

REQUEST FOR INFORMATION

Overview:

The purpose of this Request for Information (RFI) is to provide the United Nations Development Programme (UNDP) with the latest knowledge of companies offering in the area of Internet of Things (IoT) with regards to elements; integration and solutions that can be utilized to support UNDP's operations and programmes around the globe (*refer to pg. 6 for UNDP's presence overview*).

UNDP anticipates following this RFI with an international bidding exercise for IoT elements, integration and solutions. The information provided in the RFI will be used to determine the feasibility, scope, timeframe and approximate resource requirements for such processes.

It should be noted that this RFI is not a request for commercial offer.

Background:

IoT is making the fabric of the world around us smarter and more responsive through incorporating the various digital and physical elements. As part of its corporate strategy, UNDP is committed to the use of smart technologies including IoT; renewable energy solutions etc. UNDP's commitment is also in support of the United Nations Sustainable Development Goals (SDGs) that call for sustainable future.

The use of IoT and related solutions can be implemented in building modern age facilities around the globe, something that is also supports the SDGs. Currently many UNDP/UN facilities have taken steps to attain above objective(s). UNDP is however keen to take full advantage of smart technologies including the use of:

1. Connectivity for IoT and M2M Applications: native hardware connectivity incl. options of LAN/Wi-Fi; GSM and Satellite (*i.e. fixed and mobile applications*)
2. Network/Hardware Platform: IoT Sensors; Gateways; Terminals and accessories etc.
3. Cloud-based Data Collection and Data Warehouse: real-time dashboards; status; base reporting etc.
4. Cloud-based Data Analytics and Business Intelligence: advanced analytics; reporting; customisation etc.

The use of smart technologies is aligned with UNDP's aspiration to "Create Smart UN Facilities" in all locations where UNDP serves. Digital technologies, driving the 4th industrial revolution, combined with smart and renewable energy technologies provide new opportunities and solutions for challenges, both, internal and external.

Digital technologies are changing our world (*and the way we work*). The availability of additional and faster internet connections, IoT, computing devices, cloud solutions, satellite data and imagery, advances in Machine Learning, Artificial Intelligence, and renewable energy technologies are making our environment unrecognizable from just a generation ago. These technologies among others, offer a new means of increasing UNDP's ability to address global challenges, with the potential of unlocking long term global sustainable development.

Against this background, UNDP is interested in exploring the applications of IoT hardware; connectivity and cloud-based data collection; analytics and business intelligence to support UNDP’s operations and programmes.

Scope of information to be provided

It is envisioned that the IoT elements and solutions proposed should address the requirements outlined below:

- 1. Connectivity for IoT and M2M Applications:** hardware native connectivity incl. options of LAN/Wi-Fi; GSM and Satellite *(i.e. fixed and mobile applications)*
- 2. Network/Hardware Platform:** IoT Sensors; Gateways; Terminals and accessories etc.
- 3. Cloud-based Data Collection and Data Warehouse:** real-time dashboards; status; base reporting etc.
- 4. Cloud-based Data Analytics and Business Intelligence:** advanced analytics; reporting; customisation etc.

Categories and Example Requirements:

- a. Hardware and Services/Functions** to collect; push and share data in following aspects *(i.e. monitoring; control; report etc.)*
- b. Sub-Categories:** vendors welcome to provide details of applicable sub-categories hardware incl. related services/functions.

