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## OPTIMIZING SERVICE VISIT FOR MANAGED PRINT BUSINESS BY USING MARKET BASKET ANALYSIS

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## **Optimizing Service Visit for Managed Print Business by Using Market Basket Analysis**

**Abstract:** The cumulative cost of printer service visits can be optimized by using “market basket analysis” to assist in deciding whether to replace multiple components of the system during a service visit for a single part.

This disclosure relates to the field of printers.

A technique is disclosed for optimizing printer service visits by using “market basket analysis” to assist in deciding whether to replace multiple parts of the system during a service visit for a single part.

In the managed print business, a service visit is required if a device experiences a failure, and the failure requires a part replacement. This visit is quite costly because it includes labor cost, travel cost, labor time, and part cost. A substantial portion of these replacements can be done in a single visit. For example, if a printer has a broken fuser, a technician will come and replace the fuser, and in the same visit check whether other parts also need replacement. However, in many cases these additional parts may still have some life left, and don't require replacement at that time. It's difficult to ascertain whether money will be lost due to replacing a still-functioning part too early or saved by replacing the still-functioning part at the same time.

According to the present disclosure, and as understood with reference to the Figure, a systematic calculation, based on a market basket analysis machine learning algorithm, helps decide whether to replace any still-functioning parts during a service visit for a defective part. The technique provides a recommendation when part A is being replaced whether also replacing part B will provide a cost saving to a customer or channel partner.

Applying the disclosed technique in a simple example, the lifetime replacement data 10 of a particular printer is considered. Referring to situation 2 20, Drum-C needs to be replaced after 250,000 pages have been printed. Drum-M still has some remaining life at that time but will need to be replaced after 255,000 pages have been printed.

There are two possible situations. The first is to have two different service visits, where the technician comes out and replaces Drum-C at a first time, and then after some additional time comes out again and replaces Drum-M. The second approach is a single visit to replace Drum-C, and Drum-M at the same time. In the first situation:

$$\text{total cost}_1 = \$\text{first visit} + \$\text{second visit} - \$\text{delta pages between visit}$$

In the second situation:

$$\text{total cost}_2 = \$\text{first visit} + \$\text{delta pages between visit}$$

By comparing  $\text{total cost}_1$  to  $\text{total cost}_2$  a recommendation can be made regarding what to do.

Now, if several printer platforms are considered, association rules and/or a market basket analysis is used to get the distribution of first part replacements, and then what next part replacements follow that. Furthermore, for each pair of part replacements, the number of

pages printed between them can be estimated using the distribution of pages printed between replacements.

The disclosed technique advantageously provides a cost savings to a customer or channel partner.

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