

EDAM

White Paper

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The EDAM Predictive Reports referred to in this White Paper are generated by an Expert Predictive Modeling System called EDAM[®] (Enterprise Document Assessment Methodology) developed and maintained by ALL Associates Group. ALL Associates Group uses exhaustive research and robust statistical techniques to combine government data on employment and industry types with their proprietary databases and algorithms on fully burdened costs of document systems.

The predictive reports referred to in this White Paper are generated from the use of EDAM Predictive Modeling Tools and are intended to be used for general guidance and discussion purposes only and should be verified using your company's own data and mode of operation.

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Introduction

ALL Associates Group use a Systems Thinking approach to understand the dynamics of documents. Like any system, the document system is a whole made up of parts. Each part can affect the way other parts work and the way all parts work together will determine how well the system performs. This is a fundamental challenge to traditional management thinking. Usually, both customers and vendors have focused on the separate pieces of the document system (photocopiers, printers, fax machines, supplies, filing cabinets, postage, document management solutions integrated into information technology, etc). Managing in this way always causes sub-optimization, where parts may achieve their goals at the expense of the whole. The following section describes the fundamentals of ALL Associates Group's approach to understanding the 'big picture' of document systems that can lead to extraordinary transformational change and competitive advantage.

What is a System?

A System is a whole, which consists of interdependent and interacting parts and a defined purpose. A system is not the sum of its parts – it is the product of their interactions. When disassembled it loses its essential properties as do the parts.

The performance of a system depends on how well the parts fit together, not how well they perform individually. In addition, systems do not operate in a vacuum. Understanding how they interact with other systems is also important to maximizing overall performance.

We live, work and play in a multi-systems environment, such as transport systems, hospital systems, planetary systems, the human body, an orchestra, a corporation, etc. The document system is one more example.

What is Systems Thinking?

Systems Thinking is a way of thinking about life, work, organizations, processes, etc. based on the importance of relationships and interconnections of its components, be those physical resources, organizational or cultural dynamics. Systems Thinking also provides a language and a scientific technology for understanding and dealing with complexity and change.

The foundation of Systems Thinking is built on three elements:

- A set of principles and theories for thinking about the whole and the interrelationships of the parts;
- A language for understanding change, uncertainty and complexity, including diagrams and tests to explain non-linear cause and effect relationships;
- A technology for modeling complex situations underlying business, economics, scientific, and social systems.

What is a Document System?

If you asked 100 people to describe their document system, you would likely receive 100 different answers. Most people can only describe the part they touch. The consequence is that without an

understanding of the whole, there is significant potential for waste and dysfunction across document-centric activities that run through every business process.

This potential for waste is a common phenomenon within the document world. Historically, control and management has only focused on individual parts of the system, involving many different decision-makers, influencers and budget-holders – often operating discretely, with no overall view of the whole.

In 1997, ALL Associates Group developed a methodology to provide (i) individual organizations with a 'big picture' view of their own document system and (ii) enlightenment on the potential scale of improvements in efficiency and effectiveness.

We use the following high-level definition and purpose statement for a document system:

A document system comprises resources, technologies and human activity, which through their interaction allow for the creation, exchange, distribution, retention and management of paper-based and electronic documents.

An organization requires a well-executed document system to enable its internal and external stakeholders to communicate, exchange and record information necessary to meet the objectives of the organization.

ALL Associates Group's methodologies seek to provide the same common vision and insight that is inherent in symphony orchestras but typically absent in document systems.

EDAM Origins

In 1997, ALL Associates Group created their Expert System called EDAM[®], standing for Enterprise Document Assessment Methodology. EDAM is a complex statistical modeling tool that rapidly generates reasoned estimates about document systems based on minimal input of base data.

The underpinning databases, algorithms and metrics that support the statistical and predictive modeling are updated every year and EDAM is now in its 15th Edition. EDAM uses three interlocking frameworks to generate reports that can cover multiple scenarios that extend over office, production and commercial document environments.

Level 1 Framework – Base Costs

Base Costs reflect the basic components used to create a printed page. In the office environment, this includes hardware, supplies, paper, maintenance and power. In the production and commercial environments, the cost of dedicated print shop workers and facilities is also included.

The marketplace often refer to these costs as the cost per page (CPP) or total cost of ownership (TCO) or total cost of printing (TCOP).

