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March 21, 2017

Word ID – Intuitive representations of object identifiers

Gearoid Hynes
Hewlett Packard Enterprise

Gary Moloney
Hewlett Packard Enterprise

Chris Coughlan
Hewlett Packard Enterprise

Patrick Buckley
Hewlett Packard Enterprise

Gearoid Paul Donnelan
Hewlett Packard Enterprise

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Abstract: This disclosure describes a system and a method for mapping the numeric/alphanumeric identifiers of objects to words/phrases/sentences for the purpose of increasing memorability and/or human interactions.

This disclosure relates to the field of IoT and O2O interactions

As humans, we are all surrounded by physical and virtual objects that have an associated numeric, or alphanumeric, identifier. For the vast majority of the time we do not need to know what these identifiers are, let alone remember them, write them down or enter them into a form. However, with the growth of IoT the number of interactions we have with objects that have an ID, IP Address, Serial Code etc. is also increasing. Gartner estimate that there has been ~30% annual growth in the number of IoT devices, which will have a corresponding increase in the number of interactions between those devices and humans, along with a need for the humans to know/remember/enter the identifiers of the devices. The challenge with the numeric/alphanumeric identifiers is that they are cumbersome, unnatural and difficult for humans to remember. While some systems do allow the association of a name with an object, however these names are neither globally unique, and therefore cannot be commonly used to address the object in an open system, or cryptographically secure, meaning that they are easy to predict. This document describes a system and a method to create human intuitive identifier for objects which are globally unique and cryptographically secure. Such a system can be used to increase human interactions/engagement with the objects, speed up the process of providing/entering object ID information and reduce the number of errors.

Currently there is no common standard for humans to interact with objects, regardless of whether they are IoT devices or simply serialized products with a serial code. This means it is still difficult for people to move from the physical world to the online world (offline to online - O2O) when interacting with objects. O2O is important when:

- Brands wish to engage with customers
- Customers wish to get additional information about a product (e.g. traceability information)
- Interrogating an IoT device, e.g. get a chart of historical temperature readings
- Understand if a product is on recall

Technology solutions such as RFID, NFC and 2D Barcodes exist, however the average consumer is unlikely to use any of these options in order to interact with an object (such as a product they have purchased) either due to lack of support for a particular technology on their smartphone (e.g. NFC on iPhones) or due to lack of understanding of how to use it. 1% to 5% scan rates is the industry norm when it comes to consumers scanning 2D barcodes on products. As a result, most solutions resort to the lowest common denominator, which is the printing of a numeric/alphanumeric identifier onto the object. This then requires the consumer to go through the tedious process of entering the ID into a webpage or app.

These identifiers are unnatural, cumbersome, and difficult to remember and frequently result in errors when entering them on a phone/tablet/pc.

Word ID provides a globally unique, cryptographically secure word/phrase/sentence to represent the object. For examples a potential Word ID mapping for the GS1 GTIN Code "9521424416352" could be "dogs mash plow". This 3 word representation of GTIN Code is easier to remember, quicker to enter into a mobile device and offers opportunities to build marketing campaigns around the Word ID version. Word ID can be used to map traditional IDs onto random words (as shown in the previous example), names, phrases, quotes or lyrics, depending on the requirements.

Word ID builds on existing patents in the serialization area, namely US patent 9,110,895 "System and method for a serialized data service" and US patent 9,020,831 "Information tracking system and method".

The system consists of:
* A cryptographically secure random number generator (as described in US patent 9,110,895), the output of which can be assigned to products
* A system for the storage and querying of the codes
* Word ID module, which maps to & from the codes to the associated Word ID representation
* A database table containing the list of words/phrases/sentences which will be used in the Word ID mapping

The operation is as follows:
* An administrator decides what kind of Word ID mapping they wish to use (e.g. word, names, phrases), and if necessary provides a list of words/phrases etc. to be used for the mapping
* If insufficient words/phrases are provided for a 1:1 mapping for all potential codes, then a repetition factor is identified. This factor is the number of words/phrases that have to be used in order to ensure complete coverage. For example, if a provided list of words covers 1/3 of the code range, then a repetition factor of 3 is required and each code will be mapped to 3 words from the Word ID database table
* A batch of codes are generated.
* Each code is divided into X chunks, where X is the repetition factor
* Each chunk is mapped onto a word/phrase
* Chunks are then combined to create the Word ID representation for each code
* The Word ID is then printed on the product/IoT-device
* Customers then interact with the product/device by navigating to the appropriate URL and entering/speaking the Word ID

Disclosed by Gearoid Hynes, Gary Moloney, Chris Coughlan, Patrick Buckley and Gearoid Paul Donnelan, Hewlett Packard Enterprise