# Fitness and Tech:Creating the Ultimate Workout Gear

## An Competitive Analysis of Smart Fitness Technology for APEX Bodysuit

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# EXECUTIVE SUMMARY

Purpose

A competitive analysis of smart fitness technology products was conducted for the creation of *APEX Body Suit*, a smart clothing product used to help people wanted to get into to health&fitness and to help them get to their peak form of fitness and stay there. By analyzing the different products and their apps, the design and development teams would be able to get to find out what APEX could do to maximize a person's fitness and give their consumers the results they may not get from other devices. This analysis will hopeful ask questions such ask how should the app function, what should the suit be reading, what others do best and what are they missing.

Methods

3 smart fitness wearables for fitness and wellness purposes, known as Athos, Hexoskin and Fitbit smartwatch; These were analyzed under these 3 categories: what the apps offers, complexity and knowledge needed of the apps, and the overall visual design of the app and the device.

Findings
- All the devices give visual representation of fitness data
- All allow the user to customize their own workout routine
- Hexoskin and Fitbit focus more on heart rate, Athos also does this but it also is able to show what muscles are being activate
- Athos is targeted more to those that have vast knowledge in fitness and for athletes, Hexoskin and Fitbit target more for people in the athletic field but also for the average person
- Fitbit has available to the market longer than the other two devices, they also have a larger variety of devices;unlike hexoskin and Athos which only have a limited amount
- Hexoskin and Fitbit track a larger variety such as calories burned, sleep cycle, steps taken, distance travel and many more, Athos is mostly for what muscles are being activated and how much stress is being put on to certain muscles
- All use different technology to measure a person's activities: Athos uses EMG (Electromyography) which evaluates and records the electrical activity produced by skeletal muscles; Hexoskin uses ECG (Electrocardiography) which is the process of recording the electrical activity of the heart; Fitbit uses PurePulse Technology which uses light sensors to monitor blood flow through the user's wrist in order to calculate beats per minute
- Athos is only available for iOS, Hexoskin is available for iOS and android, and Fitbit is available for iOS, Android and Windows

- All but Athos used GPS tracking to track distance that a person has traveled
- Athos and Hexoskin website seem limiting in information, this could be because fitbit has a longer present in the market and have tested product numerous times
- All the apps use small icons that represent what the feature does ex: a heart with a zigzag line represents heart rate
- All have different color choices; Athos uses a lot of black with a orange and red, but for the muscles they uses various colors to display the stress it is under; Hexoskin uses a lot of shades of blue while the icons are different colors, Fitbit uses a large amount of different bright colors.
- All have a library of crafted workouts, can also customize your own
- None have the ability to read one's metabolism
- Fitbit has diets, but you have to subscribed to a monthly fee, Athos and Hexoskin do not
- Since fitbit is only on the wrist and not a body suit, it has given false results before, Athos comes with a top and bottom fits, Hexoskin only comes with a top
- Athos is the only one that is suppose to help with form by showing what muscles are being stressed and if you favor one side more than the other, but this would be observed by those who have vast knowledge in the fitness field, the average person would not know if the wrong muscle is being worked

Recommendations

After doing research on the products, these are the recommendations for APEX Bodysuit:

- Creating a product that can be used for a professional athlete and for the average person
- Needs to have log of different workouts and challenge of different ranking, also can customize their own, coach
- Have it available on iOS and Android
- Using different icons to symbolize different features such as diet, weightlifting, running, etc
- Use cool and neutral colors with light use of bright, so that it won't strain eyes and feel overwhelming and bright can be used to attract what they want to know
- Give an end result of workout/daily routine
- Has recommended diets depending on the person's metabolism and body type, and water intake, helps manage, gain or lose weight
- Use few words that help get straight to the point since app will provide a lot of information
- Able to read heart rate, calorie count, muscle use and resting time, breathing cadence/rate, body fat.
- Will work on products for fitness, then once having more exposure, can go for a loose fitting clothing to measure sleeping cycles.

- Has to be washable
- Bluetooth compatibility
- If doing an exercise wrong, lets the user know and helps to fix, if still doing it wrong then gives different workouts to do to give similar results
- GPS option so if they go on long distance run they can track their running routine

# METHODOLOGY

Over the years, there have been hundreds, maybe even thousands of different apps to help with one's fitness and weight loss. Also many wearable devices that are said to give an great improvement to workouts and give people an advance. APEX is meant to be fully wearable suit that would give people maximum results; after researching, it was found that there's not many smart fitness clothing since it is difficult to achieve perfect data results when it comes to fitness. Most of the time in order to measure a person's vital signs, they would have to be in a special facility with a lot of software and machines, but with technology nowadays it is possible to store supercomputer like software into small devices. The ones that have been shown to be working and give results were the Athos suit and the Hexoskin. Since there are not many fitness smart clothes, we used fitbit since it is very popular amongst consumers.

| Product | Athos | Hexoskin | Fitbit Smart watch |
|---|---|---|---|
| App Support | iOS | iOS/Android | iOS/Android/ Windows |
| Year or release | 2012 | 2013 | 2015 (first fitbit product was released in 2011) |
| Wearability | Clothing-top and bottom | Clothing-top only | watch |