Level 2 Framework – Burdened Costs

Burdened costs extend beyond the Base Costs to include other directly associated expense that is often fragmented or hidden within an organization. This includes associated information technology costs, procurement, distribution, storage and other document management activity. In the office environment, it also includes the end users' time interacting with office equipment.

The mix and type of burdened costs vary by commercial, production and office document environments. Each has a discrete set of components and expense lines. For example, commercial print activities will involve warehousing, inventory management and distribution

that are not present within the office document silo.

ALL Associates Group refers to burdened costs as EDAM costs – the terminology is comparable.

Level 3 Framework – Sustainability Costs

An increasing number of organizations have recognized that there are additional interconnected costs and externalities that have to be considered beyond the Base Costs and Burdened Costs. These have an impact on the overall document system and, therefore, need to be visible during the decision-making processes related to document solutions or document strategy development.

For example, the burdened costs within the office space do not include people's time creating, reading, manipulating and managing documents. While these additional costs may need to be factored in to the equation, it also raises potential personnel issues, such as the growing number of knowledge workers that have to deal with greater volumes of electronic and paper-based information. Numerous international studies have identified that this increasing information overload may create workplace stress and work/life balance issues.

Other issues may also need to be taken into account. These can be described as externalities.

For example, there is increasing external pressure and regulation to conduct business in an environmentally responsible way. Many companies and public agencies have now adopted overarching principles to guide their activities and decision-making. So-called green buildings, zero waste manufacturing and energy conservation are common examples of aligning company policies with operational decision-making.

A company's documents system also involves considerable use of labor resources, natural resources and a liability for toxic waste.

Today, many document-related decisions are taken at a sub-silo level. To overcome this propensity, we developed the nested three level frameworks to help decision-makers at any level benefit from an understanding of a wider view. For example, individuals involved with decision-making for one or more *base cost* elements can now see other related *base costs* and their associated *burdened costs*. Likewise, individuals already involved with decision-making at the *burdened costs* level benefit by seeing the extended *sustainability costs*. Wherever the decision-making process currently lies, there is always an advantage of a having a broader picture.

With this objective in mind, the following criteria guided the creation of our tools and methodologies to deliver personalized and tailored models rather than generic factoids:

- Personalization to individual companies or organizations
- Office, Production and Commercial Document Environments
- Segmentation by 315 industry classifications
- Segmentation by geographical distribution
- Scalability to any economic frame of reference
- Scalability to different decision-making dialogue levels
- Special extensions for environmental and social document dynamics
- Special extensions for business process document dynamics
- Comparative and competitive reports between companies and industries

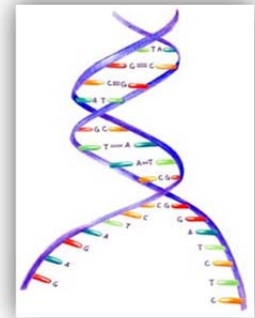
This unique, science-based EDAM approach affords an 'instant' predictive analysis of complex document systems that are otherwise 'out-of-view'. Without a holistic 'big picture' assessment, it is increasingly difficult for companies and organizations to make informed decisions on:

- Prioritization of specific document-related improvement projects
- The development of an enterprise-wide document strategy
- The quantification of potential savings, efficiencies and new value creation
- The development of performance measurement metrics for continuous improvement

