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UNIVERSAL PRODUCT ARTIFICIAL NEURAL NETWORK (UPANN)

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ABSTRACT

Products *(ex: product, part, component)* share common universal & transaction data and descriptive attributes. There are significant challenges to securely capture data, and to easily search / access the data throughout its lifecycle. It is also very difficult to find a universal method to describe a product and/or product attributes in a consistent and scalable manner. Utilizing blockchain technology, we will capture product attributes and corresponding data through a universal label and/or artificial barcode. Products will be scanned by users to collect data throughout a product's use and send data to the Cloud. Data can then be accessed and analyzed using advanced artificial neural networks (ANN) to organize, connect, and gain inference of the product itself. This innovation allows a scalable and consistent way to find usage and attributes for any product.

Still further, aspects of the presented techniques support the training of an artificial neural network (ANN) through machine learning (ML) to make the product and product attributes searchable and to provide recommendations and intelligent matches based on user inputs and questions regarding product attributes and details.

DETAILED DESCRIPTION

Utilizing blockchain technology, we will capture product attributes and corresponding data through a universal label and/or artificial barcode. Products will be scanned by users to collect data throughout a product's use and send data to the Cloud. Data can then be accessed and analyzed using machine learning and advanced neural networks to organize, connect, and gain inference of the product itself. This innovation allows a scalable and consistent way to find usage and attributes for any product.

As a manufacturer develops products, there is critical data to be captured at the beginning of the product's journey. For example, universal master product/item manufacturing details (manufacturer name, date created, key data attributes, part number,

description, where product was manufactured). For every product, a manufacturer initiates its blockchain token and associates it with a barcode on the product. All the attributes and the data will be added as a transaction to this token.

A product will continue its journey as it moves through the supply chain, such as: becoming assembled into other products, shipping/moving between sites. Every step of a product provides additional data (enrichment) and could be traced / scanned as it moves from one step to another. The data is tracked as transaction on the original blockchain. A product or part may be used or fitted by different users and each user updates the blockchain with their keys to describe their attributes and the data associated with it.

As the data is accumulated/collected/compiled throughout its supply chain journey, our system will:

1. Extract the data from the blockchain
2. Cleanse data
3. Train the artificial neural network using machine learning to accept the attributes from all of the blockchain. The ML system now can make intelligent recommendations back to users looking for product data of similar devices
4. Users will be able to ask questions and describe their use case to our system, which will be able to find the device a user may need (consumers looking for specific products with temperature tolerances, sizes, materials, manufacturing criteria)
5. ANN returns an intelligent match, can return additional recommendations if the search query is changed, and it can return the blockchain of the data history captured throughout its lifecycle, to justify the recommendation and boost confidence

Figure 1, below, illustrates the approach described above.

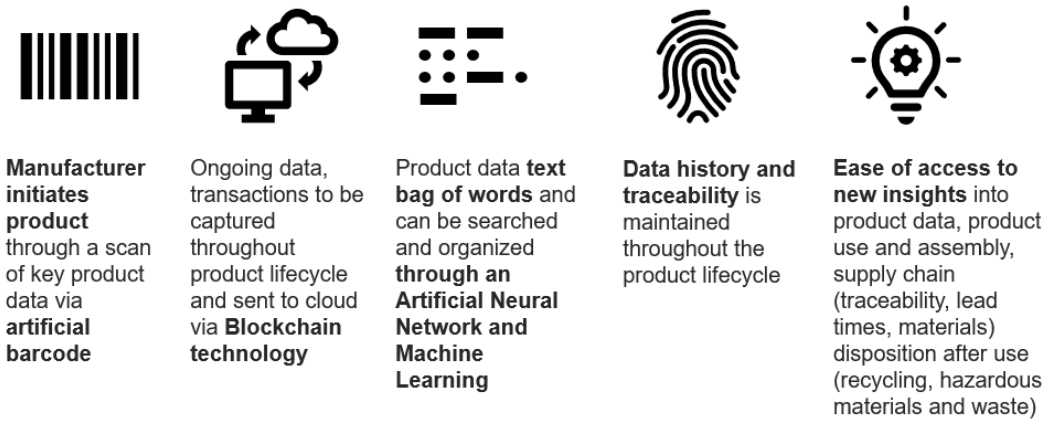

Figure 1: Illustrative Approach

Figure 2, below, depicts elements of an exemplary solution and architecture according to aspects of the techniques presented herein and reflective the narrative that was presented above.

