

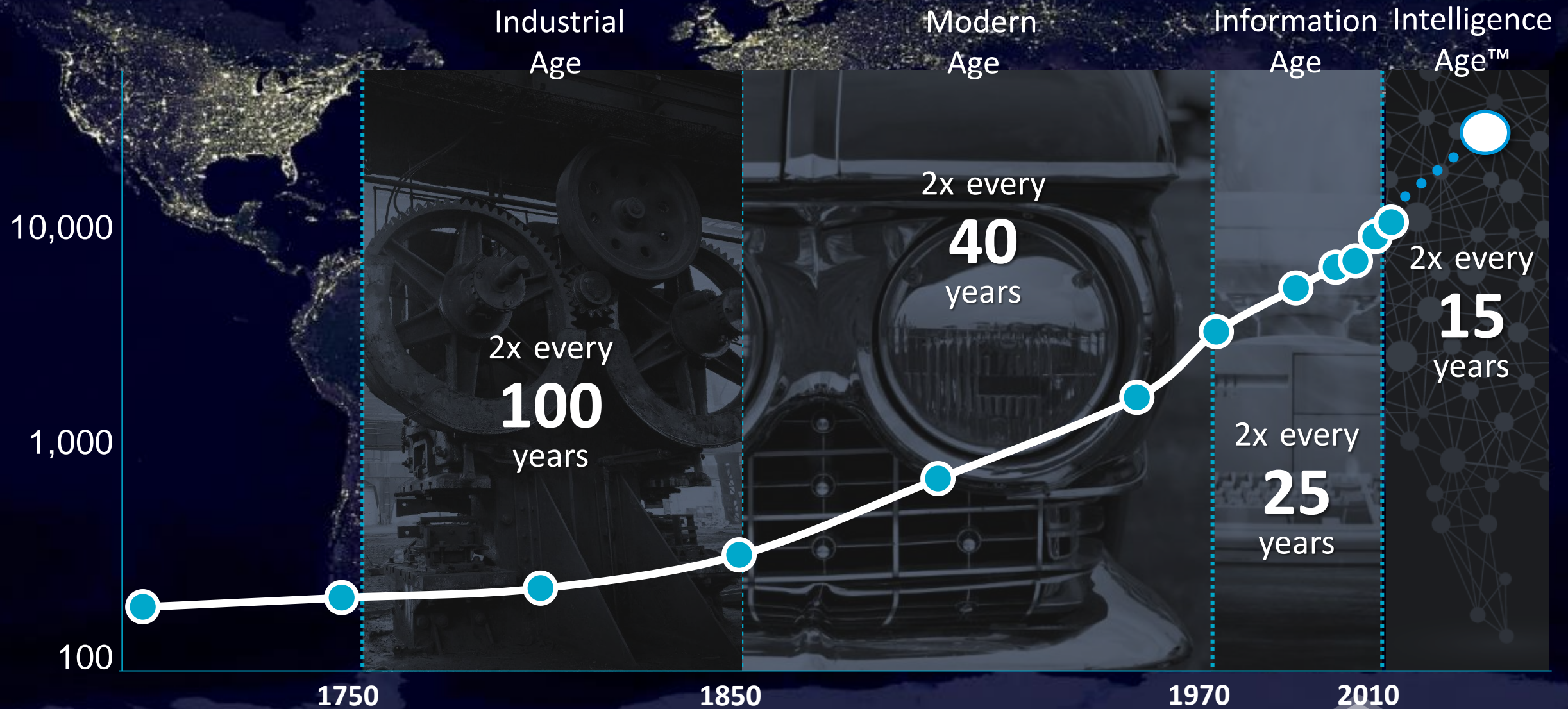
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FLEXIBLE INTERCONNECTS: Building Blocks & Lessons Learned for Wearable Tech