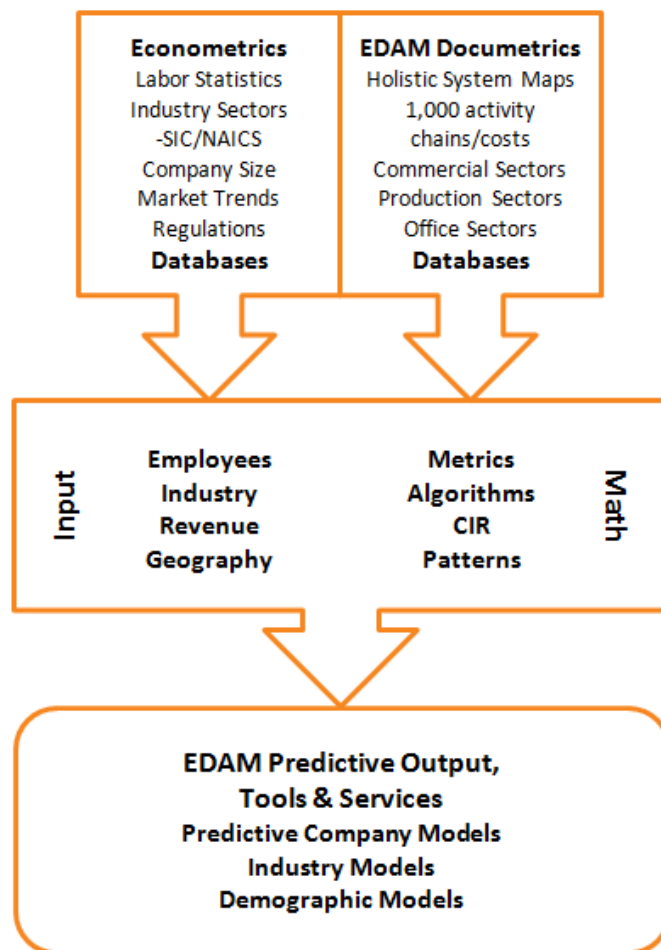
The EDAM Methodology

ALL Associates Group used the same type of thinking to devise a document health check to: (i) statistically model the document fingerprint for an individual company, (ii) identify potential areas for improvement and (iii) scale the size of potential benefits.

This initially required the design of an elegant and robust set of statistical tools and proprietary algorithms that interact on a core set of two databases, enabling an expert to generate a well-reasoned predictive report. We found a metaphor in DNA.



Although DNA (deoxyribonucleic acid) deals with far more complex issues than document systems, we observed some useful parallels that guided our design of the EDAM Expert System.



DNA is the code in which almost all genetic information is encoded. DNA as a compound has the form of a double helix, held together by sequences of the compounds guanine, adenine, cytosine and thymine. These four compounds are commonly referred to as G, A, C and T. Based on just these four base components, billions of individual sequences can be generated providing each of us with a unique genetic fingerprint.

Like DNA, ALL Associates Group uses a double helix of interacting databases. The first database sets are called Econometrics, which deal with employment, industry types, economics and geographic distribution. The second database sets are called Documetrics. They deal with the interacting components that make up the whole document system.

Our equivalent connecting compounds are Employment, Industry classification, Revenue or revenue equivalents and Geography that describes the regional or country distribution. Using these four basic inputs in conjunction with our algorithms and both sets of databases, we are able to generate a unique document fingerprint for any organization, industry or geographical

region.

While the EDAM Expert System relies on our proprietary techniques and intellectual property, this high-level chart shows the basic process flow of systems thinking and statistical science used to generate reasoned predictive models:

- Two interacting sets of databases
- Input of Employment, Industry, Revenue, and Geography
- Mathematical reason
- Generation of Predictive Models

General descriptions of these key components are described in the following sub sections.

Econometrics

The first group of databases deals with the econometrics of a given country. This includes extractions and analysis of employment data, occupational characteristics, industrial segmentation, company size dynamics and geographical distribution. As an example, in the USA, the base information is derived from such sources as:

- The Bureau of Labor Statistics on employment, wages, occupations and industries
- Bureau of Economics
- The US Economic Census on business distribution
- National Center for Education Statistics, Institute of Education Sciences, U.S. Dept. of Education
- US Department of Defense Military Personnel Statistics
- Fedstats
- Environmental Protection Agency

For other geographies, equivalent governmental databases are used.

Based on this broad range of fragmented econometric data sets, ALL Associates Group annually analyzes, consolidates and generates a consistent set of EDAM metrics to model companies by size, employment, industry and across single or multiple geographies.

