

Calculate This

Creating a Total Cost of Ownership for Printers

Making changes to a printer fleet can be a costly venture. Understanding the costs involved, requires a “total cost of ownership” (TCO) process that looks at all of the costs the company has incurred in procuring the devices and providing ongoing support.

No standard way of calculating the TCO of printers exists today in the industry. This is largely due to the vastness of the industry itself. Many vendors offer different financing solutions based upon customers’ needs. Vendor A, for instance, may offer a printer that can be purchased outright, leaving consumables, support and maintenance for the customer to deal with. Or the device could be leased with a monthly minimum and a “per click” charge that covers the cost of the device, consumables, support and maintenance throughout the life of the device. The vendor may also offer hybrid solutions, such as allowing the customer to purchase the device outright with consumables, support or maintenance provided by the vendor. Whatever the arrangement, the costs of procurement, installation and ongoing operations of the device must be tracked from the outset.

Since the cost of color printers is typically higher than black and white (B&W) printers, it is best to set up separate TCOs for both types of device. The essential sections that either TCO will need to include are: total pages per year (estimated or actual); acquisition costs; support; maintenance (not including parts); parts; and consumables. These costs must all be tracked using a 12-month data input, estimated or actual. To estimate the data for 12 months, multiply the quarter-end data by 4, 2, 1.25 or 1 depending on whether it’s the 1st, 2nd, 3rd or 4th quarter, respectively.

Total Pages per Year

Total pages per year is calculated by adding the total page count for all the devices in the company. Typically, color printers will include both a B&W and a color page count.

Figure 1 demonstrates the formula for an annual estimate utilizing 1st quarter data.

$$\text{Total Pages per Year} = \text{Sum of Page Count of all Devices} \times 4$$

Figure 1

Acquisition Costs

Since color printers print B&W images, the acquisition costs

for B&W prints on a color device will need to be factored. This percentage is equal to the total number of B&W prints divided by the total prints from color devices.

Obtaining the acquisition costs begins by multiplying the total B&W or Color Year to Date (YTD) acquisition cost by the number of years of depreciation. The result is the Year to Date depreciated value of the type of device. Next, multiply the total B&W or Color acquisition cost by the Cost of Capital percentage. Finally, multiply the YTD depreciated value of the type of device by the Property Insurance and Tax percentage. This will result in the YTD Property Insurance and Tax. These three calculations should be made for both color and B&W devices annually and retained for the number of years that a device is depreciated.

The total B&W acquisition cost is the sum of the YTD B&W depreciated value, YTD B&W Cost of Capital and YTD B&W Property Insurance and Tax plus the sum of the YTD color depreciated value, YTD color Cost of Capital and YTD color Property Insurance and Tax multiplied by the percentage of B&W prints on a color device.

The total color acquisition cost is the sum of the YTD color depreciated value, YTD color Cost of Capital and YTD color Property Insurance and Tax multiplied by the percentage of color prints on a color device.



$$\text{Percentage Black and White Prints on a Color Device} = \frac{\text{Total Black and White Prints on Color Devices}}{\text{Total Prints on Color Devices}}$$

$$\text{YTD Depreciated Costs} = \frac{\text{YTD Acquisition Costs (Black and White or Color)}}{\text{Number of Depreciation Years}}$$

$$\text{YTD Cost of Capital} = \text{YTD Acquisition Costs (Black and White or Color)} \times \text{Cost of Capital Percentage}$$

$$\text{YTD Property Insurance and Tax} = \text{YTD Depreciated Costs} \times \text{Percentage Property Insurance and Tax}$$

$$\text{Acquisition Costs}_{BW} = \left(\text{YTD Depreciated Costs}_{BW} + \text{YTD Cost of Capital}_{BW} + \text{YTD Property Insurance and Tax}_{BW} \right) + \left(\text{YTD Depreciated Costs}_{Color} + \text{YTD Cost of Capital}_{Color} + \text{YTD Property Insurance and Tax}_{Color} \right) \times \text{Percentage Black and White Prints on a Color Device}$$

Figure 2

Support

The support section includes all the labor costs involved in procurement, installation and continuously supporting the device. If devices are leased, include the monthly minimum charge in this section. These costs need to be actual or estimated year-end costs.