Below is more information about the devices and the apps that come with them:

# Athos
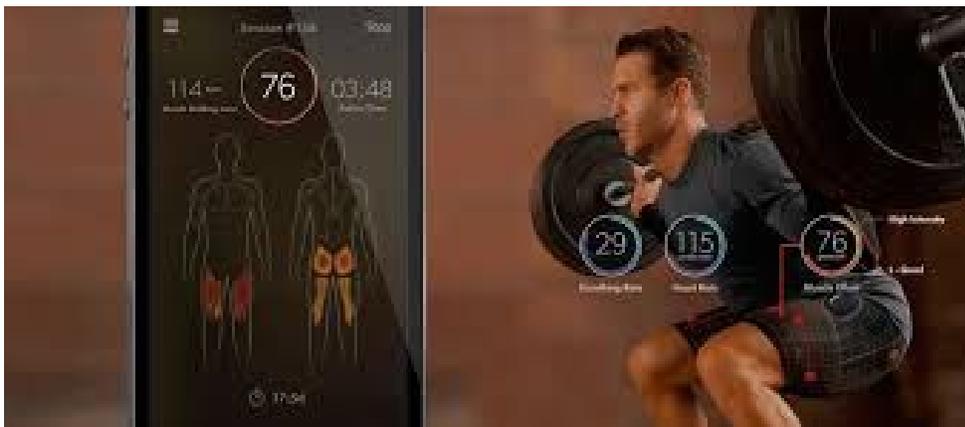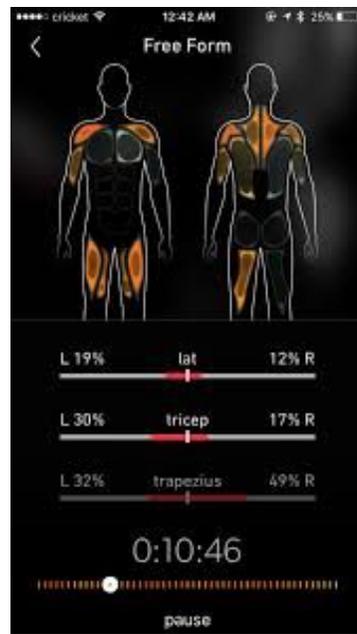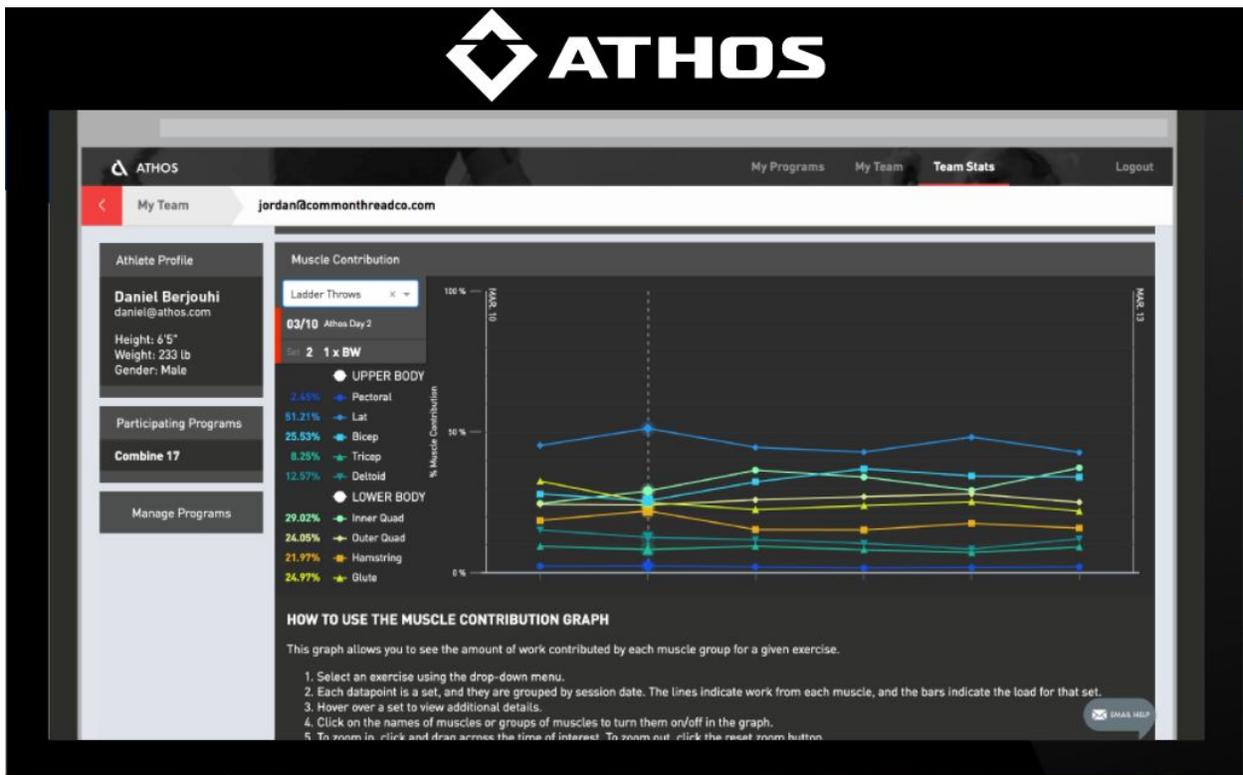
**Description on the app store:**

"Athos is developing a new class of products to help every athlete reach their optimal level of fitness. We offer performance apparel measuring quality and intensity of movement to deliver a tailored coaching experience based on individual goals and performance.

