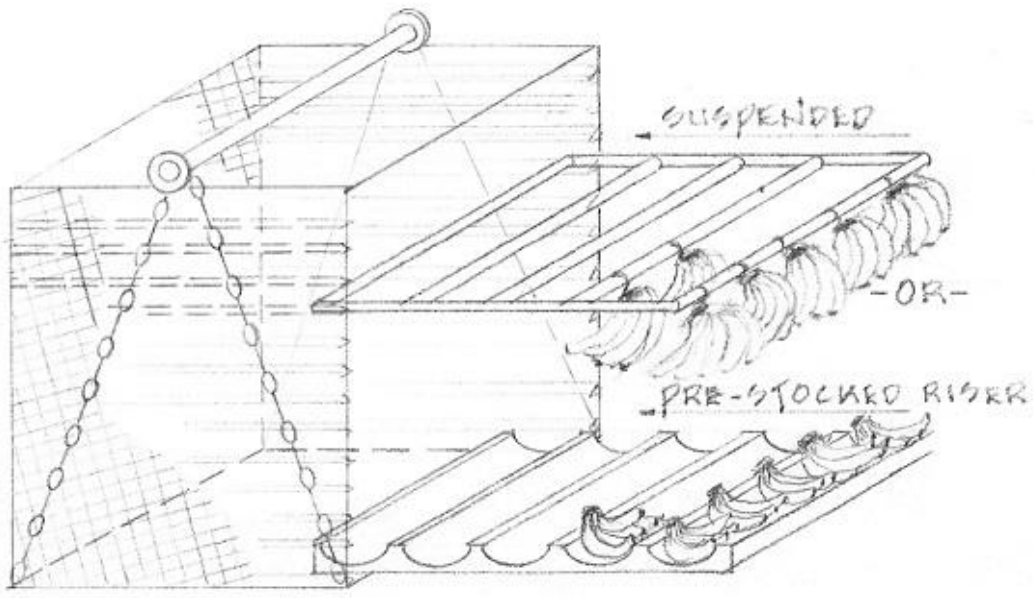
The Cargo Carousel System (CCS)

The Business Case for Transformational Innovation in the Banana Value Chain



(the above cubic "module" represents the checkerboard cubes in this 60-second video)

With the bananas suspended from a lattice framework or laid on their backs on a riser as displayed above, both options slide into or out of the cubic module; the module itself becomes a reusable rack that replaces the current wooden pallet piled high with cardboard boxes and plastic bags. Either option is retail display ready and will be available in varying sizes to make handling easier and to minimize labour touch points along the supply chain. Each option will be stackable at the bottom of the module to make room for whatever is coming back on the return trip. The walls of the modules will be made of heavy gauge wire-welded mesh to support the rack structure and to allow even air flow over the bananas for temperature/humidity control and ethylene exposure. The slats of the rack itself will allow for varying distances between the risers or the lattice framework to ensure the most compact load.

Each of the cubic modules is suspended from a carousel, think of an elongated Ferris Wheel that keeps its chairs or modules upright continuously as it rotates. This carousel is flattened to fit into a 40' or 53' steel shipping container and is housed in a framework that slides into and is affixed onto the intermodal steel shipping container or truck trailer and can be built to fit into *any* sized container, trailer or truck box. This allows the movement of the modules along the full length of the container/trailer in either direction so inventory is easily accessed no matter how high the containers are stacked. The intermodal steel shipping container is the most versatile application of this system due to its already available stacking and handling capabilities. Each "module" within the framework of the CCS replaces a wooden pallet and is a cubic design to utilize space most efficiently within the 8' x 8' confines of the container or trailer. ~~Pallets~~ Modules can now be double-stacked to utilize the full height of the container/trailer without crushing products underneath. Single-use packaging (cardboard boxes, wooden pallets, plastic bags and corner posts) can be eliminated because the suspended modules absorb shock and protect contents every bit as well as current methods, if not better. From either, a rack built to suspend bananas from, to a rack that supports retail display risers, touch points are eliminated throughout the chain to increase the efficiency, flexibility, scalability and sustainability of the entire value chain. Best of all, this system is completely complimentary to existing operations so there is virtually no change to current infrastructure or processes and the need to upgrade equipment or train employees is basically eliminated. We've patented this as the Cargo Carousel System (CCS).