Peter Yu
July 9, 2019

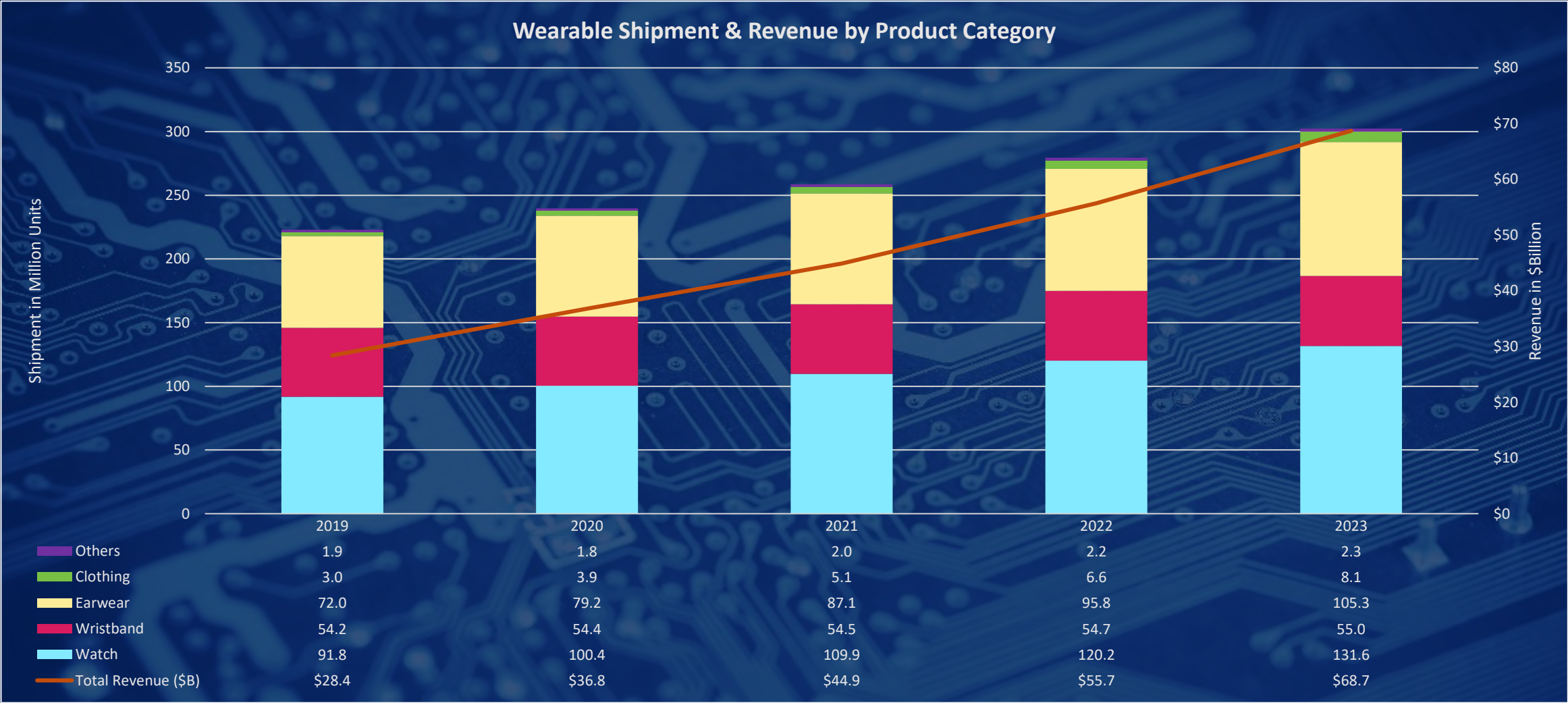
Average World GDP per Capita

(\$ USD)