Individual EDAM metrics are maintained on a broad range of elements, including (but not restricted to):

- 770 detailed occupations set out in the Standard Occupational Classification¹
- 315 industry 4-digit level classifications within the North American Industry Classification System²
- Company and establishment employment size data from census data
- Special databases for educational and government agencies

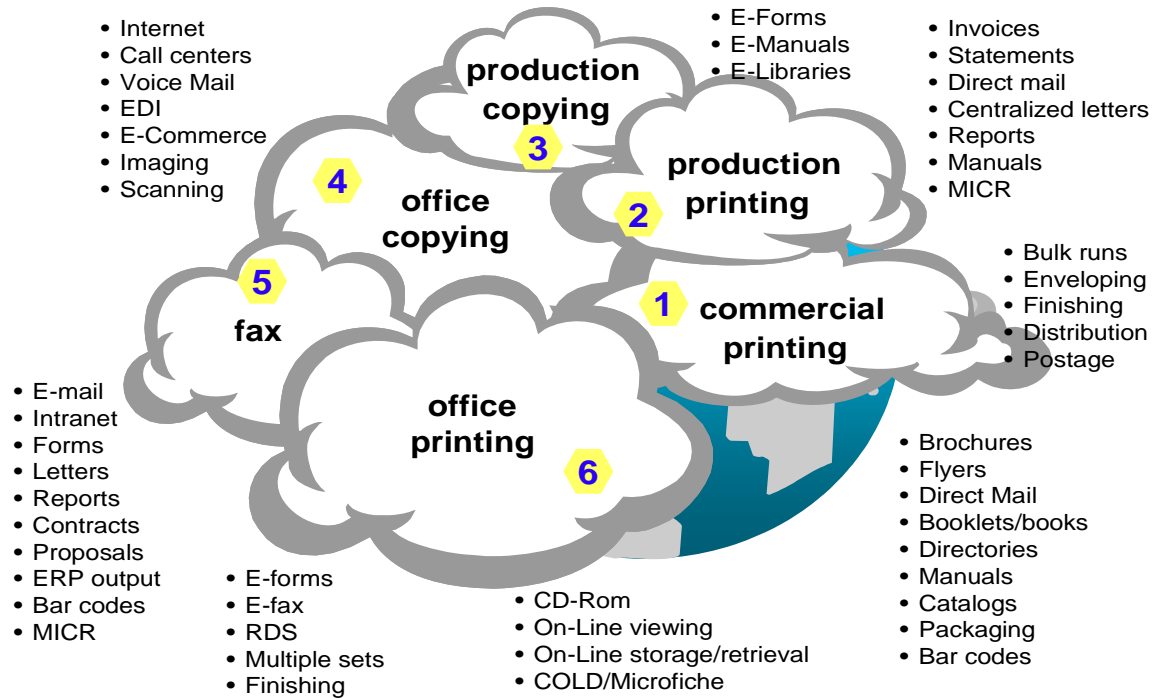
Documetrics

The second group of databases deals with Documetrics that describes the chain of interacting components that make up the overall document system. At the highest level, there are three major groups or silos: Commercial, Production and Office documents. These have then been broken down into six sub silos to reflect the different costs and activities that are involved in each.

1 The Standard Occupational Classification system was devised by the US Office of Management and Budget (OMB) and includes some 770 detailed occupations comprised in 22 major occupational groups.

2 The North American Industry Classification System (NAICS) was developed by the US, Canadian and Mexican governments to replace the outdated Standard Industry Code (SIC) system.

Commercial printing sub silo (1) includes flyers, ‘glossy’ brochures, marketing collateral, directories, annual reports, direct mail, booklets and packaging material, etc. Typically, professional printing and packaging firms undertake this type of work, using specialized commercial technologies such as lithographic print.



The high-volume production silos include production printing (2) and production copying (3). This work includes, for example, the central reproduction centers, mainframe printing centers or external outsourcing to service providers and mailing houses, dealing with output and management of applications such as billing and statements or bulk reports. Like commercial printing, the production environment is ‘driven’ by professionals in document assembly, management and related services.

Office documents make up the rest, where physical output is generated as: office copied pages (4) office facsimile pages (5) or office printed pages (6). Unlike commercial or production environments, the office document end-users comprise the broad range of occupations across a company who create, use and manage electronic and paper-based documents as part of their daily jobs. Paper output is generated on convenience photocopiers, multifunction devices, personal and networked printers, facsimile machines.