Transport – the CCS allows deliveries and pick-ups simultaneously without ever leaving the dock whether you're transporting upstream or down. Route optimization software is eliminated along with empty back hauls by combining the supply and reverse chains into one, doubling potential revenue streams with an import/export mechanism at both ends of the value chains. Wooden pallets and cardboard boxes are replaced with a completely reusable system that is easily sterilized for phytosanitary regulations while Green House Gas (GHG) emissions are also minimized to save on increasing, government mandated carbon taxes.

Ripening and Storage – the CCS can ripen bananas while they're in transit and the ripening process can be initiated at any time of the supply chain journey. The built-in SCADA (Supervisory Control And Data Acquisition) system of the CCS combines cellular communication technology with an automated, redundant back-up duplex satellite system. This guarantees that a signal will never be dropped and that the ripening process can be initiated in real-time at any time, anywhere in the world to eliminate the need for costly ripening centres. The built-in SCADA system can also continuously monitor and *control* the temperature, humidity and ethylene exposure within the entire container so that distribution centres can be bypassed as well. Product can be stored much closer to the consumer; bananas never have to leave the intermodal container from harvest to retail shelf, so labour touch points are reduced exponentially.

Retail – the CCS does not require loading docks. This allows inventory to be stored much closer to the customer in temporary clusters of CCS containers stacked right in the parking lot of the store or DC or even out in a fenced-off field. Ripening is determined by the needs of the local retailer and pre-stocked display racks or retail display risers minimize handling at the retailer's location. An in-house certification program would verify fair and equitable treatment of farmers that share in the benefits of this system. Brand image is exemplified in the economic benefits to the retailer combined with environmentally sound business practices supported by socially responsible actions towards equality and belonging among impoverished producers and their communities.

Pool Distribution – this brings together all the benefits offered by the CCS. Each module of the CCS can be weatherproof, opaque, lockable, sealable or breathable and eliminates the need for a unique pool operator to "orchestrate" supply chain actors. Dimension-based pricing with a variable for weight allows the pooling of any and all modules with multiple manufacturing, trucking, storing and retailing operations simultaneously and continuously; mix 'n match any combination of modules at any point in the chain. With its reverse chain capabilities, there are no more excuses for empty backhauls, partial loads or *any* wasted space on *any* leg of the supply or reverse chains.

Visibility – although different interpretations and definitions abound, our definition of supply chain visibility is: the right information, in actionable detail, on events, orders, inventory, and shipments, up and down, and end to end, updated and presented in real time. This definition – ambitious by intention – sets the goal of having visibility through every tier of the supply base, with every supply chain partner, in real time. Software alone cannot achieve this but, when coupled with the CCS's sensor and satellite communication capabilities (IoT), true control tower visibility *and* control is achievable throughout the value chain in real time; the CCS is the only system to offer such extensive visibility as e-commerce continues to gain in popularity.

Bringing the Cargo Carousel System into the greater supply chain planning process offers tremendous strategic and performance potential. By leveraging the Cargo Carousel System as a callable capability and incorporating it into downstream transportation and upstream supply chain workflows, companies can enhance distribution/retailing operations, increase supply chain collaboration, optimize inventory, accelerate throughput velocity, improve asset utilization, have fewer empty backhauls/partial loads, reduce fuel costs, automate business processes, and increase efficiency and sustainability by an order of magnitude. The simplicity of the Cargo Carousel System makes it difficult to fully grasp its ability to reduce cost while simultaneously boosting performance.

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