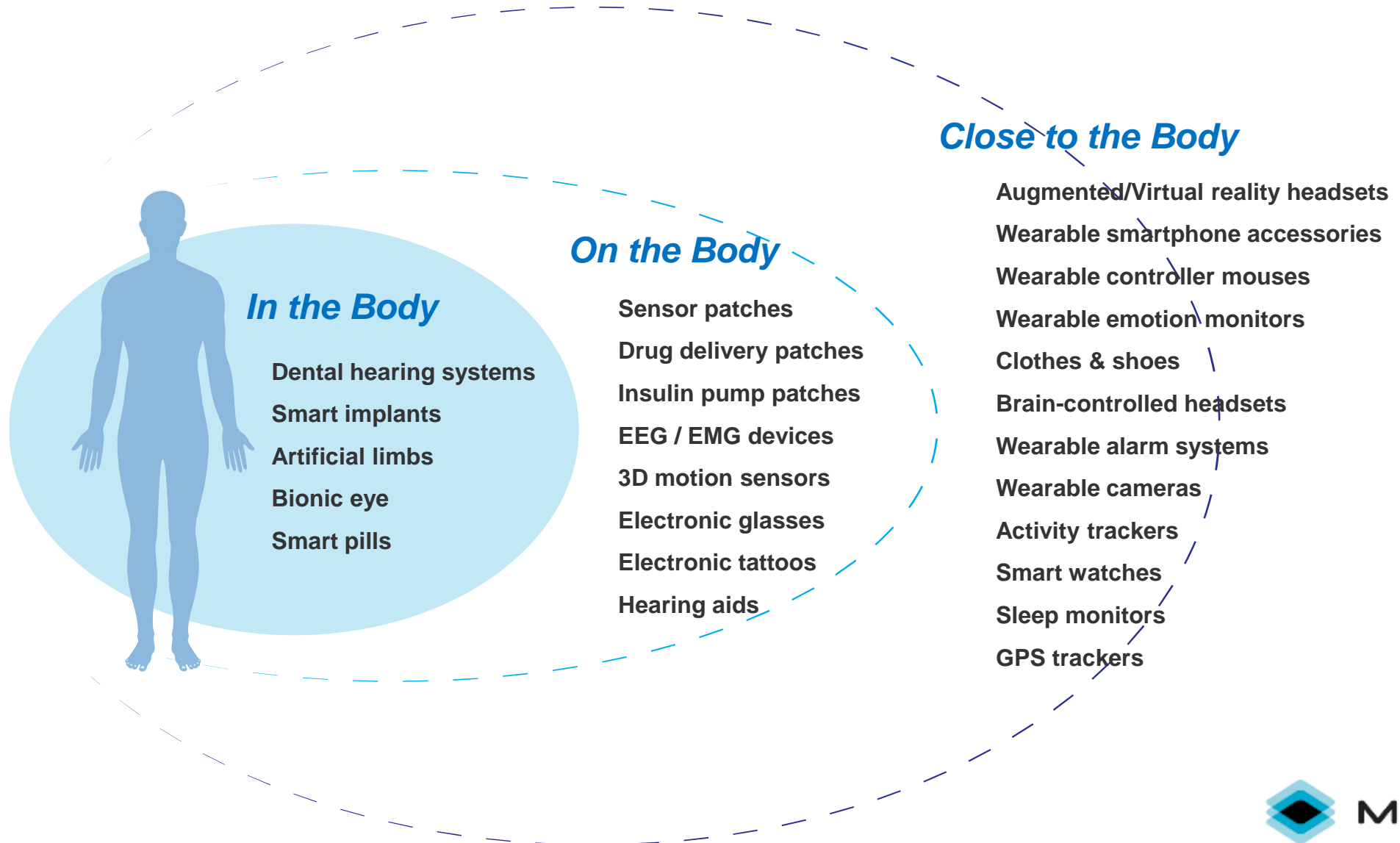


¹ Source: World Bank, Maddison Project, De Long- UC Berkeley ("Intelligence Age" TM by Flex)

Wearables Growth both a Cause and Effect



Defining Wearables based on Proximity



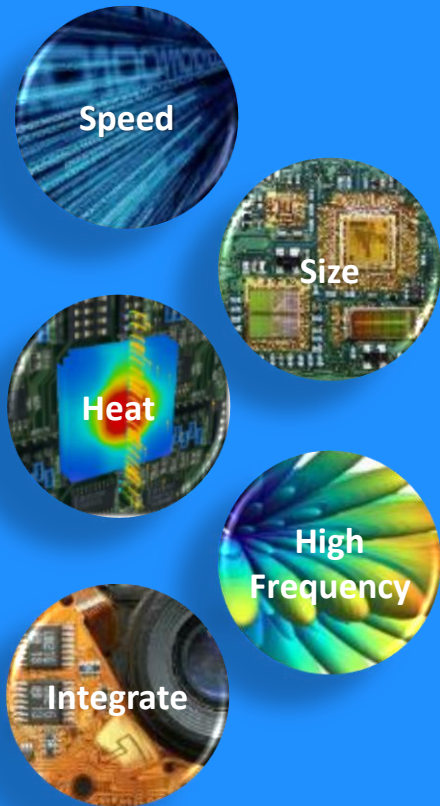
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Flexible Technologies



