

Project Title: *Design & Development of high performance, multifunctional, protective sportswear for various sports*

Technology developed:

Developed Smart T-shirt for measurement of:

- Heart rate,
- Sweat &
- Skin temperature of wearer in real time

Novelty:

- Developed electronic T shirt is **first of its Own Kind in the world market.**
- It measures heart rate, Heart rate variability of the wearer in real time for long range data transmission without Internet data/GPRS.
- *No such commercially available product in National and International market.*



Comparison of commercial products vs WRA developed Smart T-shirt

Particulars	Commercial products such as;	WRA's Smart T-shirt
	• Hexoskin by Carré Technologies Inc.,Canada • OMsignal	
Product attributes	Measure heart rate, Breathing rate	Measure Heart rate, Heart rate Variability
Transmission range	Bluetooth (10-12 meters range)	RF transmission without internet/GPRS (upto 1000 meters)

price:	INR 40,000-45000 (including custom duty/ import charges)	Approximate price: INR 10,000
---------------	--	--

Specifications of developed product/process:

- Blend: Elastane /nylon (20%/80%)
- OMMC: Grade 4 (This is Fast Absorbing & quick drying fabric.) as per **AATCC 195**
- Clo value : 1.069 as per ASTM D1518
- Data transmission range: 1000 upto meters
- Module for data transmission: RF module

Importance of developed Smart T-shirt product:

The developed sports T-shirt is very useful to correlate health data of athletes/wearer in real time. E.g. fig 1 shows that athlete number 3 requires special attention after work out while fig 2 indicates that athlete number 2 can perform much better than other athletes. Therefore, data gathered from T-shirt can be useful to customize practice session of athlete as per his/her physical stamina in order to enhance performance of athlete.