Named one of Fast Company's Most Innovative Companies of 2015 and one of Gear Patrol's 100 Greatest Products on Earth, Athos is revolutionizing performance technology."
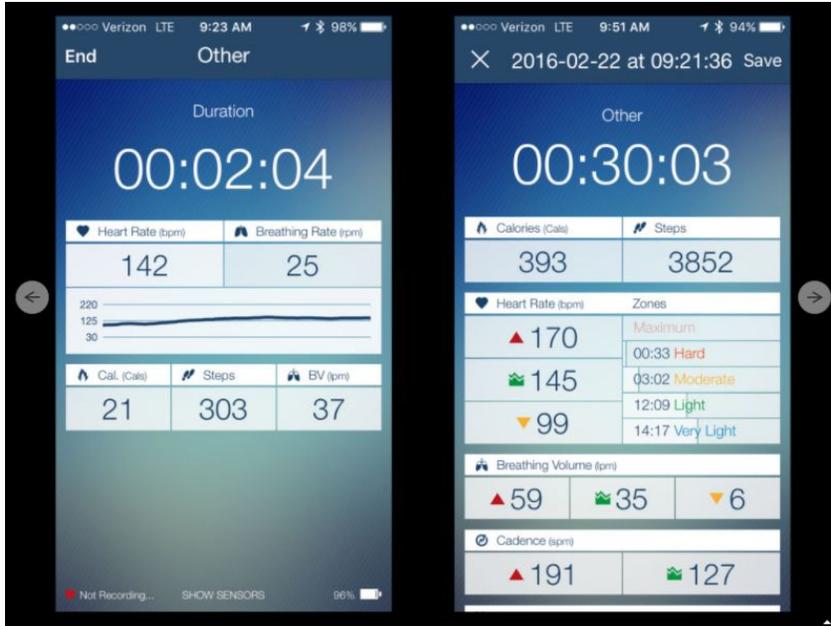
Website:https://www.liveathos.com/

# Hexoskin



Integrated Activity Sensor

Integrated Respiration Sensor

Integrated Heart Sensor



●●○○○ ROGERS   LTE   10:17      ⁕ 81 % ▭

✕          Sleep

| ⏰ Total Sleep Time (s) | ⚙ Sleep Efficiency |
|---|---|
| 07:55:40 | 96 |

| 🛌 Sleep Latency (s) | 💗 HRV (s) |
|---|---|
| 01:07:20 | 36 |

Sleep Stages

| | |
|---|---|
| | 01:25:00 Awake |
| | 02:15:40 REM |
| | 05:40:00 Non REM |

Sleep Position Changes

78

Heart Rate (bpm)



●●●○○ ROGERS 🏠 14:32      ⁕ 82% ▭    Done



●●●○○ ROGERS 🏠 14:31      ⁕ 82% ▭    Done



●●●○○ ROGERS 🏠 13:45      ⁕ 99% ▭

‹ Back    Instructions

Run as far as you can for 12 minutes.

Make sure to warm up for 5 minutes before you run.

•

Do test!

**Description on the app store:**

"Wear your Hexoskin shirt while you work out, sleep, or go about your daily activities. Whether you're training for your next triathlon or just want to check on your vitals during the day, Hexoskin will allow you to precisely monitor these important metrics:

- Heart rate
- Breathing rate
- Minute ventilation
- Cadence
- Steps, Pace, and Distance"