Industry Trends



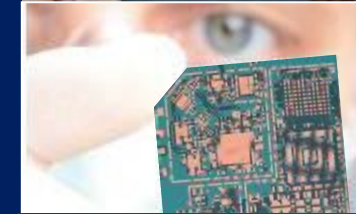
Technology Advancements

- *High Speed Interconnects*
- *Miniaturization*
- *Thermal Management*
- *RF Applications*
- *Modular*
- *Integration*

Solutions



Flexible Printed Circuit



Rigid Printed Circuit Board



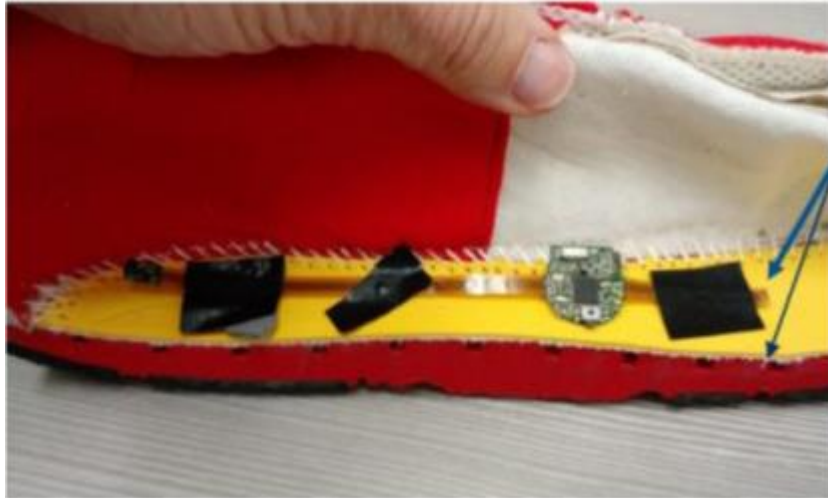
Rigid-Flex



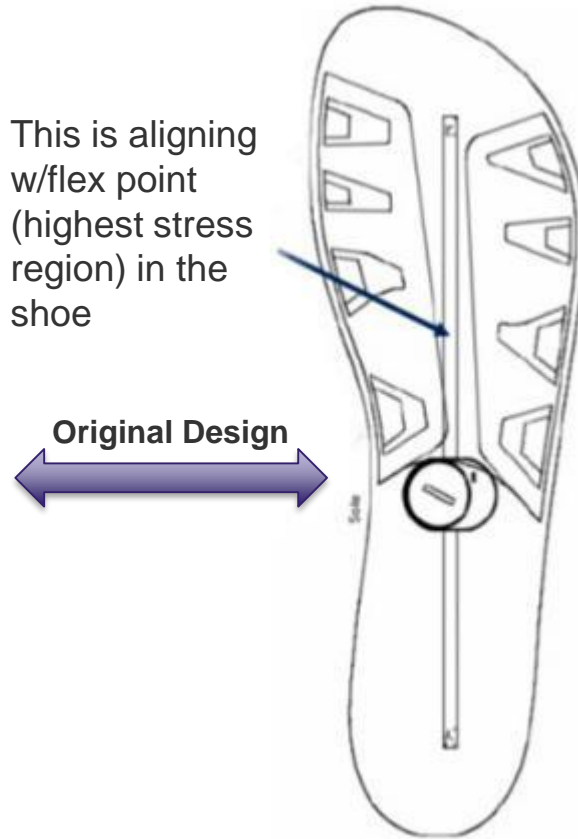
Flexible Printed Circuit Assembly

Wearable Tech – Initial Pain Points

Failed after ~10000 cycles (10 days for wear)*



This is aligning
w/flex point
(highest stress
region) in the
shoe



- Dropping
- Compression
- Twisting
- Flexing

***Electrical
failure***



Analysis of Competitor RFPC Fabrication

- Standard Rigid Flex
- ED Copper, Low elongation cover lay
- We were told it's small factory in China, but no logo

*Specification requires 1.0M cycles



Lessons Learned

CHALLENGES



- *Breakage*
- *Cost*
- *Human factors*



- *Breakage*
- *Coverage*
- *Software*



- *Use cases*

RECOMMENDATIONS



- *Flexible Printed Circuits*
- *Rigid PCB where possible*
- *Allergens warning*



- *Reliability Testing*
- *Rigid-Flex*
- *App not an afterthought*



- *Solve a problem*

Looking Ahead



RIGID-FLEX

01

02

RF POWER



5G

03

04

FLEXIBLE HYBRID
ELECTRONICS



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