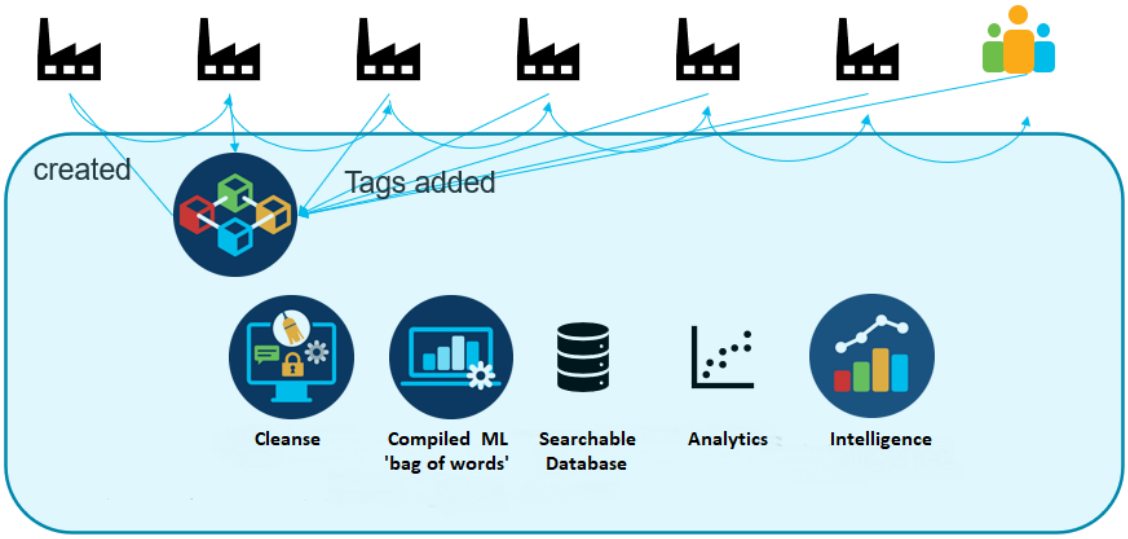

Figure 2: Exemplary Solution and Architecture

As illustrated in Figure 2, above, by employing aspects of the techniques presented herein data and attributes may be securely captured, from suppliers and manufacturers all the way to consumers, through a blockchain by means of an artificial barcode which is

created, updated, and secured in the cloud and from which a text 'bag of words' may be created in support of inquiry and analysis.

As described and illustrated in the narrative that was presented above, aspects of the techniques presented herein may support several use cases. A first use case may encompass the collection of universal product data. A second use case may encompass the capture of attributes using blockchain technology. A third use case may encompass the development of insights about a product through the comparison of different attributes, different users, etc. while training an ANN. A fourth use case may encompass the search of an ANN to match a requirement through the location of a product and/or product attributes.

In summary, techniques have been presented herein that support a Universal Product Artificial Neural Network (UPANN). Aspects of the presented techniques support the collection of data – using artificial tags (e.g., a universal label and/or an artificial barcode) and blockchain technology – throughout a product's lifecycle and the preservation of such data in a cloud. Further, aspects of the presented techniques support the enrichment of such data through, among other things, the capture of critical master and transaction supply chain detail (e.g., a product may be scanned by users to collect data throughout a product's use). Still further, aspects of the presented techniques support the training of an ANN through ML to make the product and product attributes searchable and to provide recommendations and intelligent matches based on user inputs and questions regarding product and how it is used. Use of the presented techniques yield several advantages including, for example, the consistent, efficient, and standardized capture of product and item data (across commodities in different industries) and a scalable and consistent means for finding usage and attribute information for any product.