Website:https://www.hexoskin.com/

# Fitbit Smart Watch
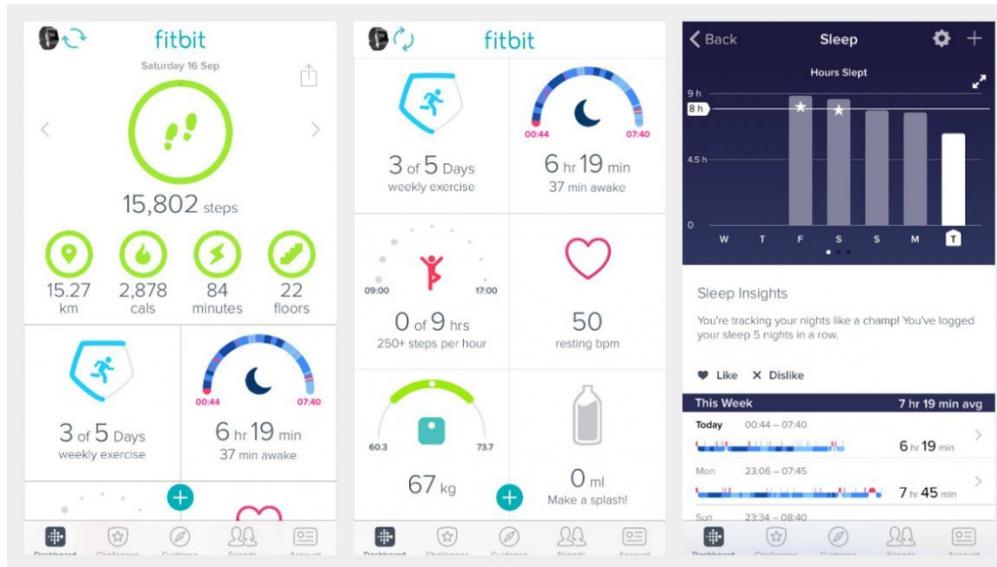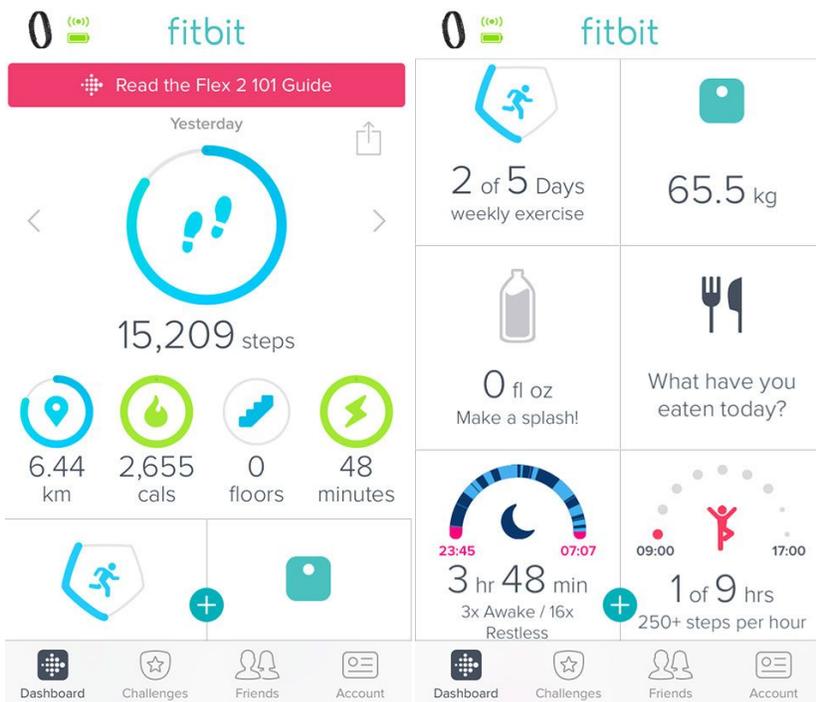
**Description on the app store:**

"Live a healthier, more active life with Fitbit, the world's leading app for tracking all-day activity, workouts, sleep and more. Use the app on its own to track basic activity and runs on your phone, or connect with one of Fitbit's many activity trackers and the Aria Wi-Fi Smart Scale to get a complete picture of your health—including steps, distance, calories burned, sleep, weight, and more"

Website:https://www.fitbit.com/home

# OBSERVATIONS

## What do the applications offer?

| What the App offers | Athos | Hexoskin | Fitbit Smart Watch |
|---|---|---|---|
| What does it have? | Showing what muscles are being used and heart rate, calendar to set works, counts set and reps, pre set workouts, customization of routine | Able to trace distance traveled, measure heart rate and cardiovascular activity, pre set workouts, measure sleep cycles,customization of routine | Tracks workouts,monitors workouts and progression,heart rate, has pre set workouts, measures hydration and calorie intake, measures sleep cycles,weight manage, customization of routine |
| How is the data traced back to app | Uses a small device called a core attached to garments, bluetooth | A small device in a pouch that plugs into shirt, bluetooth | Sync smart watch to your phone, blue tooth |
| What does it give back | Shows real time muscle activation on what muscles are firing, shows if you are balancing so you not favor one side over another, show how muscles contribute to movement | Shows how high your heart rate is, Breathing rate and volume to help control breathing, steps breathing cadence and calories burned throughout day, measures sleeping heart rate, breathing and positions | Heart rate, calories burned, calories intake, measure sleeping heart rate, and many more. If sync with WiFi smart scale can also track weight, BMI, lean mass and body fat percentage over time |

**Overview**

Even though the apps for these device have some similarities, they all differ in many ways. All three have to be connected by bluetooth via device, provide a log of workouts program in app with a customization option as well and all measure heart rate of the user. Hexoskin and fitbit show calories burn and can take your resting heart rate while sleep, and fitbit also has many other options that they show.

**Details**

Fitbit definitely had a lot more to give to a user when it came to fitness. It claims to measure heart rate, calories that are burned, how you sleep is, distance you run and so many other options that are available to the user by giving them a visual representation what they are putting their body through. For a person who is really into fitness and has the patience for putting all this data they can definitely see all the results. However with so much information it would take a new user sometime to get get used to getting around the app and they would also have to manually log in the food they eat, water they drink and their own customize workouts. This could cause some frustration especially for those who just want to get on the app and get started right away. However if taken the time and patience and learn it could be a great benefit.

Hexoskin may not have all of the food and water intake and other gadgets, but it does measure heart rate, calories burn, customization and pre set workouts. Since you have to wear a shirt with sensors, it can give a better reading since it is on you upper body rather than just your wrist like the fitbit. Hexoskin and the fitbit can be used for extreme workouts but also for just daily use. One can just either to just try to lift a healthier lifestyle and not have to be on the constant move. The fact they show results for sleep is a great plus because the body always need rest so it does not wear out and break down at a faster rate.

