TECHINNOVATION
SINGAPORE 19 - 20 SEPT 2017
MARINA BAY SANDS

Technology Needs and Opportunities in Services & Digital Economy

1. **Artificial/Augmented Intelligence**
    a. Deep Learning
    b. Ambient Intelligence, Context-Aware Computing
    c. Computer Vision
    d. Natural Language Processing, Semantic Technologies
    e. Speech/Audio Analysis

2. **Big Data Analytics**
    a. Descriptive Analytics
    b. Predictive Analytics
    c. Prescriptive Analytics

3. **Immersive Digital Media**
    a. Augmented Reality
    b. Virtual Reality
    c. Content creation

4. **Cybersecurity**
    a. Threat intelligence and incident response
    b. Data protection and privacy
    c. Mobile security
    d. System and software security
    e. Cyber-physical/IoT security

5. **Other Industry-Specific ICT**
    a. Health IT
    b. FinTech
    c. Educational Technology
    d. Smart Factory / Industry 4.0

6. **Indoor Positioning Systems**
    a. Low-cost, easy to install indoor positioning systems
    b. Light-based, Ultrasonic, others
    c. Centimetre-range precision systems (e.g. UWB, etc.)

7. **Wireless & Communications Technologies**
    a. Long range, wide-area wireless network
    b. Low-power, wireless mesh network and applications

8. Sensors

a. Smell detector and odour identification
b. Health Sensors (e.g. EEG, ECG, Blood pressure, Blood Glucose, Stress level, Fatigue, attentiveness)
c. Biometric Sensors
d. Inspection and Surveillance Sensors
e. Low-cost thermal imaging sensor
f. Unified Sensor management system (firmware updates, battery management, etc.)
g. Environmental Sensors (e.g. Ambient temperature, relative humidity, PM2.5, PM10, CO2, etc.)

9. Intelligent Transportation Systems

a. Autonomous navigation systems
b. V2X or CV2X communications and applications (e.g. telematics)
c. Energy efficient transportation
d. Navigation sensors (e.g. Solid-state LIDAR, ultrasonic sensors)

10. Robotics & Automation

a. Service/inspection Robots
b. Anti-Drone system
c. Robot Navigation and motion control
d. E-commerce order picking
e. Robotics modules for Robot Operating System (ROS) or equivalent
f. Automated cooking machines (Roasting, Stir Frying, Frying for consistent colour, etc)
g. Automated packaging machines
h. Robotic assistive systems for kitchens
i. Food delivery systems for front of house use (e.g. waiting tables in a restaurant)
j. Food delivery systems for tenants within a building complex (multi storey buildings)

11. Electronics

a. Energy harvesting systems for wearables (e.g. TEG, Radio Frequencies, Kinetics, Ultrasound)
b. Wireless power transfer system
c. High energy-density rechargeable battery for wearables
d. Semiconductor packaging technologies (miniaturization)
e. Haptics feedback technologies (e.g. ultrasonic, force feedback)

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Technologies Needs and Opportunities in Advanced Manufacturing & Engineering

1. **Performance Materials**
    a. Transparent ceramics
    b. High Strength, high temperature resistant natural fibres
    c. High performance elastomers

2. **Functional Coatings**
    a. Long lasting and easily applied coatings for glass
    b. Organic-inorganic hybrid polymer coating
    c. Multi-functional coating
    d. Low cost acoustic dampening coating
    e. Environmentally-friendly anti-fouling coating for marine applications
    f. Low cost anti-corrosion coatings (non-sacrificial) for marine, and oil and gas
    g. Long lasting, low cost anti-fingerprint coatings
    h. Low temperature process ceramic coating

3. **Functional Plastics**
    a. Biocompatible plastics
    b. Biodegradable plastics

4. **Specialty Chemicals**
    a. Natural flavours
    b. Natural colourants
    c. Natural additives as substitutes in food
    d. Agrochemicals: crop care formulations

5. **Nanotech**
    a. Graphene technologies
    b. Nanomaterials & nanocomposites
    c. Hydrophobic and oleophobic nanoimprinting

6. Additive Manufacturing

a. Multi-material printing solution
b. Free form additive printing for industrial components
c. Hybrid Additive and Subtractive manufacturing for large components
d. Printed material qualification and characterisation
e. Metal powder/wire development and characterisation
f. Biocompatible polymers for additive manufacturing
g. 3D printed packaging solution for replacing PU foams
h. Printed material qualification and characterisation
i. Metal powder/wire development and characterisation
j. Biocompatible polymers for additive manufacturing

7. Industrial Automation

a. Predictive algorithms for prognostics
b. Industry 4.0 solution that can be retrofitted onto existing factory
c. Virtual Reality, Augment Reality, Simulation and Haptic Technology
d. Assistive devices for human operators (e.g. Exo suits)
e. Smart monitoring devices for plastic injection moulding processes

8. Robotics

a. Service robot solutions
b. Inspection drones (air/ land / sea)
c. Industrial robots for Marine & Offshore industry
d. Agriculture robots for planting and harvesting of crops

9. Functional Printing

a. Anti-counterfeiting solutions that can be printed using existing printing equipment
b. Printable ultra-low cost time temperature indicator
c. Low Cost Food quality indicator
d. Customisable indicator for detection of bacteria and viruses
e. Thin Film Flexible NFC
f. Smart Garment

