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| Document | : | GKL Setup Finding Report |
| Subject | : | The Architecture Of The Barcode System |
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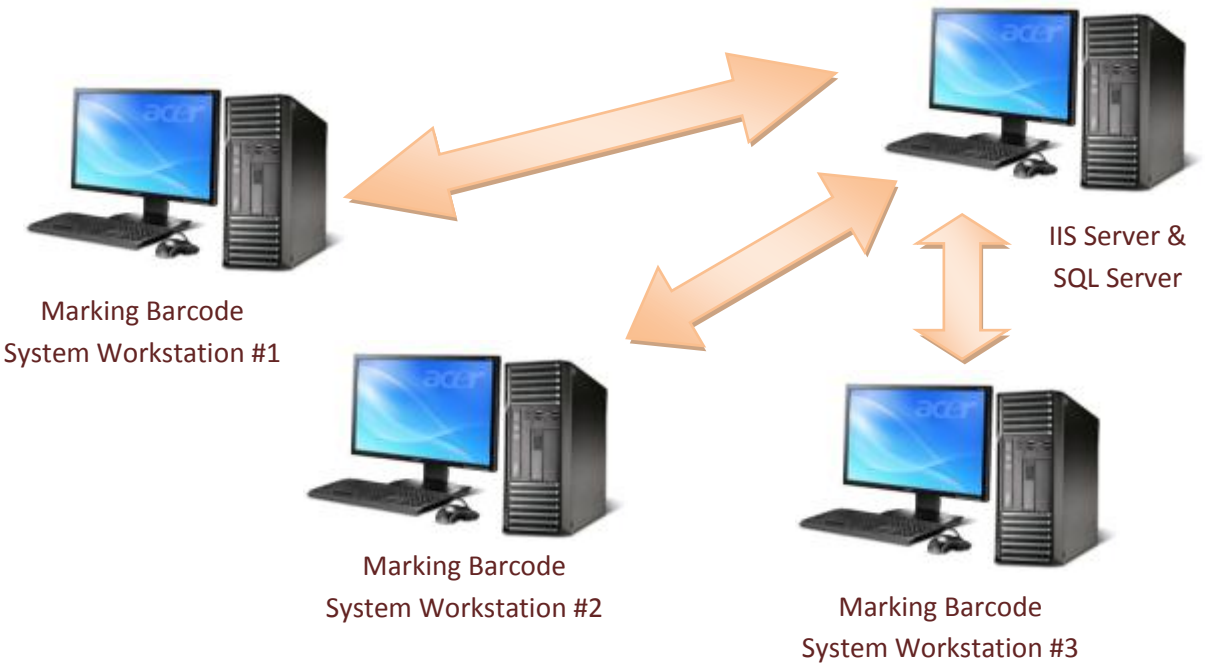
In conjunction with the wrong marking due to wrong spec. happened lately. I found that many direct as well as indirect person in responsible to Laser Marking process does not understand the Architecture of the Barcode system.

The Barcode system has been upgraded several time even today the system is still undergo some further improvement mostly on the Quality of Usability of the system. From a standalone application to the multitier client-server application, **the system was designed to totally abolish the duplicated week code for a single Lot.**

Generally, in most of the AT/CP product, the marking date is real time. Which means the marking week code is form at the day that the product is mark followed by the format '***ymd***'. And, the most critical criteria is, every single Lot should and must only have 1 week code otherwise it is consider under wrong marking. Therefore, the multitier client-server based application (as shown in figure below) was build to achieve the objective in preventing more than 1 week code was being form for a particular Lot.


The Barcode system is tightly ties to a database hosted at the server. The very first design of the system is using the ***ODBC*** terminology to update & retrieve data from the server where the ***Microsoft Access Database*** was used. In this design, the server does not actually act as a server, it is just opening the share to every of it client to access the database file. However, this simple construction could not handle simultaneous access by multiple clients which lead to ***data lost***.

The latest designed of the system application truly involve the server function where IIS as well as SQL server were used. The client application takes advantages of the server in order to make it more efficient. This was done by splitting the software components into several small components. Partially run at the client side and partially run at the server.


Well, no matter how the system was constructed, the concept remains unchanged. As shown in figure below.

At Data Entry level, the operators perform barcode scanning at the LPR by using handheld barcode reader to transfer Lot information to the Marking Barcode System.

### Data Entry Level

Whenever the system getting sufficient information from the operator, it will then send a request to the Server to ask for the marking characters. Before the Server generates a Marking Code, it is basically seeks a record at the SQL Server based on the Lot No. as primary key. This is because Lot No. is a unique no. There is an impossible two or more Lot using the same Lot No.

