PROJECT SHOES ABSORBER

SHOES ABSORBER is an electromechanical generator inserted in the shoes that uses the walking to *recharge the smartphone or a battery power bank and it could send send information about the parameter of the walking and the position with the GPS.*

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Product, Background / Challenge

Background:
In this moment there are only gadget in the market and an external GPS give only the position not information about the physical movement of foot and walking.

Challenge:	Result:
Demonstrate that it is possible use the small movements to produce electricity and check the position and movements of the user	New PRODUCT in the Wearable Devices, Remote Monitoring, Improved Physician Effectiveness.
Propose system low cost	Reduction of complexity for sample and New system of SELF - generation
Easy and fast installation	The Product could be installed in every SHOES
Low Environmental Impact	The solution does not use polluting materials. Completely recyclable
Reduction of CO2 emission	Tee system use new use of renewable source

Optional APPLICATIONS:

The smartphone with an APP (or a Wi – Fi card) furnish the position to remote control and all the information about the walking like time for step, time stop and with a simple analysis it could sees if in your walking there is an anomaly.

OPTION for Health and Sport

In the HEALTH field we offer a PRODUCT + SERVICE to the Person structured in **monitoring, data collection , control, processing**

The data of the physical movements of the walking such as SPEED, STRENGTH, TIMES allow the optimization and personalization of the rehabilitation / training programs for rehabilitation, the increase of physical efficiency and the maintenance of the condition with the possible reduction of recovery and with specific training to prevent or delay the onset of diseases.
Assistance is available at all times remotely based on physical responses to support re-education with alarm for anomalous data and geolocation with emergency intervention in case of alarm.
There is the reduction of CO2 emissions, the system uses the movement of the limbs for self-recharging, Quick and easy installation, the product can be installed in any shoes.

APPLICATIONS:

The smartphone with APP (or an optional Wi - Fi / Bluetooth card) provides information on limb movement: Speed, time per step, interval between steps, stop time and Geolocation (GPS).
This information is constantly stored and the Doctor analyzing it can see the performance trend in the time, SUGGEST THE RE-EDUCATION PROGRAM to reduce recovery times.

Product, Background / Challenge : Big data and Green Energy

Background:
In this moment there are only gadget in the market and an external GPS give only the position not information about the physical movement of foot and walking and the sensors measure only the force not the stroke of the movements.

Challenge:	Result:
COLLECT REAL DATA ON THE MOVEMENT OF THE LIMBS SUCH AS SPEED, STRENGTH, TIMES	New application for remote Collection, control, data processing.
Give feedback on large amounts of data to customize and optimize training / maintenance programs	Remote monitoring with data analysis and Improvement of physical efficiency, possible reduction of recovery times.
Demonstrate that it is possible use the small movements to produce electricity and check the position and movements of the user	New PRODUCT in the Wearable Devices, Remote Monitoring, Improved Physician Effectiveness.
Propose system low cost	Reduction of complexity of the SENSORISTICS and New system of SELF – generation
Easy and fast installation	The Product could be installed in every SHOES
Low Environmental Impact	The solution does not use polluting materials. Completely recyclable
Reduction of CO2 emission	The system uses in a new way renewable sources (the movement of the foot of the body) for self-feeding

APPLICATIONS:
The smartphone with an APP (or a Wi – Fi card) furnish the position to remote control and all the information about the walking like time for step, time stop and with a simple analysis it could sees if in your walking there is an anomaly.

SOLUTION

FUNCTION

During the walking the generator is pushed and it give electricity and a signal of the movement

It recharges directly the smartphone with the USB or a internal Power Bank

System that works

Shape for the assemby

We could operate in stroke, weight, dimension and cost,

With two shoes in one hour of walking there are about ten / fifteen minutes of phone call or two hours of Wi -Fi or four hours in Std – By, it is function of the weight and stroke of the system, we are working to optimize the performance.

PROTOTYPE, SAMPLE

Shape with Generator, output USB and Power Bank (battery and booster)

Vertical Section with Genaerator

COMPETITOR

ACTUAL SITUATION

In the shoes market there are only prototypes, one good idea is of the Vibram (Italy), it is an experimental system base d on a different technology with similar performance and there are some gadget of other inventors with lower performance (internet).

The information about your physical movement of arms and steps is possible only in the laboratory.

For Patent for this application after an analysis in WIPO (World data bank of patent) we haven' t direct competitors, the existing solution are system with GPS for the localization of the people but they don' t read the value of the movement and they aren' t selfcharged.

In the outdoor market there is the solar rucksack that charges the batteries.

	Energy mAh	Cost Euro	Pieces	Euro / Ah
Power Bank	2200	12	1	5.45
Solar Rucksack (differential)	2200	10	1	4.54
Charger emergency	2000	18 (High Quality)	1	9
Shoes Absorber	2* 2200	30	2	6.81

NOTE: it is to define!

