**Solution Alternative Analysis**

**V.E.R.Y SAD Crates Solution Alternatives Summary**

There are five possible solutions for the V.E.R.Y SAD Crates company in which could improve their current system of locating and identifying their fish crates and reduce the percentage of fish crates in which are lost and stolen, this system should also provide the company with an easier method of billing the party responsible for damaging or not returning the fish crates, these solutions are as follows –

1. A Manual System
2. Bar Codes
3. Radio Frequency Identification
4. Global Positioning System
5. QR Codes

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| Alternative | Description |
| Manual System | The status quo for the V.E.R.Y SAD Crates company is currently a manual system of tracking the fish crates which they have in stock and for those which have been leased out, this current system is considered inadequate for the company as a large portion of their fish crates are currently being lost or stolen, thus the reason the company is looking to improve upon this manual system of maintaining their fish crate stock and leasing information. This system is the baseline for which is required to be improved upon. The company wishes to reduce the percentage of fish crates lost and to be able to maintain all records of their fish crates regarding to whom they have been released to, so in the case of lost or damaged crates the company will have sufficient knowledge of the amount of crates which were damaged or stolen and can then produce a bill to the liable offender. |
| Bar Codes | Implementing a barcode system would require each fish crate to contain a unique barcode in which the fish crate can be identified by whether the fish crate is large, small, green or brown. This system would require scanners for the fish crates at each collection and distribution point for the company in order to maintain a knowledge of which crate was being leased out and which crates were being returned. With the use of this system the company could then identify which crates haven’t been return based on the barcodes of the fish crates which were returned to a collection point. If the company found that there was damages to a number of crates or that a number of crates were stolen, the barcode system would allow the company to accurately bill the offending party who has lost or damaged the crates. |
| Radio Frequency Identification (RFID) | A Radio Frequency Identification System would require each crate to be equipped with a passive RFID tag which can be read by a RFID reader in which can read multiples of passive RFID tags simultaneously using Ultra-High Frequency Waves through the antenna of the RFID reader sending a radio signal to the tag in which the tag uses the signal to turn on and return the signal to the reader. This system like the barcode system would require a collection point and distribution point to identify the number of crates and the type of crate which is being leased out, upon return of the crates the system would allow the company to identify if there were stolen goods and how many were stolen. |
| Global Positioning System (GPS) | Using a GPS system would allow the company to determine which crates have been leased out and the location of each crate. With the ability to track the location of each crate, the percentage of lost crates could be drastically decreased. This system would allow the company to provide the leasee with a bill, along with the retrieval of the crate depending on it’s location which can be seen through the use of the GPS tracking. |
| QR Codes | Providing each crate with their own QR Code and similarly to barcode and RFID systems, the QR code system would allow the company to maintain knowledge of which crates are currently being leased out and which crates have been returned, allowing the company to determine if all the crates leased out were returned or not. Depending on the outcome the company can produce a bill to the offending party |

**Solution Alternative Effectiveness**

Each of the alternatives provide different angles on which the current manual system can be improved upon, the systems all have varying degrees of effectiveness and the cost of implementation for each of these systems all contrast.

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| Alternatives | Effectiveness |
| Manual System | The system in which the company uses currently is considered inadequate due to the lose of fish crates, maintaining a manual system won’t yield an decrease in the percentage of lost crates due to a manual system lacking the potential of tracking the identity of each and every crate which is leased out to their customers. A paper trail is highly ineffective for maintaining the stock belonging to the Fish Crate company as a paper trail is liable to be lost and illegible. A paper trail also doesn’t allow the company to provide a unique identifier for each crate. |
| Bar Codes | In comparison with the original manual system the barcode system would be a significant upgrade to the manual system as the company would be able to maintain a record for each crate as each crate would have a unique barcode assigned to it. Using barcodes each code has to be scanned individually and the scanned must have a direct line of sight on the barcode itself. Thus making the barcode more prone to damage in harsh environments where many of the companies clients will be using the crates. |
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