Now***, if a record was found at the SQL server, the data that store at the SQL server is retrieve and sent back to the client. Which means the old data is being use. Otherwise, a brand new marking code will be generated by the IIS Server.***

This is crucial in preventing duplicated week code for a Lot. Let consider the following situation.

*Illustration 'A' :*

*Lot PA7-12345, running at Machine No.1 on 16-07-2010 23:50 midnight. Let says, the machine breakdown at 16-07-2010 23:58. And it starts running back at 17-07-2010 00:15. Now, if the system never captures the old data, then definitely you get two week code for this Lot.*

That's the reason why the Barcode System is tightly ties to a Database. Again, for the reason the Database is hosted at the Server, well…, let take back the illustration '***A***' again, but the condition slightly change a little this time. Let says, the Machine is unable to continue running due to some technical issues. And apparently production would not hold the Lot for more than 1 or probably 2 days. At this time, production decides to continue the Lot at Machine No.2. Now, if the system is not

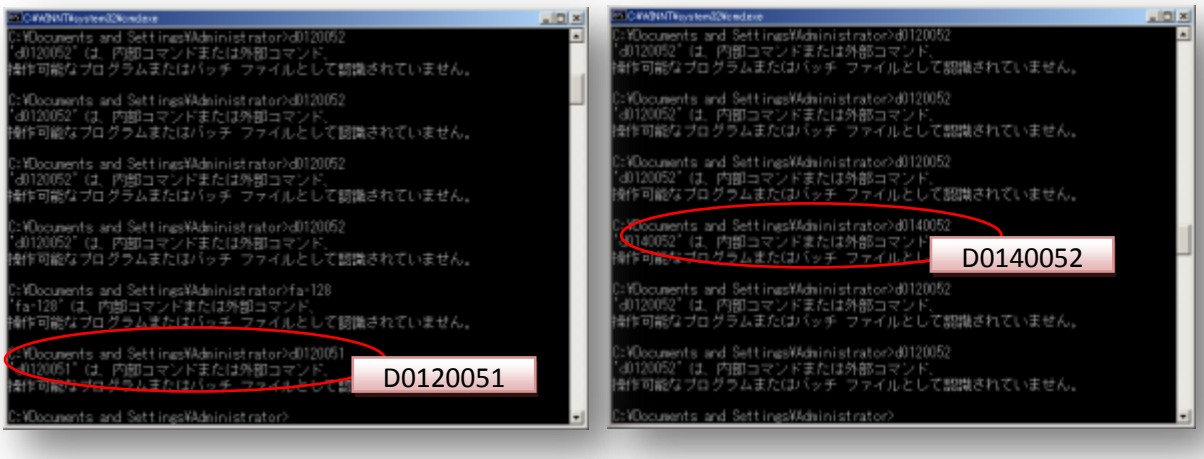
connected to the network to retrieve records from the Database, machine No.2 could generate another new week code and produce double week code for a single Lot.

Well, I hope this explanation provides sufficient knowledge to those who is still not understand the construction of the entire Marking Barcode System.

Now, **with tightly ties to a database, there are still some unwanted event was encounter throughout the implementation of the system. Obviously, the Barcode reader might generates faulty data, let says, suppose the Lot No. is PA7-00007, but then, the Barcode Scanner read as PA7-00001. The system will update a record at the SQL server based on PA7-00001 not PA7-00007. In this case, the possibility generated wrong week code could happen at IIS server.**

In order to address this issue, **MI is requesting a database from I.T. in order to lock the marking process if the Barcode System detected that the Lot No. is not match with the IMI No.**

The following figures showing some fault signal generated by the Barcode Reader.




The hand-held readers consist of a light source and a photodiode. The photodiode measures the intensity of the light reflected back from the light source and generates a waveform that is used to measure the widths of the bars and spaces in the bar code. ***Dark bars in the bar code absorb light and white spaces reflect light*** so that the voltage waveform generated by the photo diode is a representation of the ***bar and space*** pattern in the bar code. This waveform is decoded by the scanner in a manner similar to the way Morse code dots and dashes are decoded.

What I am trying to highlight hereby is the method of how we hold the Barcode scanner during the scanning process plays a significant important rules to prevent wrong data generated by the Barcode Reader which is categorize as photo-devices. Higher resolution which cost more may have better fault tolerance compare to lower-end product. That's why those days in most hyper-markets, hand-held Barcode Scanner is widely used. But today, we might notice that the Omni-Directional Barcode Scanner was used most in the Hyper-Market industry.