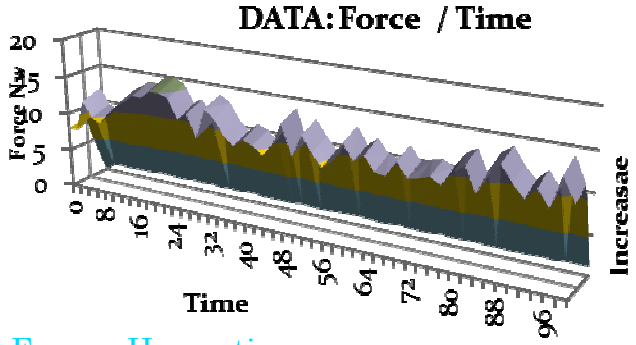
PRODUCT for Health and Sport

PROBLEM: I have a limitation in physical movement, temporary or permanent
BUT: BY MONITORING MY PERFORMANCE I CAN MAKE THE RE-EDUCATION IN MORE PERFORMING MANNER AND OPTIMIZE MY RECOVERY TIMES.
I have the doctor's control of the walking movement parameters
Recovery times are reduced
For my safety I can have information on my position.

How does it work ?
The foot makes pressure in the sole of the shoes.
The system generates electricity with an electrical output signal as a function of force and speed apply
The data goes to the Smartphone and from this to the Doctor's Server (CLOUD)

Result:
Information on:
The physical movements of the foot (legs), speed of the movements, time for step, the interval between steps, the stop time.
The position with GPS (Tracking)
THE TREND IN THE TIME OF MY PHYSICAL MOVEMENT PARAMETERS

HISTORICAL Biomedical Data:



Beyond Energy Harvesting

Actual Electric Performance and CO2 Reduction

Below there are the Description of the Results obtained for the application with the connection of a Smartphone, if we use a Wi-Fi card or an internal GPS the electrical performance increases
For Green Sustainability the table contains information on reduction of CO2 according to the production of electricity

Electric Performance

Function	Value
pressure Cycles / hour = Movements or pressure / hours	2700
Energy production in 1 hour mWh =	150
Energy consumption mWh / minutes in STD –BY = (Standard smartphone)	1.6
Energy consumption mWh / minutes in CALL (Standard smartphone)	12
Energy consumption mWh / minutes of WEB connection = (Standard smartphone)	12
Availability minutes in STD –BY = With 1 hour walk	93.75
Availability minutes in CALL With 1 hour walk	12.5
WEB connection minutes = With 1 hour walk	12.5

Table Reduction of CO2

Function	Value
Energy production in mWh for 1 user 1 hour	150
Hour / day of walking for 1 user	2.5
Energy production in mWh for 1 user 1 DAY	375
Number of day / year of use	365
Energy production in Wh for 1 user 1 YEAR	136.8
CO2 reduction in grams per 1 KWh	766.8
CO2 reduction in grams for 1 user in 1 YEAR	104.9
CO2 reduction in KILOgrams per 1000 users in 1 YEAR	104.9
CO2 reduction in KILOgrams per 10000 users in 1 YEAR	1049.5
CO2 reduction in KILOgrams for 50,000 users in 1 YEAR	5247.7

It is only an example in function of the weight, size, dimension, stroke

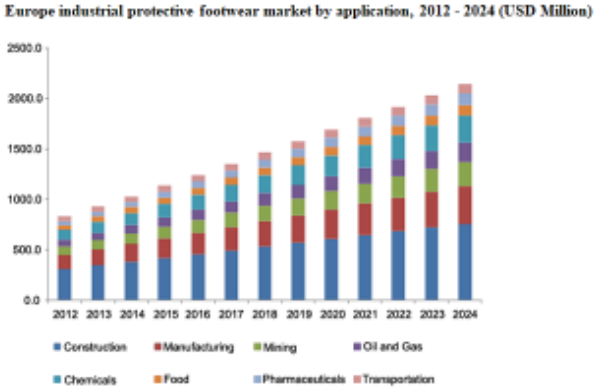
MARKET

The market is global, shoes for Sport/outdoor over 3 billions $; for training / rehabilitation over 1 billions $, for safety and tracking (GPS) over 0.5 billions $; in wearable to supply mobile device (young people) over 1 billions $.
We have the generator and we can only develop technical solution and offer after the PATENT a Licensing.
For the MARKET we need the assistance of big producer of shoes and a medical team, optimum is the assistance of a global operator of mobile and Sw service.