Figure 3 illustrates how the support costs are established.

$$\text{Support Costs} = \text{Cost of Procurement} + \text{Cost of Installation} + \text{Cost of On-Going Support} + \text{Average Monthly Minimum for Color Printers}$$

Figure 3

Maintenance

The maintenance section is used if support for the devices is provided by a third-party vendor that has actual labor costs charged back to the company. Internal costs associated with maintenance should be included in the support section while maintenance costs incurred by the device vendor through click charges are included later.

If the total spent on maintenance of printers is unknown due to the third-party vendor supporting different devices throughout the company (e.g., desktops, laptops and printers), this amount can be calculated by multiplying the estimated time spent supporting and maintaining printers by the total cost of the third-party printer vendor support. The total spent on

maintenance of printers is then divided by the percentage of B&W (Figure 4) and color printers to obtain the maintenance costs on both types of devices.

$$\text{Maintenance Cost} = \frac{\text{Estimated Percentage of 3rd Party Support Vendor Time Spent on Printers} + \text{Annual 3rd Party Vendor Support Cost}}{\text{Percentage of Black and White Printers}}$$

Figure 4

Parts

The total cost for both B&W and color printer parts is attained by multiplying the total cost of printer parts by the percentage of B&W (Figure 5) and color devices. This section is not needed if the devices are leased and the parts are included in the click charges.

$$\text{Parts Costs} = \text{Total Cost of Parts} \times \text{Percentage of Black and White Printers}$$

Figure 5

Consumables

Depending on how consumables are ordered within an organization, determining the total amount spent on consumables (B&W and color toner, staples, ink, etc.) can be difficult and may require some estimation. For instance, it may be impossible to obtain the total amount spent on ink-based printers because the users may purchase these cartridges using their business credit cards at the local office supply store. Furthermore, the consumables section may not be needed if consumables are included in the lease and click charges.

If consumables are tracked, it is best to break down the costs by each consumable (color and B&W toner, ink, staples, etc.). Each consumable will then need to be totaled into two categories: B&W consumables and color consumables. Ink costs should fall under color toner and staples will need to be broken down by the percentage of color and B&W printers and the costs allocated appropriately. The cost for color consumables is shown in Figure 6.

$$\text{Color Consumables Costs} = \frac{\text{Total Cost of Color Toner} + \text{Total Cost of Ink} + (\text{Total Cost of Staples} \times \text{Percentage of Color Printers})}{\text{Percentage of Color Printers}}$$

Figure 6

The Total Cost of Ownership

The TCO for both color and B&W printers is calculated by adding the total acquisition, support, maintenance, parts and consumable costs. The total cost is then divided by the total pages per year resulting in the organization's total cost per page.

If the devices are leased, the click charges will then be



added to the total cost per page. Most of the time, the click charges will differ between the various models and even within the same model type. The simplest way to get the click charge is to average the click charges for both B&W and color printers. This will result in a loose, but standard representation of the printer vendor's costs. This average click charge is added to the organization's cost per page to acquire the total cost per page (Figure 7).

$$\text{Total Cost per Page for Color Printers} = \text{Average Color Click Charge} + \frac{\text{Acquisition} + \text{Support} + \text{Maintenance} + \text{Parts} + \text{Consumables}}{\text{Total Pages Per Year}}$$

Figure 7

The total cost per page will paint a good picture on what it costs the organization every time a print is made in color and black and white. This cost can be taken one step further to establish the TCO for each device by taking the total cost per page and multiplying it by the total prints per year. The result is then divided by the total number of devices. This number is the total cost of ownership for B&W or color printers (Figure 8).

$$\text{Total Cost of Ownership for Color Printers} = \frac{\text{Total Color Cost Per Page} \times \text{Total Color Prints per Year}}{\text{Total Number of Color Devices}}$$

Figure 8

Assumptions

Although this TCO will provide a baseline with which the organization can monitor the cost to print, several assumptions must be made.

1. This TCO assumes that there is one model for B&W and color. Even though the data can be obtained from all the models in the organization, it is then averaged to create one "standard" model that represents all of the models. This assumption can be negated by completing a TCO on each B&W model in the organization, but this could be very comprehensive and hard to manage in the long term.
2. The costs involved in setting up and maintaining the network to which the printers are attached are not incorporated because it is assumed these are operational costs incurred by the organization for everyday operations.

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