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Counterfeit Response, Enhanced Detection, Intelligent Technology Support (CREDITS): A Microservice-Oriented Framework of Decision Support Systems to Detect Counterfeit Medical Supplies

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TREO Talk Paper

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Abstract

The scheme of counterfeit goods is a multi-billion dollar worldwide problem projected to trillions (Desjardins, May 20, 2019), highly detrimental to the economy (Hammadi et al., 2018). Counterfeit medical supplies threaten people's lives, national economy, and security. Because of the massive volume of packages across the borders, it is crucial to have reliable, efficient, and secure systems to detect counterfeit products. In this paper, we propose a microservice-oriented software framework to develop Counterfeit Response, Enhanced Detection, Intelligent Technology Support (CREDITS) for illegal medical supplies detection. This framework can be expanded to build a family of decision support systems for other medical supplies or products, saving time and resources for system implementation. CREDITS system allows easy extension to applications in the same domain, e.g., illegal drugs, counterfeit vaccines, and possible expansion to other product domains (e.g., counterfeit goods) with additional services.

To demonstrate the effectiveness of CREDITS, this study will customize it into a decision support system specifically on personal protective equipment inspection. The proposed system can be applied independently or jointly with existing systems. System built on this framework could enhance custom's capability to quickly detect counterfeit medical supplies while reducing workload and accidental damage cost from product inspection. This self-contained decision support system (CDSS) with build-out of microservices (function and products specific modules) is flexible and extensible, it can accommodate new functions, products, and regulation changes with pluggable components, ready to be incorporated with current CBP/DHS system. To make the system easy to use, a user interface will be developed to customize the criteria of detecting illegal medical supplies for stakeholders such as U.S. Customs and Border Protection (CDP), Department of Homeland Security (DHS), US Food and Drug Administration, and procurement divisions of local health department etc.

References

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