Each of these six sub silos of document costs have a different make up of components. Taking into account the evolving convergence between these historically discrete paper-based document silos and the continuous overlay of electronic and digital counterparts, we then broke each silo down to its components and mapped their interactions and individual costs in the table below:

EDAM® Office Document Components	
Visible Hard Costs – hardware & options, toner and inks, paper (plain and special), click-charges, break-fix, maintenance, power, etc.	4.4¢
IS Support and Infrastructure – help desk staff, 2nd level support, installation and setup, asset mgt., testing, training, print servers, network connections, application conversions, print formatting software, pre-processing equipment., etc.	5.0¢
Administration and Purchasing – product and services selection, internal requisitions, orders, billing, RFP’s, storage, restocking, supplies service centers, inventory management, vendor relationship management, etc.	2.8¢
Document Production – end user document creation, formatting, distribution time and effort, device intervention, document finishing, process and workflow interaction etc.	16.6¢
Document Management – the ‘before and after’ costs and processes, including scanning, filing, routing, indexing, storage, microfiche, COLD, retrieval, enveloping and, local mailroom, postage & distribution, pre-printed forms, electronic forms, waste disposal, etc.	31.6¢
Total Burdened Costs	60.4¢

The displayed costs are a highly reasoned estimate of aggregate and optimized costs for organizations of over 1,000 employees. These figures are intended to be used for general guidance discussion only. EDAM® is a registered trademark of ALL Associates Group, Inc.

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Similar systems maps for the component parts and burdened costs have also been developed for the production and commercial environments to reflect the different make up and distribution of costs.

Country-level Consumption Data

Alongside the Documetric databases, ALL Associates Group maintains countrywide consumption figures for business, education and public administration to match the components described in the previous table. This embraces around one thousand consumption and cost figures that range from paper, equipment and supplies costs to filing

cabinets, postage, and associated IT costs.

Where possible, we use three independent sources for each consumption data point to avoid reliance on only one source. Additionally, as the context and form of national data sets may not precisely map to the EDAM Frameworks, we apply proprietary statistical adjustment techniques to ensure that there is a consistent and comparable perspective in the use of the modeling tools. Consumption and costing data is updated on an annual basis to reflect changing market dynamics.

Actual Customer Data

In addition to the myriad of databases and source information from which ALL Associates Group extracts, analyzes and modifies EDAM data sets, we have also been able to compare our statistical results against actual data collected from over 800 major corporations and organizations to date.

This provides an ongoing test of the EDAM statistical approach and results in ongoing minor adjustments to our methodology that maintains integrity and stays relevant to underlying trends and technologies.

While client data is held in confidence, this ‘blind test’ against real data has demonstrated that the overall EDAM systems thinking and statistical thinking approach is robust.

Interconnecting input and mathematics

The next part of the EDAM process is to input minimal data that is easy to find and recognizable by everyone. The reason for this is simple. If the basic premise is that few organizations know what their own document system looks like – there is no point in asking for complex data that may be extremely difficult or time consuming to gather or even impossible to collect. This minimal data input can then be mathematically modeled against the two sets of core databases.

Input

As discussed earlier, we defined four basic input components:

Employment

This means fulltime equivalent (FTE) employees made up of fulltime and part time staff, plus an FTE equivalent for contractual or temporary staff.

This common metric of an overall FTE equivalent is important as companies may have different human resources policies.

Industry

ALL Associates Group primarily uses NAICS (North American Industry Classification System) to the four-digit level, to classify all economic activity. This approach identifies 315 industry classifications. For companies that operate in multiple industry classifications, then multiple NAICS codes are used as input together with an associated percentage of the total employees in each different classification.

By inputting any of these 315 industry classifications, EDAM can precisely model the specific occupational mix based on 770 standard occupation codes (SOC).

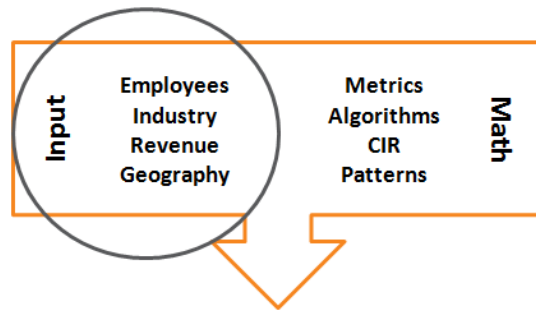
Revenue or Revenue Equivalent

In order to provide an economic ratio of document costs, a company’s gross revenue is used as an input metric. However, many organizations do not have a traditional revenue figure, so appropriate ‘revenue equivalent’ figures are used that will be applicable to the individual organization.

