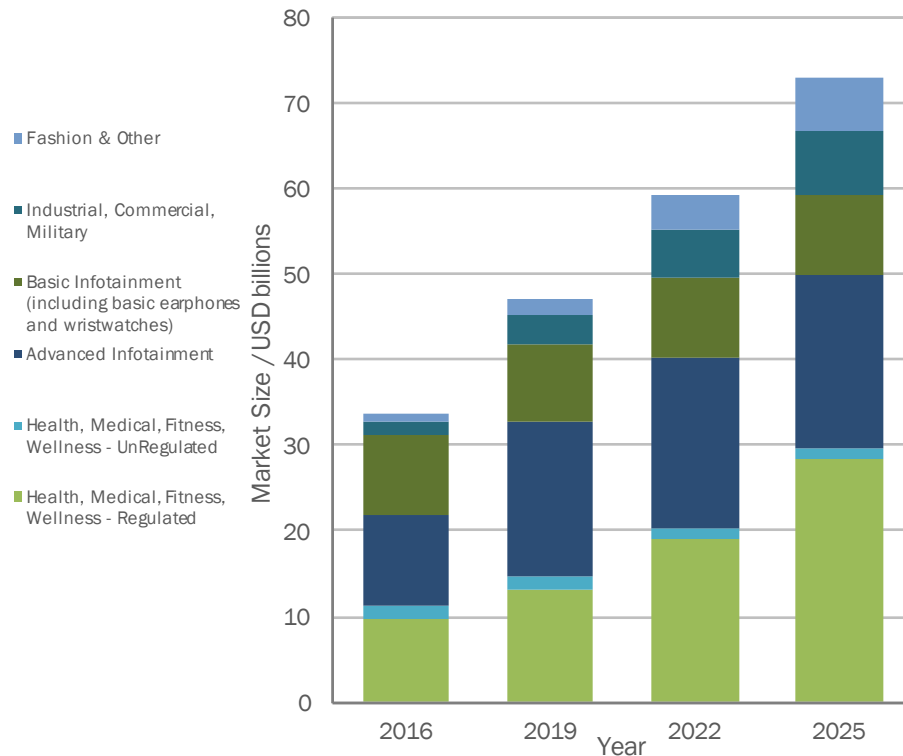


# Novasentis, Inc.

## It is all about resonant frequency!

March 24<sup>th</sup>, 2016

# Wearables Market is Hot



- The market for wearable devices is forecasted to grow to \$70b by 2025 at a 11% CAGR<sup>1</sup>
- Smart watches set to reach 135 M units in 3 years<sup>2</sup>
- 10% of the world population to be wearing a connected wrist worn device by 2019<sup>3</sup>

1: IDTechEx Wearables Report 2015

2: CCS insight Wearables Forecast

3: Pyramid Research: Devices for the Wrist

# Problem: notification features are not working well

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Home / Reviews / Consumer Electronics / Wearables / Sony SmartBand SWR10

## Sony SmartBand SWR10

EDITOR RATING: GOOD 1 COMMENT

REVIEW COMMENTS SPECS COMPARE

**PROS**  
Innovative, versatile design. Waterproof. Beautiful app. Lots of...  
*wanted for state square*

**CONS**  
Flinicky band close-up process. C... notifications. B...

**FORTUNE** FEBRUARY 9, 2015 U.S. stocks have best week in two years

TECH LOGGED IN

### Fitbit's new bands: Fit for tracking, but not for thinking

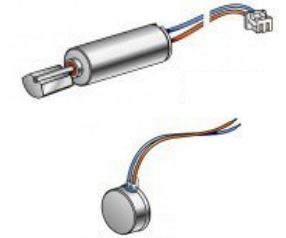
by Jason Cipriani @MrCippy FEBRUARY 3, 2015, 6:11 PM EST

“annoying buzz”

“Confusing Notifications”

“The vibration for an incoming call is brief and easy to miss”

“I just wish notifications were handled differently.”



# Apple pushing the boundaries with the Taptic Engine

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Home / Reviews / Consumer Electronics / Wearables / Smartwatches / There's Only One Reason to Buy an Apple Watch

**There's Only One Reason to Buy an Apple Watch**

BY EVAN DASHEVSKY SEPTEMBER 12, 2015

The Apple Watch was underwhelming, but

251 SHARES

COMPUTERWORLD

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MORE BY MIKE ELGAN

**The Apple Watch and our cyborg future**

Home > DESIGN > CREATE > VIDEO

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Microsoft Cloud

**21 THINGS I DIDN'T KNOW ABOUT THE APPLE WATCH UNTIL I STARTED WEARING ONE**

INTIL I DISCOVERED THAT A TINY DEVICE THAT'S BURSTING AT THE SEAMS WITH NEW IDEAS, FEATURES, AND APPROACHES

BY HARRY MCCracken

TECHFORECAST

TECHNOLOGY IS EVOLVING AT A BREAKNECK PACE. STAY AHEAD OF THE CURVE WITH TECH FORECAST, AS WELL AS OUR COVERAGE FROM SXSW AND THE ULTIMATE GEEK MOMENTS.

READ MORE >

My first week of wearing the Apple Watch has transformed my thinking about the direction of mobile and wearable computing



Instead of vibrating furiously like other smartwatches, the Apple Watch do something that feels like a genteel nudge. It's far classier and less distracting.

