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Addressing the Existing Supply Chain Challenges under the COVID-19 Pandemic via the “Factory-in-a-Box” Concept

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Acknowledgement



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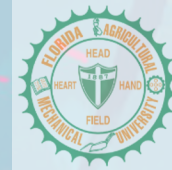
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- Researchers
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Introduction



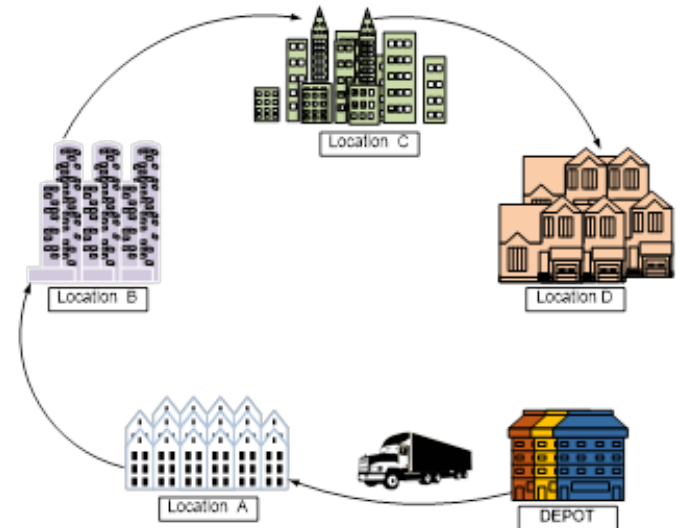
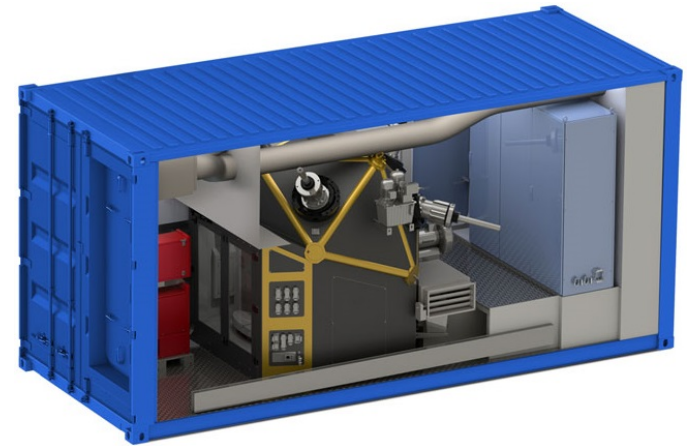
- Nowadays, different supply chains face various challenges that have been imposed by the COVID-19 pandemic.
- An emerging concept, which can be adopted by supply chain stakeholders to address the change and uncertainty associated with customer demand and other challenges imposed by the COVID-19 pandemic, is “factory-in-a-box”.

Concept Overview



“Factory-in-a-Box”

- Production modules or factories are installed in containers.
- The containers are transported using vehicles.
- The vehicles are deployed to the area, where there is a high demand for certain products for a period, during which the desired products are manufactured.
- The vehicles may travel to a new location afterwards in order to satisfy the demand for commodities.



Example Applications

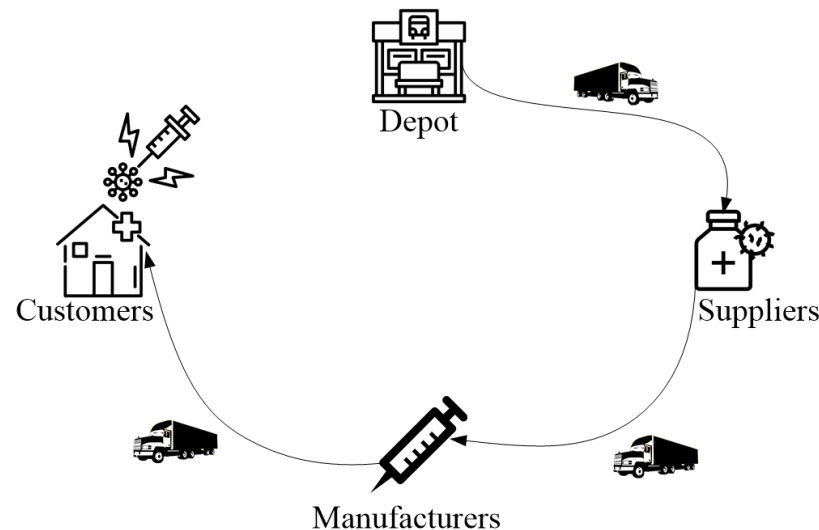


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Vaccination Project with a “Factory-in-a-Box”

- Raw products (i.e., medical liquids) are picked up from suppliers.
- Semi-finished products (i.e., syringes) are picked up from manufacturers.
- The final products (i.e., vaccines) are assembled directly at customer locations.

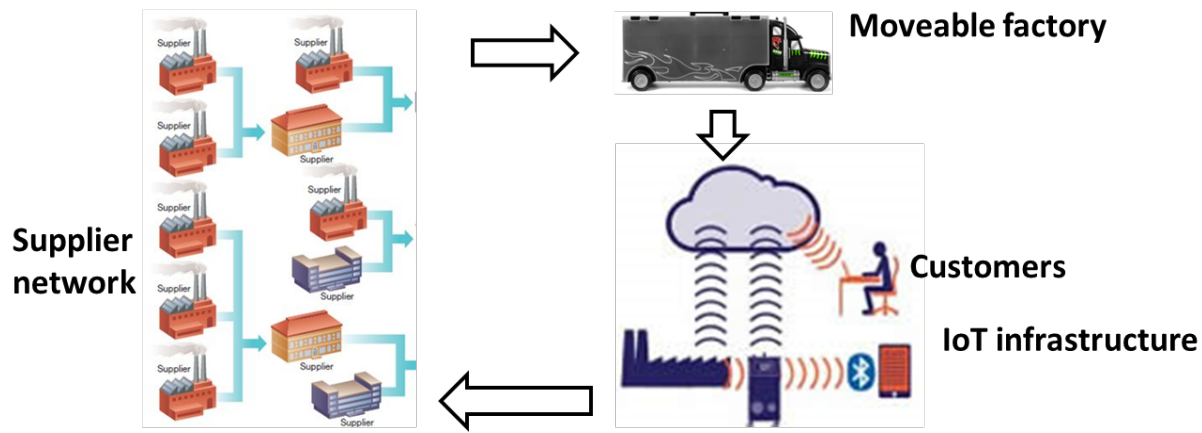


Example Applications



Internet-of-Things (IoT) Manufacturing with a “Factory-in-a-Box”

- A customer can place an order using an online platform.
- The order will be received by suppliers.
- Suppliers will load the semi-finished products into the movable factory (i.e., “factory-in-a-box”), which will travel directly to the customer location and provide an on-site production for the requested products.



Future Research



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- Factory-in-a-box in uncertain environment
- COVID-19 vaccine distribution based on supply chain network design

Reference



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IEEE
Access®

Pasha, J., Dulebenets, M.A., Kavvoosi, M., Abioye, O.F., Wang, H., & Guo, W., 2020. An Optimization Model and Solution Algorithms for the Vehicle Routing Problem with a “Factory-in-a-Box”. *IEEE Access*, IEEE, Vol. 8, pp. 134743-134763. DOI: 10.1109/ACCESS.2020.3010176.



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THANK YOU