Geography

As many costs vary by geography, especially wages, this input allows EDAM to factor in the different costs demographically.

In addition, other country-by-country cultural differences affect document volumes and practices. Even simple issues such as paper sizes, weights and costs vary by country and region. Factoring in these variances is based on the geographical input.

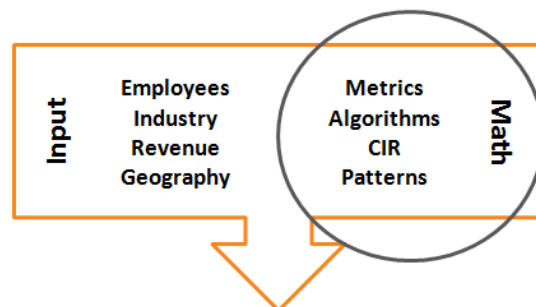


Mathematics

ALL Associates Group has developed a number of mathematical and statistical techniques based on tried and tested methods. These comprise four categories of analytics: Metrics, Algorithms, Causal Inductive Reasoning (CIR) and Patterns:

- **Metrics**

Using statistical techniques on the core sets of data, some 1,500 key metrics have been developed that provide a constant set of data points. Examples include pages per employee, average costs of documents as a

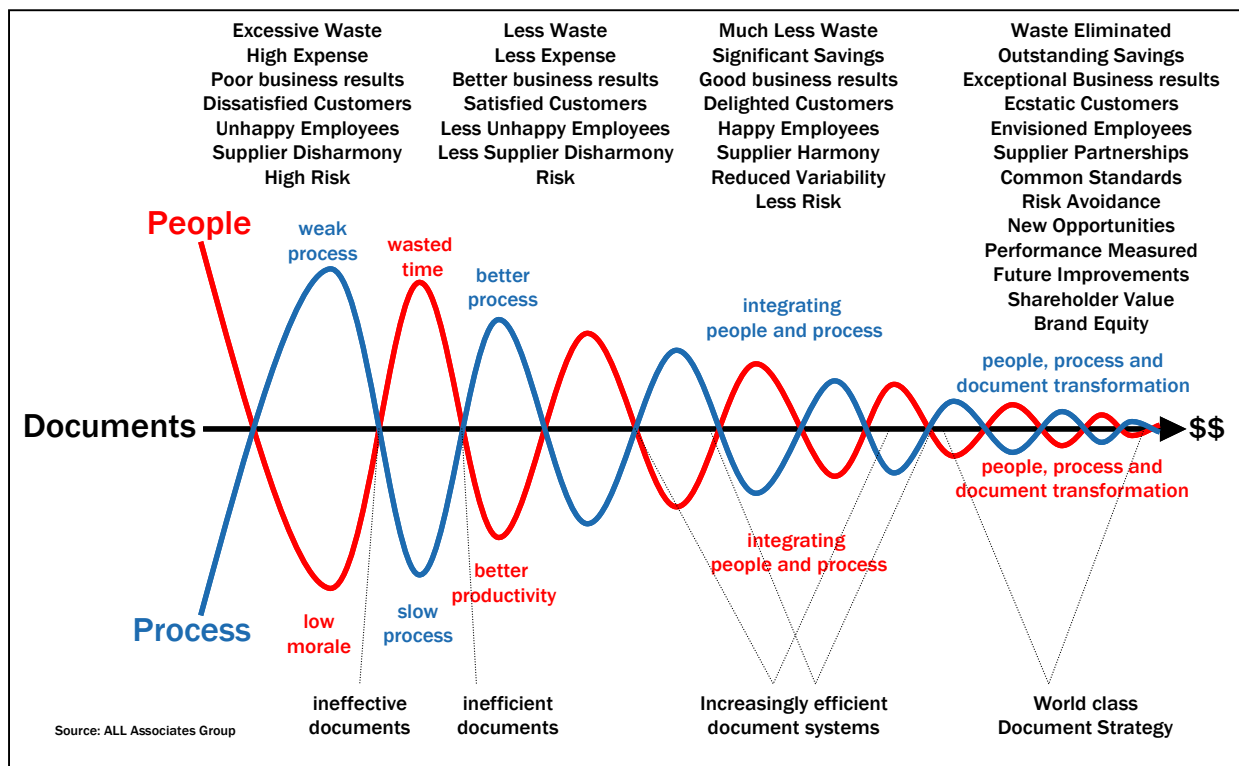


percentage of revenue by industry, etc.