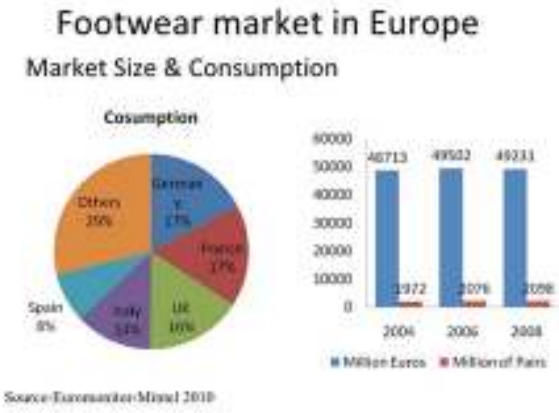
USERS
orthopedic doctor for rehabilitation
post trauma patient
family of disabled / elderly
social services / CEOD
Local Health
Social services department

For Gadget to recharge smartphone and wearable device:

European Market Values



European Market By Countries



2020 EU Market Projection = 1500 USD Million = 1326 Euro Million
Italy data on 2010 consumption basis about 10% of the total = 150 USD Million = 132.51 Million
Euro Exchange rate 1 USD = 0.88 Euro

TARGET / Competitor

TARGET

Our OBJECTIVE is to provide an aid with APP that provides the physical parameters of the movement in real time with geolocation which is recharged Out Grid from the movement.
From a remote location, the Doctor has real-time data on the user movement parameters in a dedicated file.
This information is constantly stored on the Server / Cloud and the Doctor analyzing it can also see the performance of physical performance in the time, optimize recovery times after a trauma with specific exercises and detect if there is an anomaly in walking.

As a cost analysis:

The cost for the user for the visit of orthopedist with physical tests in the testing laboratory starts from 130 Euros.
Added to this there is the loss of profit due to recovery and for potentially longer recovery times.
Here, remotely and automatically, there is the collection of data that also allow real-time feedback.

As a plus, a Power Bank is included in the aid, which has a market price of 12 Euros.

The price of a separate GPS is around 100 and needs memory (datalogger) and intelligence, in the smartphone with a simple APP we have all the things with low cost.

COMPETITOR

ACTUAL SITUATION
Since now there aren' t shoes that can supply sensors and smartphone, for this application after an analysis of the patents filed in the WIPO (World Patent Data Bank) we have no direct competitors.
There are a special shoes, but they need external battery and they can' t measure the stroke of the heel with his speed, it is a piezoelectric system but their dashboard is very well.
To analyze the value of the movements of the arms and steps such as times, speed and force, there is only the laboratory where the PC and the sensor are located, but only for internal analyzes.
The existing solution to track and locate users and Tracking are systems with GPS but they do not allow to obtain the values of the physical movement; these GPS have an internal battery subject to exhaustion here instead the energy for the power supply is provided by the movement but there is also an internal Power Bank for security.
A surrogate product can be the smartwatch or the smartphone but they always need external charging and they don' t give the real values of the walking parameters given by the foot.

BUSINESS MODEL

In the first moment we' ll start with a B2B, we' ll sell the system to producers of shoes

We provide systems that will be inserted in the shoes, there are three sector: sports, outdoor and sneakers and the sizes child woman men.

We use our expertise in Renewable energy and Energy Harvesting, the added value is the transformation of STANDARD COMPONENTS to obtain a product in terms of industrial cost and energy performance very competitive.

The price of 2 systems with power bank for 2 shoes will be about 30 euro and the industrial cost is about 22, the cost is about double of a standard Power Bank.

We' ll customize the product, the generator is special, battery and electronics are standard.

For us is possible also Licensing Revenue and Transfer of technology.

INTELLETTUAL PROPERTY

The intellectual property related to **Smart Shoes** is protected by trade secret

In addition, the company is in the process of drafting an international patent application for further protection of the Intellectual Property Rights. For this purpose the inventor has performed a patent search with PatLib Office from University of Trieste .The patent search resulted in the identification of thirteen patent documents that come close to the Company´s invention, since there exists prior art in the fields of electromagnetic devices and piezoelectric devices. However, there is room to overcome the existing prior art by claiming technical aspects of the company´s invention related to operations optimization, energy transformation efficiency, and environmental advantages.

FOR PANDEMIA AND COVID 19

It is a **Telemedicine service** that also allows **Remote Medical Examination** on pathologies, including those of a chronic nature, especially on Geriatric Patients that they are in this moment particularly fragile.

It protects both doctors and patients: distance and no physical contact.

It is a **Data analysis tool** aimed at both monitoring the conditions of physical fragility and continuous tracking with alerting that optimizes the management of impacts on the Health system.

It is a **Disease prognosis tracker**, a predictive system for the development and course of the disease / pathology with qualitative and quantitative data.

STATUS, TIMELINE AND MILESTONE

The TRL level - Technology Readiness Level is TRL 4 / 5.

Soon we' ll test in our home the final version for the field test.

The patent matrix is from the consultant, we hope to include other claims.

For 1° step we will deposit the patent in Italy .

For 2° step we will extend the patent for Europe (there is the support of Italian Fund for the extension) and some non-EU countries.

We must look for other customers in the global market.

We have other studies in progress for other applications