

White Paper



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How Predictive Analytics Can Reduce Print Spend for Healthcare Providers

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Executive Summary

While the application of predictive analytics is not unfamiliar in healthcare landscape, it is more commonly applied to more effective patient care – not patient communications. But as healthcare systems are increasingly tasked with finding ways to save money and demonstrate efficiencies, there is growing interest in leveraging predictive analytics across the health system, including such cost centers such the internal or in-plant print and mailing operations.

The reason is simple: waste is rampant throughout the health system. According to the Consumer Union, \$1 in \$3 spent in healthcare is wasted. The National Alliance of Healthcare Purchaser Coalitions confirms 60% of healthcare employers fail to address this waste. With both patients and elected officials clamoring for ways to save costs on healthcare, it's imperative that health systems find ways to improve control and accountability

A 2018 survey from the Society of Actuaries (SOA) reveals:

- 85% of healthcare payers and providers are using predictive analytics or plan to do so within the next 5 years
- 60% of healthcare executives forecast that predictive analytics will save 15% or more
- 52% of healthcare executives and healthcare payers say reducing costs is the most important outcome to achieve

One area ripe for cost savings is the design, production and distribution of vital documents and patient communications. Recent studies have revealed that health systems are spending as much as 2% of their net patient revenues on this function. This spend does not include equipment, such as office printers or multi-function devices. Applying predictive analytics offers an effective strategy to help reduce this waste by improving efficiency, workflow, accountability, and control of the production of these professional and vital documents.

Cost of Patient Communications

According to a recent report issued by *Printing Impressions*, healthcare organizations printed more than 100 billion production and commercial pages in 2018 at a cost exceeding \$10.5 billion a year. That cost is expected to increase by another 5% in 2019 as the rising and aging populations move toward greater access, and resources to pay into a world-class communication system, along with higher volumes of color personalized communications.

In Figure 1, Production and Commercial print falls under the category of Excess Administrative Cost, which represents an industry spend of \$190 Billion.

One reason print is often overlooked is because the budgets for print related services in healthcare organizations across multiple departments including: marketing, sales, IT, design, communication, regulatory compliance, patient acquisition, and admissions.

Another reason document cost is often overlooked is because most organizations cannot measure their costs, which are often buried in different departments and budgets. Predictive analytics can help healthcare providers understand their document cost and also identify the opportunities for savings. Although not savings associated with predictive analytics according to the IPMA Whitepaper *Case Studies of In-Plants that Save Money*, seven in-plants saved between \$200K-\$2.5M with an average \$700K savings.

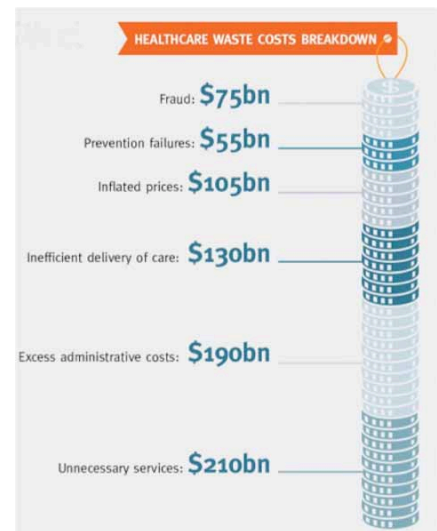
When looking at their document and communications spend, healthcare systems need to examine:

- How and where can we aggregate the total cost of the print spend to optimize and improve patient care?
- How do we better control our brand and compliance associated with these documents?
- How do we gain a system-wide view and control of printed documents that are being sent off-site to commercial printers?
- How much are we spending on the design, production and distribution of documents and patient communications across our entire system?
- How does our total document expense compare to other leading hospitals and IDN's?
- How much money could we save by bringing all print in-house, and how could that translate to reduced patient cost?

Where are the Opportunities?

The impact of effective document design, production and distribution goes beyond the dissemination of information. It can impact additional critical priorities, such as reducing re-admissions, enabling earlier interventions to reduce the severity of chronic diseases, and identifying opportunities to reduce costs and improve care.

Figure 1: Breakdown of Healthcare Waste



Source: *US Healthcare Costs: Conditional Critical infographic*, eyeforpharma.com

HOW DOES IT DOES THIS?

A Navigant study (2017) of 2,300 hospitals concluded that hospitals could save 17.8%, or up to \$9.9 million per hospital per year, using predictive analytics. According to the study, the greatest opportunity to save money lies in reducing supply chain costs. However, the \$9.9 million number did not consider savings that can be achieved by optimizing the spend on production document design, printing, and distribution. Unfortunately most hospitals don't know the total cost of their internal and external print spend which makes it impossible to identify the savings potential.