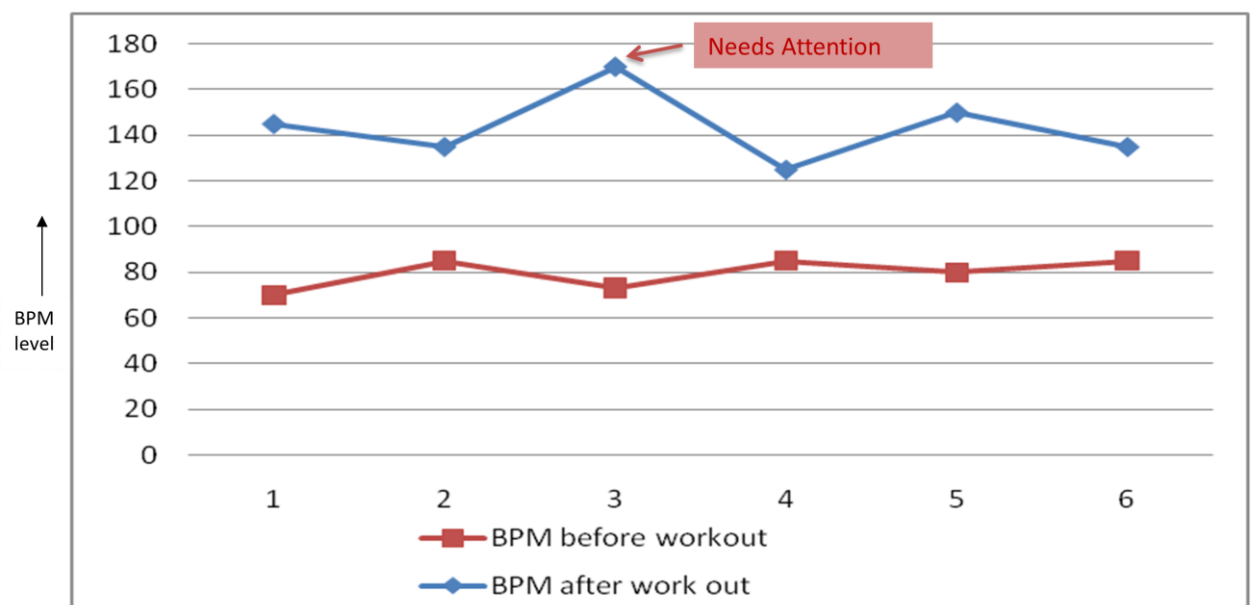


Fig.1 Correlation of Health data of Athletes participated

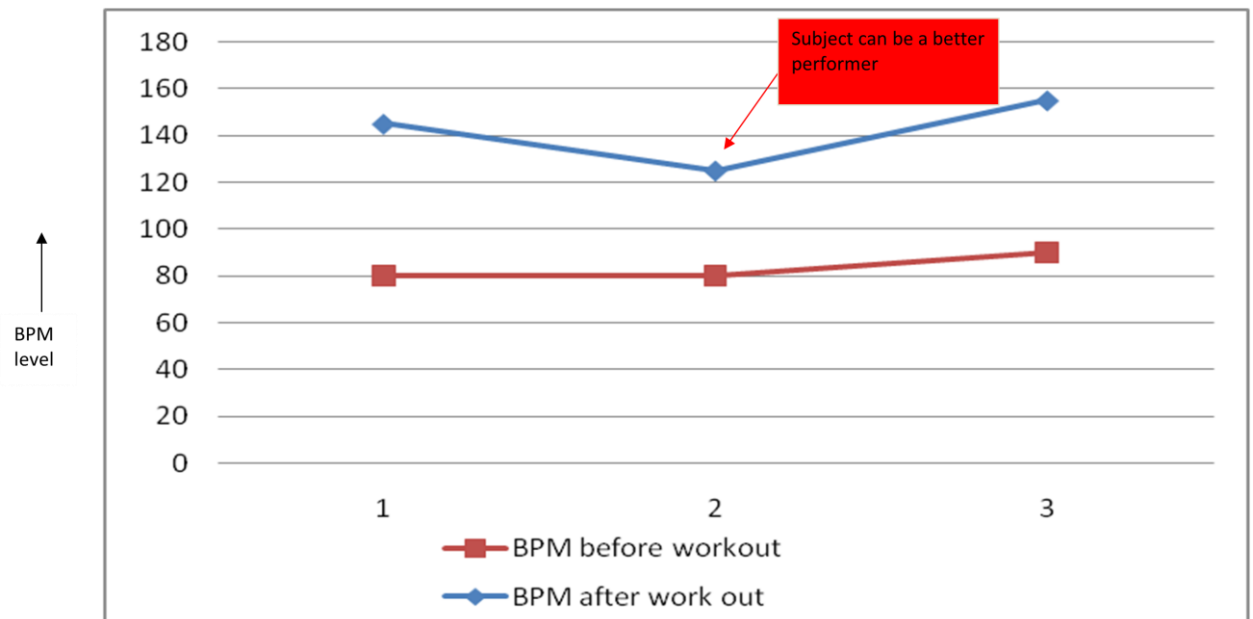


Fig2. Correlation of Health data of Athletes participated

Outcome:

- It measures heart rate, Heart rate variability of the wearer in real time for long range data transmission without Internet data/GPRS.

Special feature: International products are only available for short range monitoring through Bluetooth. WRA product is the only product in the world which monitors data at long range.

Publication:

1. Shishir Tyagi & Girish Kherdekar, Design and development of smart sportswear used for various sports, International journal of modern trends in Engineering and Research , Volume 04, Issue No. 11, 2017, page no. 95-100

• **Patent filed**

Patent on “Electronic wearable smart garment” **Indian Patent Application no: 201821027148**

Commercialization partner Industries

- Attiva India (Company of Abhay Group)
- Khanna Sports, Navi Mumbai
- Suryavanshi spinning Mills

Technology Transfer: In process.

Application

In sports: to enhance Performance of Sports athletes through customized practice sessions and monitoring of individuals during the match.

Medical Field: To check the health parameters of medical unfit and data can be directly assessed by Doctors in real time, **this will reduce loads on hospitals.**

Defense: to monitor health parameters of soldiers especially in border areas.

Senior citizens: To monitor their health by their family members and doctors.