Category	Description
Connectivity for IoT and M2M Applications	<ul style="list-style-type: none"> ▪ Applicable hardware for IoT and M2M Connectivity <i>(i.e. terminals; accessories etc.)</i> ▪ Support for data connectivity via native hardware connectivity including ethernet and/or Wi-Fi for fixed applications ▪ Native Hardware Connectivity including GSM; Satellite and/or Wi-Fi for mobile data connectivity applications and related elements ▪ Data connectivity for low bandwidth IoT applications incl. cost effective services and subscriptions ▪ Data Bundles/Airtime solutions inclusive of centralized management of SIMs; data bundles/solutions and terminals/dongles; etc. ▪ Global/regional/local connectivity options via partner networks and platforms <i>(Multi-Network: e.g. Native Connectivity + GSM and/or Satellite)</i>



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Network Platform	<ul style="list-style-type: none"> ▪ Sensors; Gateways; Terminals and accessories etc. ▪ Hardware own native connectivity incl. ethernet/Wi-Fi; GSM and satellite connectivity options ▪ Energy efficient hardware elements incl. robust network coverage and capacity ▪ Conformity to regulatory requirements; standards etc. ▪ Interoperability and compatibility of hardware offering with third-party software platforms in terms of collect; push or share/exchange of data etc. ▪ Network platform management: <ul style="list-style-type: none"> - Real-time monitoring and graphs - Securely Connect; monitor and manage network elements and devices (<i>e.g. upgrades, alarms, updates, inventory insights etc.</i>)
Indoor and Outdoor Environment	<ul style="list-style-type: none"> ▪ Indoor and outdoor lighting ▪ Temperature ▪ Humidity ▪ Proximity ▪ Gas: CO2; Oxygen; Methane; Carbon monoxide etc. ▪ Air quality and pollution ▪ Smoke ▪ Room occupancy ▪ Noise ▪ Intelligent climate control ▪ Thermostats ▪ Door/window/blinds: open/closed etc. ▪ Pressure ▪ Office equipment and appliances (<i>e.g. monitor and control</i>) ▪ Weather station: sunlight; rainfall; temperature; wind direction/speed etc. ▪ Soil sense: temperature, pH, moisture levels, and nutrients etc. ▪ Plant monitoring ▪ Sprinkler control: auto watering etc.
Security	<ul style="list-style-type: none"> ▪ Tamper sense ▪ Access control ▪ Smart locks ▪ Fire/smoke alarm ▪ Motion ▪ Perimeter monitoring
Waste Management	<ul style="list-style-type: none"> ▪ Trash and recycle collections <ul style="list-style-type: none"> - waste fill level - collection cycle etc.
Utilities (Water; Gas and Heating)	<ul style="list-style-type: none"> ▪ Quality ▪ Measurements ▪ Consumption ▪ Temperature ▪ Volume ▪ Heating



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Electric Energy	<ul style="list-style-type: none"> ▪ Power quality (<i>e.g. voltage, frequency, power factor, etc.</i>) ▪ Consumption meter; ▪ Fuel consumption meter for generators ▪ Appliances/equipment/lights control
Renewable Energy (<i>e.g. Solar PV</i>)	<ul style="list-style-type: none"> ▪ Overall system and individual components monitoring (<i>e.g. production; status; performance; etc.</i>) ▪ Irradiation ▪ Solar Panels: temperature; dust accumulation etc.
Transport and Logistics	<ul style="list-style-type: none"> ▪ Hardware for vehicle tracking (<i>i.e. terminal; accessories etc.</i>) ▪ Services and subscriptions: data bundles/airtime solutions inclusive of central management of SIMs; data usage etc. ▪ <u>Optional</u>: Vehicle tracking portal incl. dashboard; reporting etc. ▪ Parking space(s) occupancy sensor ▪ Example vehicle tracking data collected: <i>Location (GPS); current speed (GPS or Odometer); Current RPM; Dongle serial and VIN #; Odometer or Relative odometer; Temperatures (oil, coolant, catalyst, transmission); Fuel efficiency; Throttle and brake inputs; Battery voltage; Predictive maintenance; Emission etc.</i>
Asset Tracking	<ul style="list-style-type: none"> ▪ Location; condition; temperature, humidity ▪ Asset tag tracking: commodities; animals or livestock ▪ Solutions for SMART park initiatives incl. wildlife tracking; public park etc.
Data Collection (<i>incl. Base Reporting and Dashboard etc.</i>)	<ul style="list-style-type: none"> ▪ UNDP Global Presence: UNDP country; regional and programme offices ▪ Cloud-based data collection solution ▪ Quality data collection including validation; integrity; accuracy; consistency incl. support for data warehousing; consolidation etc. ▪ Data privacy and ownership by UNDP incl. secure data transmission across devices and platforms ▪ Realtime data visualization; dashboard; reporting incl. customization; trends discover and insights ▪ Securely connect; monitor and manage network elements and devices ▪ Interoperability technologies for collecting; structuring and unifying IoT data sources ▪ Indicate interoperability or compatibility of your offering with existing cloud-based platforms, for example, Microsoft IoT Hub; etc.