- **Algorithms**
Using a set of proprietary algorithms (a set of ordered steps for solving a problem, such as a mathematical formula) the EDAM tools process the four basic inputs and interrogate the EDAM databases to return appropriate values for a specific company, industry or geography.
- **Causal Inductive Reasoning (CIR)**
Causal Inductive Reasoning is concerned with establishing the presence of causal relationships amongst events. Using these techniques to map complex interactions of the overall documents system helps to identify where events of one sort (the causes) are systematically related to events of some other sort (the effects). As a result, it may become possible for us to alter a process by producing (or by preventing) the occurrence of certain kinds of events.
- **Patterns**
Based on the year-on-year growth and annual updating of EDAM databases, patterns of consumption, behavior, technology change and regulation can be observed and act as a guide to potential future trends. Mathematical patterns are also used in the EDAM process to (i) measure the changing relationships between office, production and commercial document silos in relation to a company's size and industry type and (ii) identify key interrelationships between components of the document system that give rise to significant negative or positive impact to the whole.

Documents, People and Processes

Today, the bedrock of information and knowledge-flow is based on trillions of electronic and paper-based documents that flow through every business process. The 21st century document has taken on an omnipresent form and chameleon-like nature. Documents exist in multiple places and formats at the



same time. They constantly transform between electronic and physical states. Every organization has a critical dependency on these document systems, in both paper-based and electronic formats.

Despite the importance of documents, few companies or organizations have a truly holistic understanding of their own document system. The components are fragmented and managed in sub silos. This can lead to dysfunction and sub optimization, which means there is considerable waste and missed opportunities for value creation.

Even though there are thousands of ‘generic factoids’ about paper-based and electronic documents, they refer to specific parts or components. While the data points may be true...they each share a common deficiency. None of them deliver a reasoned predictive estimate of what the organization looks like today, and what it could look like in the future. This is the purpose of EDAM.

EDAM’s ‘systems thinking’ approach to complex documents environments illuminates the whole document system and the interactions between the various parts. Once understood, a World-class document system can be envisioned. This aids decisions on where to conduct in-depth assessments and ultimately implement the right document technologies to connect people and processes, creating exceptional business efficiencies and competitive advantage.

EDAM then resorts to ‘statistical thinking’ so that current and future states can be measured, quantified and monitored in a continuous improvement process. The following chart maps the progress to excellence.

Taking the Next Steps

The EDAM tools deliver the first step in a process of enlightenment. They provide a reasoned estimate of enterprise document costs and the scale and location of potential savings. The figures are no longer hidden from view and you now have something to validate.

Increasingly, leading companies are looking at the document system as a whole and reducing waste and increasing value at the same time.

The result has been to:

- Drive significant hard dollar savings
- Enhance environmental stewardship
- Develop easier document interactions for people involved in knowledge work and business processes – be they employees, customers or partners.

Conclusions

By removing barriers and taking a view of the whole...the potential synergies can be identified and quantified. This would deliver currently untapped savings. More importantly, it can drive business process improvements, enhanced productivity and enhanced brand equity.

Finally, by embracing a holistic approach in respect of your document environment, invaluable learning and insight can be gained about ‘systems thinking’ in general and then cross-pollinated to other operational phenomena.

The real focus for document systems is on:

1. Improving the processes that underpin the delivery of distributed output services;
2. Improving the people interaction with the processes;

3. Establishing the right infrastructure and support for distributed output;
4. Enhancing the presentation and delivery of information and knowledge;
5. Creating new revenue creating opportunities;
6. Creating a continuous improvement cycle and effective performance management measures;
7. Reducing the overall environmental impact.

Items 1, 2 and 3 need to focus on efficiency and cost avoidance, while items 4 and 5 should focus on effectiveness and value creation. Item 6 provides the proof. Item 7 provides additional savings, brand equity and is simply the right thing to do!

Additionally, the end-users and other stakeholders have to be presented with a credible proposal to change 'old habits' and 'buy-in' to potential changes in practice, process and procedures. This is where 'psychology' rather than 'technology' can help deliver the ultimate business benefits.



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