



Ideas competition:  
*How do we build in 2050?*

THE WINNERS

# Who we are?

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***M. Idham Habibie***

University College London  
MSc Telecommunication  
Engineering

- Cobham Wireless Systems (2017)
- Ericsson Indonesia (2012-2016)
- Network Engineer
- Huawei (Internship)



***Quatrine Wahyuni***

University College London  
MSc Telecommunication  
with Business

- Telkom Infra (2014 - 2016)
- Radio Network Optimization Engineer
- Huawei Services (2012-2014)
- RF Engineer

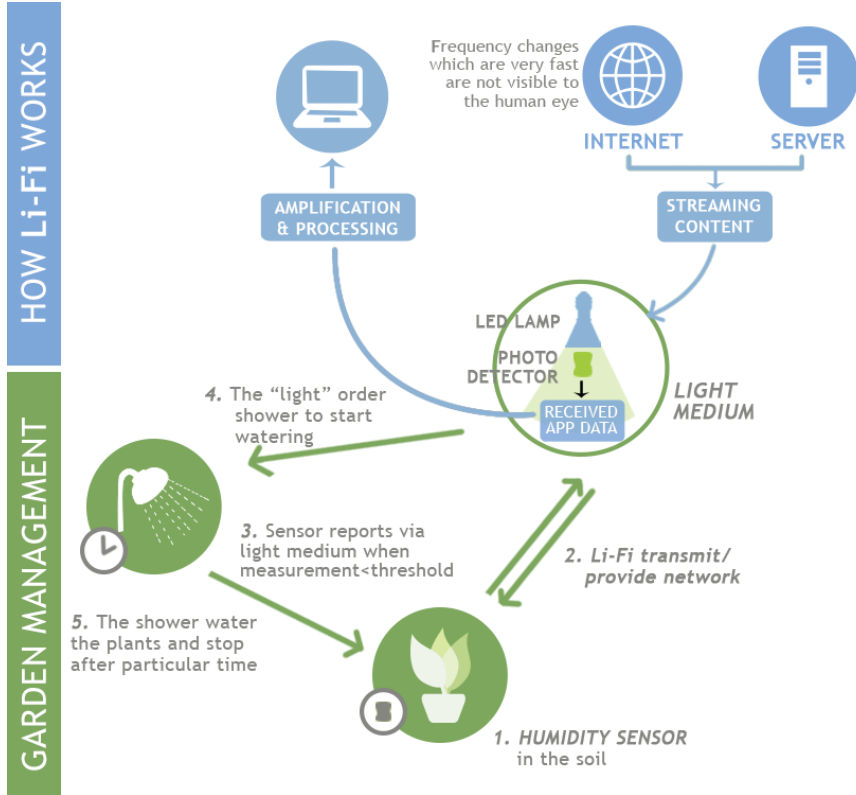


***Ixora Adisti***

University College London  
MSc Telecommunication  
with Business

- Telkom Indonesia (2011 -2016)
- Solution Engineer, Maintenance Engineer
- Telkomsel (internship)

# Our solution ... Light Fidelity (Li-Fi) for Eco Smart Building



**The Challenge** minimizing consequences of continuously growing population and number of buildings by reducing electrical power consumption reduction and development of new green spaces

## **Key Features**

- Smart eco buildings with features such as automatic light, security, 24/7 connectivity, sensors, and many more.
- Eco-friendly characteristic where we can do office farming, so that people can have green space near them and having the advantage by using the product from the farm.
- Li-Fi to accommodate smart building features, including office farming monitoring.
- Li-Fi gives both light and connectivity inside the building, reducing electrical power consumption and increasing efficiency in the building.

# Advantages of Our Solution



## Decreasing power consumption with Li-Fi

- Light and connectivity features combined
- Reducing the needs of router/access point for Wi-Fi



## Cost Efficiency Increased with Li-Fi

- Reduce the number of OPEX (power consumption cost)
- Power saving management with smart building features



## Smart Farming for Green Building

- Office farming generating green space inside the building
- Easier farming management (using sensors)
- Reduce the number of OPEX (resource cost)

## Additional benefits

### Healthier air for building occupants



### Faster internet connectivity



### Healthier food products



# Li-Fi technology still in early stages, but green building can be implemented already

## Biggest implementation barriers until now

- Li-Fi technology is still in research stage and has not been fully implemented yet.
- Li-Fi is using high frequency (THz frequency) makes it vulnerable to obstacle and gives low coverage distance (around 5-10 m). It also allows devices to work best under direct light.
- Li-Fi currently researched using LED, while plant grows also need other kinds of light, such as HEFL and fluorescent.
- Smart office farming needs many integrated devices (bulb, sensors, shower, etc.)



## Next steps to make it a reality

- 1 Further research of Li-Fi required, including another types of light being used
- 2 Smart eco/green building can be implemented from now, started by using empty space in the building to be turned into farming space (rooftop or windows).
- 3 5G mobile systems is needed to support the low power of integrated devices (LPWAN)