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PAPERLESS TECHNOLOGY AND PROCESS IMPROVEMENT WHITE PAPER

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ABOUT THE WHITE PAPER

Benefits of paperless technology can include dramatic increases in efficiency, quality, service, governance, compliance, and knowledge protection. Yet in spite of the above benefits, major industry studies find that the vast majority of organizations have made minimal progress towards becoming paper-free and a significant number have not even started yet. Conversely, many organizations have deployed paperless technology in an inconsistent bubble up fashion, without proper planning and have created serious operational, litigation, regulation compliance, and audit issues.

This paper will discuss: reasons, we at CRE8 Independent Consultants, believe are responsible for the delayed or incorrect implementation of paperless technologies and how the "process" of paperless technology planning, budget, implementation, and measurement can be improved through use of process improvement methods such as Continuous Process Improvement, Business Process Management, Re-engineering, LEAN, and Six Sigma. To illustrate these benefits, at the end of the white paper, case studies are presented and a high level end user planning checklist is provided. This white paper is updated as of 07/05/2015.

ABOUT THE AUTHOR

Mr. George J. Dunn, Founder and President of CRE8 www.cre8inc.com is a worldwide recognized consultant, speaker, instructor and author on business process innovation (Lean, Six Sigma, BPM, Re-engineering, CPI, TQM), paperless technology planning and computer system replacement planning. He holds certifications in numerous process improvement methodologies (TQM, BPM, LEAN, Six Sigma, Workflow) and has successfully designed paperless systems from 25 to over 25,000 users, across numerous vendor platforms. He has served in executive and leading roles with CRE8 Incorporated, GTE Corporation, Wang Labs, ASA International, and KPMG Peat Marwick. He is a past advisor to AIIM worldwide workflow standards committees, Director of Education/Board Member for numerous AIIM chapters, a presenter for worldwide AIIM webinars and a subject matter expert author/blogger for Document Strategy Forum, AIIM and ARMA.

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- paperless technology planning consulting www.cre8inc.com/consulting/paperless
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WHY IS PROCESS IMPROVEMENT IMPORTANT WHEN PLANNING FOR PAPERLESS TECHNOLOGIES?

Benefits of paperless technology can be outstanding including dramatic increases in efficiency, quality, service, measurement, and knowledge protection. Our studies have found that utilizing ECM (electronic content management) and workflow technologies; document access time, process quality, efficiency and customer service can improve 5% to 25%, a significant cost/benefit improvement proposition.

Yet if paperless technologies provide such a powerful tool to increase efficiency, quality, service and compliance why are organizations so slow to implement these technologies enterprise wide?

> Fact: An AIIM (Association of Information and Image Management) study found that the vast majority of organizations have made minimal progress towards process that could be paper-free and a significant number have not even started yet.

Conversely, I've been hearing a lot of unhappy comments from workers, frustrated with "shared group level" electronic content management (ECM) systems. Complaints include each group indexes documents differently and as a result they can't find needed documents. Records managers and general legal counsel weigh in with their own complaints, stating that these group level systems are deployed without a disposition/retention module (i.e., electronic records management) and are out of sync with the organization's records schedules, policies, procedures and governance.

> Fact: Magnify this situation by 2X to over 500X and you have the state of the union for many organizations, ranging in size from privately held to Fortune 100.

I believe the reasons for the slow or incorrect implementation of paperless technologies include:

- paperless technology abilities, benefits and risks are not fully understood,
- a well thought out, detailed enterprise plan does not exist,
- users are planning and implementing paperless systems without proper guidance from internal IT, records and governance groups; and external subject matter experts,
- vendors are not provided with a proper application design before they start implementation,
- return on investment is not being clearly and objectively articulated, consequently projects are not becoming funded initiatives, and
- resistance of staff and management toward deployment.

So how do we overcome these challenges? As an independent consultant specializing in the paperless technology industry for the past 25 years I believe "it's all about the process" the process of education, enterprise-wide planning, process/workflow/records management improvement, application design planning, implementation, and measurement.