Athos is also shows heart rate but it is also give visual representation of the muscles being used. This is a great use for strength training so the user can see how much a muscle is being worked and is balanced. While Fitbit has a feature to show body fat and muscle with the help of a smart scale, the fact that one can get a visual representation of how much a muscle is working is a great help and to see the effort each is giving out can help with the form. It also can view the data on a mac computer that gives different charts and graphs on the muscles and workout performance. It can count rest time, so your body does not take to long a break between sets. It however does not give the amount of calories burn and seems to more focus on the weightlifting and form aspect, not so much on the cardiovascular representation. Hexoskin can show the lung capacity by showing how much stress your lungs are under in real time, on the iOS version, and Fitbit showing your heart rate and many other feature, showing that are more for weight management,

better sleeping, and for cardiovascular while athos would help with seeing form and making sure the right muscles are being worked. Also Athos is supposed to help with one's form while weightlifting, but if the user does not know what the correct form is, then they would not know to adjust themselves.

Athos is only available for iOS (Macs, iphones, Apple Tvs, anything apple of course) so it is only available to that market of users. Hexoskin has iOS and Android apps, though the visual real time lung visuals are only available on iOS at this time. Fitbit is available on iOS, Android and Windows so they hit all smartphone users. A reason for why some are available to all may be the time products have been available for market. If looked up on the app store, Athos has less than 50 ratings and Hexoskin has about 30 with android and iOS combined. For apple, neither have enough ratings to display summaries for consumers. For Hexoskin's android app, only 6 people given a summary for the app. This provides some difficulty to see how consumers feel since they seem to have so limited reviews, showing that hey are out there but are not known widely by the general public and that the company only has that one product out.

Fitbit on the other hand has thousands of reviews and comments for their apps on all platforms and they have been releasing products since 2011 and have been advertised to the public. This allows the company to get a lot more feedback from all sorts of different users.

**Insight**

For the APEX bodysuit, we wish to create a product that can provide all information with one app and one device. We want it to show everything that a person's body is going through, but in a very simplistic way. We also want it to be accessible to everyone, especially those that are completely new to fitness and want to get started. One thing that none of these do is measure metabolism. Knowing how one's body metabolism works would greatly help with managing weight because even if you put two people on the diet plan and exercise regimen, the results can vary. The suit should be able to give a visual representation of what their body is going through so they know what food can eat to get to the weight they want, how hydrated the have to be and also give different recipes and foods that can try and put within a calendar so they can track everything.

It would have a smaller detachable device that can sync to bluetooth and have it be rechargeable. The APEX Bodysuit would be more suitable for active activity and would be a tight fit clothing similar to Athos. Once we have this working well, can go for a loose fitting shirt similar to the Hexoskin so they can measure their sleep cycles however we can have the app suggest how much rest they should be getting. The shirt would also have to be washable.

# How complex is it? Can anyone use it?

| Complexity | Athos | Hexoskin | Fitbit Smart Watch |
|---|---|---|---|
| Audience | website seems to gear to athletes, strength coaches | advertising for both professional athletes and for the average person who works out on a regular basis | Health conscious individuals and athletic active people age:20-45 |
| Navigation | Navigation seems simple | Navigation could have more on screen, have to scroll a lot sometimes to see results | Looks very slick and easy, main menu has activities and can be clicked to see what you have done previously |
| How much shown on screen? | They have different modes that can be switched between, gets straight to the point when it comes to what one wants to know | There is quite a bit of information on the pages, but it's very blue and has slight color changes that pop out certain information | There is a lot of information but the way that it is display is not overwhelming, large enough to read in sections when clicking on different parts |
| Can anyone start using it? | Some knowledge of weight training would be needed or if a novice has a friend who knows | May take some time to navigate through, so the user would need some patience | Looks simple enough for anyone to use |

**Overview**

The apps' navigation is very different from each other. The audience for all of them are very similar because they aim for people that life an active lifestyle and that are into health wellness. Depending on what an individual is trying to accomplished, one of these apps should be able to help them accomplish their goals.

**Details**

When it comes to audience of each app, they all target those who are into fitness and health, however they all have slightly different targets. Searching through Athos' website, most of those who have used the product are athletes, professional and amatuer, and to reading through those stories all athletes had a trainer with them that go familiar with app and its features behind it. A really nice feature is the "Live Mode" which gives you real time representation on what muscles are being use and is shown on a image of a person with different colors representing that excretion. Another thing realized was that even though Athos is supposed to to help with form, it does not tell you exactly what the correct form is. It will tell you to put more effort on one side or comments that you should do for your next workout. For example, if a user was doing deadlift and not keeping their back straight then the app will give them the representation on the screen, but it will tell you "Hey, if you keep doing this you'll hurt yourself!". It makes more sense why on the website that there is another person with the athlete during the workout, as that person is probably a strength and conditioning coach or a trainer of some sort. Strength and conditioning coaches have vast knowledge in exercise and health also have to meet many different certifications before they can go coach. Personal trainers would also need to be certified and would also need to be a client list so people would not see them as a wannabe trainer but they know what they are doing. The display on the screen is not every overwhelming and is very straight to the point, although this may be because since its only use is for training weights and not for cardio, dieting etc.