10. Smart / Intelligent Packaging

a. Anti-bacteria packaging
b. Passive packaging to reduce amount of condensate within
c. Passive packaging to prolong ripening of fruits
d. Passive packaging to prolong shelf life of vegetables
e. Self-heating packaging for Ready Eat Meal
f. Active Packaging & Labels technologies to detect freshness and quality of products
g. Active Packaging for detection of harmful microbes in packaging
h. Ultra low cost inventory tracking solution for cold chain logistics
i. Biodegradable packaging for Ready Eat Meals
j. Packaging for Read Eat Meals
k. Anti-counterfeiting technologies

11. Machine Vision

a. 3D machine vision platforms that can be customised for different manufacturing environment
b. Inline non-contact solution for QA/QC of processed food
c. Vision systems for picking and sorting of items

12. Food Processing and Technologies

a. Food preservation systems using Microwaves, light technologies (UV, Pulsed, LED), non-thermal methods (HPP)
b. Automated cooking machines (Roasting, Stir Frying, Frying for consistent colour, etc)
c. Automated packing machines
d. Filling and packing of Ready Eat Meals
e. Robotic assistive systems for kitchens
f. Freezing and thawing technologies
g. Pesticide removal technology
h. Automated cutting technologies for ingredients
i. Asian noodle processing methods
j. Repurposing of Okara (Soya Bean waste)
k. Rapid Cooling Technologies
l. IOT solutions for monitoring manufacturing process

13. Food Services & Logistics

a. Food delivery systems for front of house use (e.g. waiting tables in a restaurant)
b. Food delivery systems for tenants within a building complex (multi storey buildings)
c. Track and tracing systems
d. Logistics system to reduce inventory

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Technology Needs and Opportunities in Health & Personal Care

1. **Diagnostic**
    a. POC Diagnostics
    b. Molecular & Genetic Diagnostics
    c. Non-Invasive Wellness Monitoring Technologies
    d. Biomarkers for Skin and Nutrition
    e. Rapid on-site detection for pathogens (biosensor or others)
    f. Porcine detection kit (consumer level)
    g. Rapid detection for food allergies
    h. Test Kits for used cooking oils (vision systems)

2. **Med Tech**
    a. Rehab Technologies
    b. Handicap Assistive Technologies
    c. Elderly Care Technologies
    d. 3D Bioprinting

3. **Health, Telemedicine & Big Data Analytics**
    a. Enabling Patient Empowerment
    b. Enabling Personalised Genomics

4. **Beauty**
    a. Skin Whitening Technologies
    b. Cosmeceutical Ingredients
    c. Transdermal Delivery Systems
    d. Patch Technologies
    e. Skincare Devices for Home
    f. Hair Growth/Dye Formulation
    g. Surfactants and Liquid Crystals

5. **Wellness (Non-therapeutic)**
    a. Women health, Feminine Hygiene, Hormone Replacement
    b. Anti-Stress Formulations
    c. Pain Sensors & Management Technologies
    d. Dermatological Formulation
    e. Olfactory & Fragrance Technologies

6. Food and Nutrition

a. Functional Food and Nutraceutical Ingredients
b. Weight Management
c. High Bioavailability Health Supplements
d. Energy Booster & Sport Nutrition
e. Pre & Probiotics Technologies
f. Medical Food Formulation
g. Fermented-Food Technologies
h. Ready Eat meal formulation
i. Low GI meals
j. Rapid Testing kit for personal nutrition

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Technology Needs and Opportunities in Urban Solutions & Sustainability

1. **Green Building – Renewable Energy System**
   a. Building integrated photovoltaics
   b. Micro wind turbines for urban environment

2. **Green Building – Energy Efficiency**
   a. Building materials / coatings to reduce thermal load
   b. Efficient air conditioning and mechanical ventilation technology
   c. Thermal energy storage for cooling application
   d. Energy efficient air purification & disinfection system
   e. Personalized cooling for building occupants

3. **Green Building – Sensors and Control**
   a. Low cost and self-powered sensors and sensor network
   b. Virtual sensors and intelligence for preventive maintenance of critical equipment
   c. Energy monitoring and disaggregation algorithm

4. **Green Building – Water Conservation & Recycling**
   a. Cooling tower water treatment
   b. Grey water treatment

5. **Thermal Power Generation**
   a. Carbon capture and storage
   b. Low-level waste heat recovery
   c. Ash utilization / repurposing

6. **Renewable Energy**
   a. PV cleaning
   b. PV power boosting
   c. PV optimization and control technologies
   d. Low cost energy storage system

7. **Water Resource Management – Industrial Wastewater Treatment**
   a. High strength COD industrial wastewater treatment
   b. Industrial wastewater sludge management
   c. Wastewater to resources technologies

8. **Water Resource Management – Environmental Monitoring**
   a. Low energy and long range water monitoring sensors
   b. Rapid, high sensitivity and high selectivity portable water borne pathogen monitoring
   c. Monitoring of surfaces or air for environmental control

9. Water Resource Management – Advanced Oxidation Processes

a. Low energy and low heat advanced oxidation system
b. Solar photocatalytic process
c. Integrated advanced oxidation processes
d. Low cost and off-grid water treatment systems

10. Air Quality Management

a. Odor control technology
b. Odor sensor technology
c. Exhaust air treatment

11. Solid Waste Management

a. Waste sorting technologies
b. Waste to resource
c. Waste to energy
d. Low cost and off-grid waste treatment systems