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Business Intelligence and Data Analytics

- Business Intelligence: Data analytics; advanced reporting incl. support for customization incl. redundancy; SLA etc.
- Cloud-based Business Intelligence and Data Analytics solution
- Cloud services/technologies that connect, monitor, and control numerous IoT elements
- Dashboard; oversight and reporting data accessibility (*e.g. sms; mobile/web apps etc.*)
- Trends discovery; optimization insights; lessons learnt; comparisons etc.
- Relevant application of technologies in IoT for quality data structuring; storage; analysis; statistics; machine learning; data mining; knowledge discovery and data/database management
- Cloud services/technologies that connect, monitor, and control numerous IoT assets.
- Data-driven decision making via application of machine learning and intelligence
- Interoperability technologies for collecting; structuring and unifying IoT data sources
- Indicate interoperability or compatibility of your offering with existing cloud-based platforms, for example, Microsoft IoT Hub; etc.

Responses to this RFI should ideally not exceed 30 pages and should include basic company information, technical datasheets/product/solution information, examples of relevant past experience and any other relevant information.

It should be noted that responses to this RFI, shall not be treated as proposals and shall not be used to short-list or pre-qualify bidders for any UNDP tender processes. Information provided may be used as input for subsequent tender processes (*i.e. timelines, technical specifications, etc.*). Respondents should clearly mark any proprietary information submitted in response to this RFI.

Upon receipt of responses to this RFI, UNDP may request vendors to demonstrate their products or solutions. Demonstrations will be intended to provide information to UNDP and will not be subject to an evaluation.

UNDP will not be responsible for any costs incurred by the vendors related to the response to this RFI.

The deadline for submission of information is the **13th April 2020**, however, as this is not a formal tender exercise, UNDP reserves the right to accept information provided after this date.

Information and queries should be sent via email to UNDP's Office of Information Management and Technology at the following address: IoT Initiative – IoT@undp.org



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UNDP Global Presence:

UNDP operates in the following **regions** and **countries** around the globe. It is expected that the related IoT Hardware and Services shall be used in these locations. Vendors are welcome to provide general information and insights that may be of value in UNDP consideration of this matter.

Region	Country
Africa	Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, CAR, Chad, Comoros, Congo (DRC), Rep of Congo, Cote D'Ivoire, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome, Senegal, Seychelles, Sierra Leone, South Africa, South Sudan, Swaziland, Togo, Uganda, Tanzania, Zambia, Zimbabwe
Arab States	Algeria, Bahrain, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Morocco, Programme of Assistance to the Palestinian People, Yemen, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, UAE
Asia and Pacific	Afghanistan, Bangladesh, Bhutan, Cambodia, China, Cook Islands, Dem Rep Korea, Fiji, India, Indonesia, Iran, Kiribati, Lao PDR, Malaysia, Maldives, Marshall Islands, Micronesia, Mongolia, Myanmar, Nauru, Nepal, Niue, Pakistan, PNG, Philippines, Samoa, Sri Lanka, Thailand, Timor-Leste, Viet Nam
Europe and CIS	Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Croatia, Cyprus, Georgia, Kazakhstan, Kosovo, Kyrgyzstan, Moldova, Montenegro, Romania, Russian Federation, Serbia, Tajikistan, The former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Ukraine, Uzbekistan
Latin America and Caribbean	Argentina, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, Venezuela