The Hexoskin's app has a very slick design and it display a lot more information then that of Athos, however it uses different shades of cool blues. Blue is a cool soothing color that is very easy on the eyes and with Hexoskin's app displaying so much at once, any color that is a lot brighter would be harder to look at. However they do use different colors that pops out information. There are complaints about how users have to scroll through to see some of their results but it is not a deal breaker. Unlike Athos, it gives you a lot more when it comes to cardio, such as your VO2 max which is how much oxygen your body takes in while exercising. Those who can run for a long period of time have a high VO2 max and to have the hexoskin be able to show a visual representation is a great way for an athlete to get the most out of each workout. Though this is a great feat, it's only really good for conditioning and not for strength, it has a feature for working out but only tracking the calories burn and your heart rate during those workouts. It also has a GPS tracker that gives you a live update on your app so you can see the distance that your traveled. In a way the Hexoskin is the cardio version of the Athos, although they could use up more space on the app to display more information. If taken time to learn the software and all it has to offer, anyone can use it. I would be a great help to athletes especially those who are long distance runners.

Unlike Athos and Hexoskin, Fitbit has done many iterations on their app. Fitbit has been on the market since 2011 and have released multiple devices and the app has evolved over the years. The app is really nice,it has a white background mostly on the main page with each icon having their own color and some information on your daily activity. You can also rearrange, delete and add these different options from your main page. If you click on one of these section, it then brings up all the data of that section considering. For example, it has an icon that looks like a person running which t symbolized your daily activity, if clicked then what comes is the exercises you have done previously during the week. You can click on each one to see information such as distance traveled, calories burned, heart rate, etc. One hypothesis on why this app looks really nice is because it has been on the market for some time and has reach a very wide market. While all apps go through user testing, no one really knows what needs to be better untill it the world itself because developers will get feed back, good or bad, that may not have expected. Athos and Hexoskin are also available for purchase, but to purchase one you would need to go to their website and shop. Fitbit products are also available for purchase online but you can also go to retail stores to buy the devices. It may be some time before Athos and Hexoskin get to a wide market such as Fitbit, when looking on the apple's and google's app websites, Fitbit is the only one with customer reviews. The fact it has open market success proves that it is suitable for anyone who wants to track their fitness.

**Insights**

For Apex Bodysuit, of course we want it to be suitable for everyone. We want it to be used from Tom Brady the 5 time Super Bowl Champion to Jane who wants to get into fitness so she can fit into that little black dress in her closet. In order to do this this the app would have to meet both needs. It would need to have a simple looking design since there will be a lot of information that will be provided. We would use as minimum colors as possible so it does not overwhelm the users. We would probably go a route similar to fitbit with their home screen and they can click on different sections to get more information. We should play test and try to perfect our product as efficiently as possible, but once it gets on to market we would have to be diligent in fixing and improving our product as best as we can.

In some way, our product would be a combination of all the apps and their products with some slight additions and alterations. THe fitbit bit would be a good start of how we can paper prototype the designs, Athos and Hexoskin would help with how we can display the the muscles and their lung capacity during workouts.

# How pretty is it?

| Visual Design | Athos | Hexoskin | Fitbit SmartWatch |
|---|---|---|---|
| Data representation | Liew View: a 2D graphic of a person that shows how much the muscles are being used, the colors go from Blue(0%) to red(85%)<br><br>Set Summary: a circle with a line between it represents how balance your body is in between each set<br><br>Left and Right balance:a line that fills up left and right to represent how much effect each side is working<br><br>Muscle Contribution:A circle with different colors to show how much effort each muscle is putting in a exercise<br><br>Also has an app on the mac that gives a better representation with bar and line graphs | Real Time ECG: allows you to see your heart beat and you lungs taking in oxygen in real time with lungs changing color and a heart beat monitor<br><br>Real time Metric: a gps map to show where you have traveled, small icons below to show steps per min, beats per min, calories burned, etc<br><br>Run activity: icons and numbers show your maximum and minimum of your beats per min, average breathing, and cadence; each has a chart to show the changes throughout a workout<br><br>VO2 max,Resting and Maximum rate, Heart Rate recovery test estimation: Each is to test a certain attribute of your cardio. It will tell you do do a certain task, once complete a line chart  will how you did. Then the next screen will tell you your max, with a bar at the bottom that will fill up depending how you did | This application has many feature but they are all structure very similar all around.<br><br>Exercise: Shows with line and bar graphs on your daily workouts and has gps for distance traveled, uses icons for different things such bpm, calories, etc<br><br>Sleep: hows how long you have sleep for and how your resting heart rate was, gives a log of how you slept<br><br>Calendar:Shows has dot on days where you have been active on what days<br><br>Cardio Fitness: shows how your VO2 max is compared to other people with  a bar at the bottom with colors represent how poor to excellent they are to you |

| Colors | Black on the live view with colors going from blue-yellow-green-re to show muscle stress, mostly orange and black with white for the app, on the computer bars and lines range with yellow-green-blue to represent different muscles and their percentage of usages in workouts, balance bar goes from orange to red orange | Background and app in general uses multiple shade of blues. It does not feel overwhelming as a color and is soothing. For icons they use red, green, orange, purple and light blue and other colors to have them stand out. For line graphs they use red, and the progress report bars on the estimation pages go from red-yellow-green-light blue and they glow like lights | On main page the background is white but icons are represented in different colors for each section. Once clicked the page still has white for showing information but graphics match the color that was on the icon on the main page. Cardio Fitness has pink, purple,blue, turquoise, sea green and green to represent cardio fitness scale from poor to excellent |
|---|---|---|---|

