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The Internet of Things (IoT) market is increasingly being viewed as the next great development of the Internet. As part of its development, increasing attention is being given to connecting anything and everything that generates any data at all so it can then be used to create new value, quite possibly in a wide variety of new and different ways. In turn this has led to growing attention on very low data rate applications that have not been cost effective to connect before now. An important part of this has been the rapid introduction Low Power Wide Area (LPWA) technologies.

There are an increasing number of LPWA-type technologies, used in different ways, providing:

- Straight hardware connections
- Private network services
- Public network services

As a result of their rapid appearance, the diverse merits of these various underlying technologies have become a major subject for discussion in the market. This extends to new technologies such as LTE-M and NB-IoT, cellular variants due to enter the market in the near future.

We believe this growing debate is confusing to potential users, since it tends not to differentiate between these different ways of using the technologies. As a result the fact that some of these are used to provide public connectivity services and not straight hardware connections, which should therefore be judged on the basis of the service they offer rather than the technology they are based on, is not receiving sufficient attention. This is not helpful for the rapid market development being sought by the IoT industry.

These services serve a part of the market that has not yet been effectively served at all. Since it has not been cost effective to date to handle very small amounts of data, this part of the market has remained completely undeveloped. However, if the IoT is to fulfil its promise, ways to connect these very small amounts of data cost effectively must be made available in the market in a way that will last for a long time. This does not just mean long battery life. It also means the technology itself must be around for a long time. Some argue that this should be in licensed spectrum. Others believe the most cost effective route is to use unlicensed spectrum. It is not the purpose of this report to say which is best – it is time for the market to decide this. But for users to decide this, they need to be able to understand what is being offered in a way that relates the applications they want to use.

This report therefore sets out to propose definitions of new service attributes in terms that focus on what the services offer to the user, such as battery life and coverage, rather than on strictly technology attributes such as the frequency band being used. This is on the basis that most users are not at all interested in and do not wish to know the technical detail – they just want something that demonstrably works for them. The aim of doing this is then to ensure that these service attributes can be easily correlated with the needs of the specific applications that users are looking for.

At the same time as proposing these new service attributes, this report proposes a new name to refer to this new class of providers. Through discussion with key market players offering LPWA-based public services, it is proposed that the term **Public LPWA Services Provider (LSP)** be used for a provider offering LPWA-based connectivity services directly to users. In addition, where services offered by these LSPs are themselves enabled through a Cloud-based service, it is proposed that the term **LPWA Services Enabler (LSE)** be used for the Cloud-based services provider.

# INTRODUCING SERVICE ATTRIBUTES FOR LPWA APPLICATIONS

In order to develop an effective range of service attributes for public LPWA services, we took the approach of standing in the shoes of a prospective customer and making an informed assessment of their needs. We then checked this with current LSPs operating in the market.

The report describes the Service Attributes we believe enterprise users will be looking for from LSPs in order to enable the applications they wish to implement.

These are presented in three sections:

1. Attributes deemed essential to be defined for the application, which are applicable to all applications.
2. Attributes considered to be application-specific or enhanced features of the service which underpin the suitability of the service for a particular application
3. A list of service 'wraps' which may be offered, such as Service Level Agreements (SLAs).

Essential Attributes are as follows, in no particular order:

- **Battery Life**
- **Transmit mode**
- **Message delivery**
- **Latency**
- **Scalability**
- **Data Rate**
- **Geographic Coverage**
- **Security**
- **Device Cost**

In practice, many of these have a bearing on the first and the last of these – battery life and device cost. Geographic coverage required is then a principle factor. What users need to decide is the right compromise for them to achieve the cheapest and lowest power consuming connectivity service, for the coverage required.

Application Specific Attributes are then as follows, also in no particular order:

- **In Building Coverage**
- **Roaming/Ubiquitous Connectivity**
- **Geolocation**

A chart showing an LPWA Application Layer as part of the IoT World of Connected Services is also available for free download.

The full report provides more details of:

- Service attributes for LPWA services
- An analysis of LPWA application requirements

- An outline of the market opportunity for LPWA applications, including descriptions of over 60 applications already being used or planned in the market

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Beecham Research Limited (BRL) is a leading technology market research, analysis and consulting firm established in 1991. We have specialized in the development of the rapidly-growing M2M (machine-to-machine) and Internet of Things market worldwide for well over a decade, since 2001. We are experts in M2M/IoT services and platforms and also in IoT solution security, where we have extensive technical knowledge. We are also the leading analysts in satellite M2M. In addition, we see Wearable Technology as a key part of bringing the individual closer to the Internet of Things and this is also a primary area of activity for us. Additionally, we run analysis and research on the impact of M2M and the IoT on various sectors and industries. Since 2013, we have focused on agriculture and rural areas and the IoT can transform them. We have published a comprehensive study on smart farming and we have worked with key players in the smart farming ecosystem.

The management of BRL is well known and has provided consulting and research services for many of the leading telcos, suppliers, resellers, media and trade associations. We frequently participate in conferences and organize our own events with partners.

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