According to a GE Healthcare and Intel whitepaper “Healthcare Analytics and the State of the Industry”, predictive analytics creates four saving opportunities (Figure 2). The second largest is “drive efficacy, throughput and productivity.” In-plants can take advantage of new hardware and software automation to increase productivity and decrease cost.

The overall cost per page for document production is a good metric of print production efficiency. All Associates Group (AAG), a leading expert in document analytics, reports that healthcare providers pay as much as \$.65 per page for the fully burdened cost per page.

Included in the fully burdened costs of production printing are creative costs (internal and external), editorial costs, administrative costs, IT, project management, production equipment service and supplies, labor, facilities, warehousing and archiving, fulfillment, shipping distribution, and inventory obsolescence.

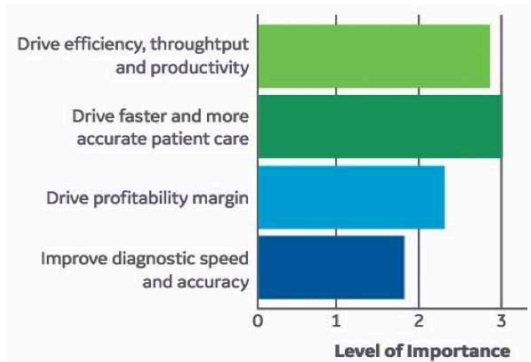
Predictive Analytics Is the Answer

The 2018 tech survey from *Managed Healthcare Executive* confirms that the greatest challenge is turning data into actionable information. Is the data available to calculate the fully burdened costs of production printing? In most organizations, the answer is no.

But what if the data were already available and actionable, there was minimal cost or time investment required to obtain it, and the data was reliable? Predictive analytics can be used to generate a reasonable estimate of an organization’s current fully burdened print spend and associated print volumes.

Integrated data sources and technology from AAG and other leading companies were used to create a tool that can predict the fully burdened cost of production and commercial print and mail services based on comparative data from other healthcare providers. Since offered, it has proven to be 90%-95% accurate for traditional printed documents.

Figure 2: Greatest Benefits for Healthcare Companies



Source: GE Healthcare and Intel. “Healthcare Analytics and the State of the Industry” Survey. 15 January 2018

The model is based on AAG’s EDAM® system, which leverages healthcare employment data derived from the Census Bureau, North American Industry Classification System (NAICS), leading industry analytics, and geography. The model uses mathematical and statistical techniques based on over 20 years of experience.

This analysis is broken into four categories of analytics: metrics, algorithms, causal inductive reasoning, and trends. AAG statistical analysis uses over 1,000 key metrics, providing a constant set of data points. Examples include pages per patient discharge and per employee, average cost of documents as a percentage of net patient revenue, and total cost per page.

This proven predictive analytics model can predict the fully burdened cost of production and commercial printing, which includes design, IT support, document creation, print, finishing, administrative costs, distribution costs, etc.

Inductive reasoning (Insights generated by this analytics model help) helps identify the likely root causes of cost overruns for more efficient production processes. This results in recommendations for reducing or eliminating wasteful practices (workflow bottlenecks, redundant technologies, rework due to errors, etc.)

Metrics Provided

The data is broken into four sections or tables, with each successive table based on data from the previous section. This first table, Predictive Enterprise Document Assessment Methodology, uses key performance indicators to determine communications performance, which is benchmarked against other healthcare systems and ranked as a percentile.

Figure 3: Operational and Financial Benchmark of Communication Efficiency

Predictive Enterprise Document Assessment Methodology						
Fiscal Year	12/31/2017	Financial Strength	Performance	Percentile Ranking	Current Communications Percentile Ranking	
Net Patient Revenue	\$ 1,336,941,008	Net Patient Revenue growth	5.0%	63%		
Number of Discharges	60,378	Net Operating Profit Margin	6.0%	76%		
Number of Employees	7,623	Days Sales Outstanding	59.80	24%		
Staffed Beds	940	Optimization across care	0.00	83%		
Total Burdened Cost of Production & Purchased Documents	Predicted Output Pages	Predicted Burdened Document Costs	As a % of Burdened Costs	As a % of Revenue	Employees: Avg. Pages Per Year	Employees: Avg. Cost Per Month
Production Documents:	23,824,495	\$ 7,148,991	100.00%	0.53%	3,125	\$78.15

Source: ALL Associates

The metrics used to calculate results in this table include:

- Net patient revenue and growth with percentile ranking benchmarking
- Number of discharges, operating profit margin, percentile ranking benchmark
- Number of employees, days sales outstanding, percentile ranking and benchmarking
- Staff beds and an estimate of optimization potential across care with percentile ranking

This table is the first one created in the analysis. The speedometer in the top right section represents the average of the four metrics identified under the Financial Strength column: patient revenue growth, net operating profit margin, days sales outstanding, and optimization across care.