**Overview**

All apps use different colors that work with what they do well. They all used white in some sort of degree and using the use of completely different colors for progress helps the results stand out so they don't blend into the page. Having different colored icons also helps so the user would not have to search through the page to find out what they want to know. Using graphs to show them their progress can also help motivate them to do better because they actually know what they are doing,  because as the saying goes "seeing is better than believing".

**Details**

Athos, Hexoskin and Fitbit all used very different color combination for their app's main colors, and used some some similar colors for results. Athos uses mostly black and shades of oranges with some white for their app. The black background helps the orange pop out to uses so that can see what exactly is going on. Using the different shades of oranges also helps seen when we see a reddish color we usually associated it with something that bad or overloaded. Using the yellows and greens is a good change up, it's something that helps with it because they can then associate the different colors with muscles, so when they see the blue the blue they would catch on to where that represents an upper body part. In the live view, having to show the muscle stress is a huge plus because now they would get to see exactly if they are being even enough with muscles and working out the right ones.

Unlike Athos who uses mostly black and oranges, Hexoskin uses multiple shades of blue. The large it's a darker blue and for some part it's a bit lighter, but not to light. This works well because blue is a very calming color. Even with the information being in white, the blues help it pop out and it does not feel overwhelming at all. Using red for the line on chart help it stand out drasticly and using different colors for icons helps those stand out as well. The glowing color bars is basically it say "hey, this is what you did look at me!" it would be the first thing that would probably catches the user's attention. Also using large fonts for number and certain sentences is also telling the user "Hey read me i'm important", whether that may be their heart rate or giving them instructions before completing a task.

Fitbit's was very aesthetically pleasing. It had a white background for most of the app but the icons and sections own a had their own color. The white background had the sections stand out and the fact that each had their own color made it very diverse. Having the colors for the level of of VO2max is nice as well, using different colors to represent poor through excellent is a good so user will eventually not read the world but soon learn what each color means.

**Insights**

The Apex Bodysuit would be similar to how ahos uses small amount of colors for their main colors but will look in using multiple colors and icons to separate from the main colors. These would allow users not feel like they are search all over the place for what results they want.

The live view and the real time ECG view would need to be on the same page some how to the user would not have to go back and forth to view them. One suggestion would be to have a view like the live view but also have lungs with in the human part. While the user is breathing, they could see how much they are breathing while their muscles are also at work. Using a light but calm blue for the lungs and have different color ranges for muscles. Once complete with their workout, they can then look at the results of both their strength training and their cardiovascular. These results in graph forms.

One thing that is also missing that would be a great asset is that if doing a exercise wrong, the suit will alert them with small vibrations. They would then look at their phone and be shown a video on what the correct form is, and would be told to try it out and practice it. If performing correctly for a certain amount of time or reps, they would be allowed to continue the routine. If still getting it wrong, it will bring up exercise that would be a lot safer so the user does not hurt themselves and also get some what the same benefit as the exercise they were performing wrong.

# RECOMMENDATIONS

- The main audience of this app would be for anyone wanting to get into fitness and who experts, would have to help with everyone. One suggestion would be to give the app different experience modes, like a video game
- The suit that would be created would need to read metabolism of user, it would be unique to each and would them lose or gain weight faster
- App would have to simple enough for all to understand but advanced enough to give them all they need. Using the right layout and colorations would help  so people do not feel overwhelmed by information
- Having icons and certain information stand out so the user does not have to feel as if they are searching all over for what they
- Body suit would have to combine ECG (Electrocardiography) and EMG (Electromyography) sensors so users can get effective strength training and cardiovascular endurance results
- Body suit would need a way to alert user when they are performing an exercise wrong, probably a slight vibration in area where potential injury can occur would be good, ould have to play test
- Having customization and pre set diets and workouts, so new user would have a workout and diet regime that allows them to start right way and so those who have knowledge in fitness can try something new or just doing their own thing
- Graphs are essentially for representation of progress, would have users stay on track and be motivated so they can reach their goals
- Allowing a social media aspect like fitbit could also be motivating so they can share with friends and have friendly competition that can gamify their experiences
- Need to make sure we do a lot of testing, also get it to open market. Having people testing is one thing but realising to the world would be a whole different beast
-  Split into different sections that can fit on main page, so user does not have to feel like it takes forever to get to what they want to get to
- Make it available for all smart phones once is perfected,should shoot for Andriod and i)S first because that is what most consumers use for smart phones
- Testers should be a mix of those who want to get into fitness to athletes, the more input from the different subjects the better so we can make it the ultimate experience for them
- Once fitness suit is completed and gets good enough feedback, can go for creating loose fit clothing to be used for sleeping and for rest days, so users can keep on track of sleep and make sure their body is well rested from their workouts