The taptic engine is what sets the Apple Watch apart. Without the taptic engine, the Apple Watch is just a beautiful digital trinket. With it, however, the device becomes much more.

# Does Size Matter?



It is all about resonant frequency





# Resonant Frequency

$$f_n = \frac{1}{2\pi} \sqrt{\frac{k}{m}}$$

Resonant Frequency

Stiffness of the spring

Mass of the spring

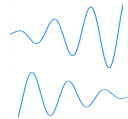


# Richer Notifications



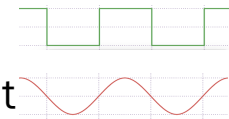
## Training/Motivational

- Run faster effect
- Run slower effect



## Distinguish

- critical info
- infotainment



## Directional information

- effect on the left
- effect on the right





# Novasentis Solution

- Enables sleek & aesthetically pleasing devices
  - Film based actuators: thin, light, flexible
  - Actuators are embedded in the wrist band
- Each actuator activated independently
- Discrete, reliable communications
  - Different effect profile
  - Pattern: left or right
  - Low frequency



# What will smartphones look like in 2020?

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Most Major Credit Cards Welcome

Steve Cichon of Trending Buffalo shows that an iPhone can replace \$3,054.82 worth of electronics sold in Radio Shack in 1991


# Device Evolution = much larger TAM

*As wearables evolve, will we still need our phone?*



Today wearables are smartphone companion devices

Improved performance  
Lower cost  
Flexible device technology



Tomorrow wearables will be our primary device

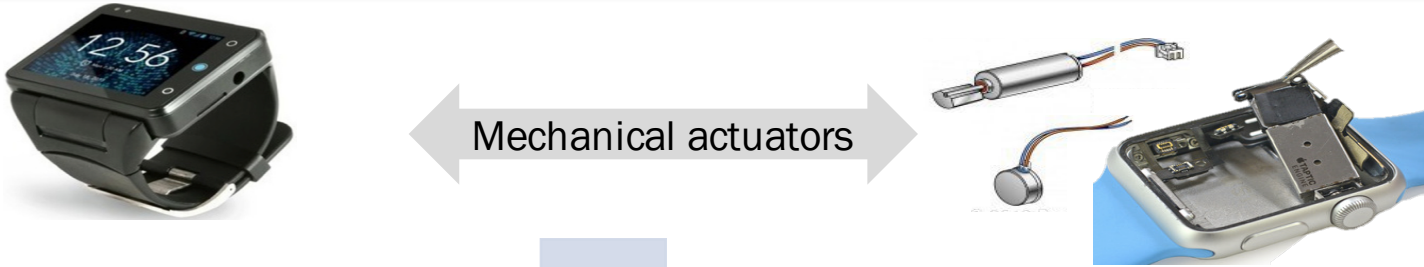
Smartphone subscription in 2020 will be 6B units<sup>1</sup>

1- Ericsson Mobility Report Nov 2014

# Favorable Trend

*Novasentis Enables Tomorrow's Devices*

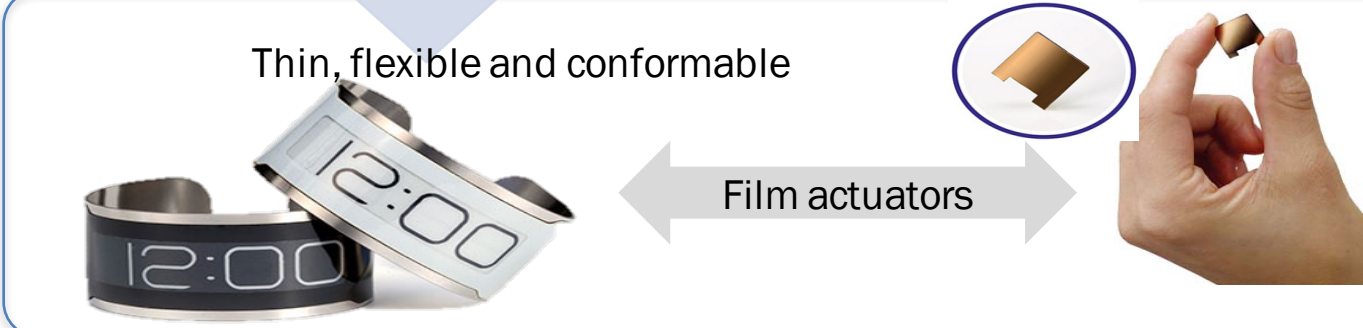
Rigid & bulky



Mechanical actuators

This section illustrates a rigid and bulky smartwatch. On the left is a black smartwatch with a digital display showing '12:56'. To its right is a grey double-headed arrow labeled 'Mechanical actuators'. Further right is a detailed view of a mechanical actuator component, which is a cylindrical metal part with a small circular disc at the end, connected to a thin wire. This component is shown being inserted into the back of a silver smartphone.

Thin, flexible and conformable



Film actuators

This section illustrates a thin, flexible, and conformable smartwatch. On the left is a flexible smartwatch band with a digital display showing '12:00'. To its right is a grey double-headed arrow labeled 'Film actuators'. Further right is a hand holding a small, square, gold-colored film actuator component. A blue circle highlights the actuator, and a blue arrow points from the hand towards the flexible watch band.



**Thank you!**

Visit Novasentis on [www.novasentis.com](http://www.novasentis.com)

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