In the bottom portion, the total number of pages is estimated along with the burdened costs, as a percentage of revenue, average number of pages per employee per year, and the average cost per employee per month:

- Net patient revenue is approximately \$1.4 billion, and the net patient revenue growth is 5%, which results in a performance score of 5% and a percentile ranking of 63%
- The number of discharges was 60,000 patients; the net operating profit margin was 6%, for a 76% ranking compared to other healthcare organizations
- The number of employees is approximately 7,600, and the days sales outstanding is about 60, resulting in a score of 24% compared to others
- Number of staffed beds is 940; the optimization shows a percentile ranking of 83%
- Combining these scores together results in a communication ranking of 62%

The table reflects that the estimated total production page volume is predicted to be 23 million pages per year. The predicted costs are \$7.1 million per year, the percentage of revenue is .53%, and the average pages per employee per year is 3,125 at an average cost of \$78.15 per month per employee. For many hospitals this is the first quantitative information of their total print spend which can be used to benchmark performance and identify savings opportunities for new Value-Added products.

Figure 4 shows the different types of print applications that can be predicted based on information from the first table. These include Traditional Applications (forms, reports, manuals, publications) and Value-Added applications such as direct mail, advertising, promotional and transactional documents, wide format, and signage.

Figure 4: Estimated Savings Opportunity by Print Application

Production & Purchased Documents Output Application Types	Predicted Output Pages	Predicted Burdened Document Costs	Document Costs per Discharge	Estimated Savings Opportunity	Savings Potential Per Discharge
Static Reproduction (Non Variable Output)		\$	\$	\$ %	\$
Specialty (Forms, Reports, Wide Listings)		\$	\$	\$ %	\$
Manuals, Publishing, Reports, Publications		\$	\$	\$ %	\$
Other		\$	\$	\$ %	\$
Total Traditional Applications:		\$	\$	\$ %	\$
Transactional Output (Variable)		\$	\$	\$ %	\$
Direct Mail & Correspondence (w/inserts)		\$	\$	\$ %	\$
Advertising, Promotion		\$	\$	\$ %	\$
Brochures, Inserts, Catalogs		\$	\$	\$ 5.0%	\$
Signage, Posters, Wide Format		\$	\$	\$ %	\$
Total Value Added Applications:		\$	\$	\$ %	\$
Total Production Print & Mail:		\$	\$	\$ %	\$

Source: All Associates

In comparing Traditional Applications to Value-Added Applications, we typically see a higher percentage of traditional work being done in in-plant operations. However, volumes, spend, and savings opportunities are much greater with Value-Added applications.

The use of legacy technologies and applications – which are costly and less efficient – make it difficult to cost justify investments of in-house value-added applications . However, today’s advanced production and software technologies are more affordable. This gives in-plants the ability to invest in current technologies and bring these critical applications back in house, offering the benefits of security, control, response, and cost containment.

Increase Value-Added Document Production

For in-plants to remain viable, they must evolve from the tactical approach of producing only traditional products (printing, copying, and mailing) to more value-added, integrated products and services. Included in these value-added products are large -format printing, design, fulfillment, variable-data printing, database services, and cross-channel or omnichannel communication.

The predictive analytics model provides granular information about both traditional documents and value-added documents. The data within the model then allows organizations to put a stake in the ground and identify the ratio of traditional to value-added services to chart a path for growth and efficiency.

How a Healthcare Production Analytics Assessment Can Help You

As mentioned earlier, fully burdened costs are largely unknown because they are buried within different departments and hidden in different budgets. Using the predictive analytics model, spend can easily be separated into different cost centers, departments, and support areas. One of the advantages of identifying these specific costs is to more accurately benchmark against other organizations and identify savings and value-added services opportunities.

The full report from Ricoh shows these cost centers and departments along with savings opportunities typically amounting to more than \$1 million a year in a medium-sized hospital system (i.e. \$500M net patient revenues). The model provides in-depth information designed to help healthcare systems better quantify, benchmark, and make better business decisions about their production and commercial document spend. The number of ways to utilize this information is only limited by your imagination.

Howie Fenton has been a consultant in the printing industry for 30 years specializing in benchmarking commercial and in-plant print production. To learn more visit Ricoh.com.

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