# APPENDIX

| Product | Athos | Hexoskin | Fitbit Smart watch |
|---|---|---|---|
| App Support | iOS | iOS/Android | iOS/Android/ Windows |
| Year or release | 2012 | 2013 | 2015 (first fitbit product was released in 2011) |
| Wearability | Clothing-top and bottom | Clothing-top only | watch |

| What the App offers | Athos | Hexoskin | Fitbit Smart Watch |
|---|---|---|---|
| What does it have? | Showing what muscles are being used and heart rate, calendar to set works, counts set and reps, pre set workouts, customization of routine | Able to trace distance traveled, measure heart rate and cardiovascular activity, pre set workouts, measure sleep cycles,customization of routine | Tracks workouts,monitors workouts and progression,heart rate, has pre set workouts, measures hydration and calorie intake, measures sleep cycles,weight manage, customization of routine |
| How is the data traced back to app | Uses a small device called a core attached to garments, bluetooth | A small device in a pouch that plugs into shirt, bluetooth | Sync smart watch to your phone, blue tooth |

| What does it give back | Shows real time muscle activation on what muscles are firing, shows if you are balancing so you not favor one side over another, show how muscles contribute to movement | Shows how high your heart rate is, Breathing rate and volume to help control breathing, steps breathing cadence and calories burned throughout day, measures sleeping heart rate, breathing and positions | Heart rate, calories burned, calories intake, measure sleeping heart rate, and many more. If sync with WiFi smart scale can also track weight, BMI, lean mass and body fat percentage over time |
|---|---|---|---|

| Complexity | Athos | Hexoskin | Fitbit Smart Watch |
|---|---|---|---|
| Audience | website seems to gear to athletes, strength coaches | advertising for both professional athletes and for the average person who works out on a regular basis | Health conscious individuals and athletic active people age:20-45 |
| Navigation | Navigation seems simple | Navigation could have more on screen, have to scroll a lot sometimes to see results | Looks very slick and easy, main menu has activities and can be clicked to see what you have done previously |
| How much shown on screen? | They have different modes that can be switched between, gets straight to the point when it comes to what one wants to know | There is quite a bit of information on the pages, but it's very blue and has slight color changes that pop out certain information | There is a lot of information but the way that it is display is not overwhelming, large enough to read in sections when clicking on different parts |

| Can anyone start using it? | Some knowledge of weight training would be needed or if a novice has a friend who knows | May take some time to navigate through, so the user would need some patience | Looks simple enough for anyone to use |
|---|---|---|---|

| Visual Design | Athos | Hexoskin | Fitbit SmartWatch |
|---|---|---|---|

| Data representation | Liew View: a 2D graphic of a person that shows how much the muscles are being used, the colors go from Blue(0%) to red(85%)<br><br>Set Summary: a circle with a line between it represents how balance your body is in between each set<br><br>Left and Right balance:a line that fills up left and right to represent how much effect each side is working<br><br>Muscle Contribution:A circle with different colors to show how much effort each muscle is putting in a exercise<br><br>Also has an app on the mac that gives a better representation with bar and line graphs | Real Time ECG: allows you to see your heart beat and you lungs taking in oxygen in real time with lungs changing color and a heart beat monitor<br><br>Real time Metric: a gps map to show where you have traveled, small icons below to show steps per min, beats per min, calories burned, etc<br><br>Run activity: icons and numbers show your maximum and minimum of your beats per min, average breathing, and cadence; each has a chart to show the changes throughout a workout<br><br>VO2 max,Resting and Maximum rate, Heart Rate recovery test estimation: Each is to test a certain attribute of your cardio. It will tell you do do a certain task, once complete a line chart will how you did. Then the next screen will tell you your max, with a bar at the bottom that will fill up depending how you did | This application has many feature but they are all structure very similar all around.<br><br>Exercise: Shows with line and bar graphs on your daily workouts and has gps for distance traveled, uses icons for different things such bpm, calories, etc<br><br>Sleep: hows how long you have sleep for and how your resting heart rate was, gives a log of how you slept<br><br>Calendar:Shows has dot on days where you have been active on what days<br><br>Cardio Fitness: shows how your VO2 max is compared to other people with a bar at the bottom with colors represent how poor to excellent they are to you |
|---|---|---|---|

| Colors | Black on the live view with colors going from blue-yellow-green-re to show muscle stress, mostly orange and black with white for the app, on the computer bars and lines range with yellow-green-blue to represent different muscles and their percentage of usages in workouts, balance bar goes from orange to red orange | Background and app in general uses multiple shade of blues. It does not feel overwhelming as a color and is soothing. For icons they use red, green, orange, purple and light blue and other colors to have them stand out. For line graphs they use red, and the progress report bars on the estimation pages go from red-yellow-green-light blue and they glow like lights | On main page the background is white but icons are represented in different colors for each section. Once clicked the page still has white for showing information but graphics match the color that was on the icon on the main page. Cardio Fitness has pink, purple,blue, turquoise, sea green and green to represent cardio fitness scale from poor to excellent |
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