To illustrate if an (a):

- enterprise wide paperless technology plan exists:
  - areas of the organization can be ranked as to benefit/cost,
  - a road map can be created,
  - projects can be categorized, planned and budgeted, and
  - initiatives can be approved and scheduled.
- workflow improvement plan exists, process:
  - baselines can be developed identifying current costs, risks, and noncompliance,
  - redesign goals can be established to meet organizational need (incremental to radical),
  - improvement methodology, technique and tools can be identified and deployed,
  - alternatives can be evaluated,
  - redesign return on investment can be calculated, and
  - procedural changes can be rolled out in advance or as part of the paperless technology implementation.
- records management plan exists:
  - records inventories, as required, can be conducted,
  - schedules, specifying retention and disposition rules, can be established /updated to provide consistent management of paper and electronic documents,
  - governance, policies, and procedures can be established,
  - enterprise and department coordinators can be identified, and
  - quality assurance audits, to ensure compliance, can be put in place.
- proper application designs exist (for each deployment):
  - business level requirements can be identified,
  - technical requirements can be documented,
  - change management requirements can be determined,
  - detailed project costs and ROI can be confirmed,
  - vendor solutions can be assessed, and
  - specific direction can be provided to the selected vendor.
- implementation plan exists:
  - a project plan is developed,
  - co-dependencies and risks are identified,
  - responsibilities are assigned,
  - change management strategies can be deployed,
  - acceptance criteria milestones are documented,
  - progress and completion is measured, and

    - vendor and internal staff can be held accountable for proper completion of the project.
- measurement exists:
    - baselines can be evaluated,
    - redesigns can be valued,
    - implementation success can be measured, and
    - on-going improvement can occur.

As the areas described above are quite broad and could require a book to address, I would like to focus this white paper discussion on four key areas:

1. A basic description of paperless technology abilities, risks and planning tips, for those new to paperless technologies or for those that have been using older systems.
2. An introduction to key process improvement methodologies including Continuous Process Improvement (CPI), Business Process Management (BPM), Re-engineering, LEAN, and Six Sigma.
3. Case study examples illustrating potential benefits of incorporating process improvement methodologies with planning for paperless technology.
4. A high level paperless technology and process improvement takeaway checklist.

DISCLAIMER AND COPYRIGHT

This white paper contains CRE8's understanding of industry studies, process improvement methods (CPI, BPM, Re-engineering, LEAN, Kaizen, 5s, Six Sigma, Fishbone Diagram) and paperless technologies (capture, recognition, digital signature, electronic content management (ECM), workflow and retention/disposition (ERM)). As there are many different definitions and books espousing process improvement methods and paperless technologies, and as methods and abilities can change; the reader should conduct research, beyond this white paper, to fully familiarize themselves with the specifics of the methodology and technology.

As planning for process improvement and advanced paperless technology's must to be tailored to the specific need of each organization, the information, case studies, and checklists provided in this white paper should be treated as an introductory. Case studies presented in this paper provide an illustration of how process improvement methods can be used in conjunction with paperless technologies. As actual results will vary, based upon an organization's unique needs, results stated in case studies are "examples only" and should not be relied upon.

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INTRODUCTION TO PAPERLESS TECHNOLOGIES.

This section provides a definition of paperless technologies modules, risks, planning tips and overall planning considerations.

Modules
Although there are many types of paperless technology modules the most common include: capture, recognition, digital signature, electronic content management (ECM), workflow and retention/disposition (ERM). These modules can be deployed separately, as an overall system and may be hosted in different ways such as internal, private cloud, or public cloud.

Module deployment risks include: organic growth without an overall enterprise plan, vendor selection without first comparing vendor abilities to detailed application requirements, workflow implementation without cleaning up/improving processes, vendor contract and internal SLA agreements not detailed enough to hold vendor and internal resources accountable, record retention/disposition schedules not being updated and simplified before setting up ERM, and lack of clear success criteria.

> Tip: Develop a conceptual application requirement (CAR) document including workflow maps previous to evaluating a vendor's production. A CAR is not a list of technology features and functions, it is a well written narrative of how the selected area, using these technologies, will function from a business perspective. Assess vendor capabilities against written requirements.

Capture modules provide the software to scan documents to electronic formats (e.g. TIFF, PDF) and to index these documents. Scanners can include: simple desktop, medium duplex departmental and high speed. Scanners can be implemented in a distributed or centralized fashion. Indexing of the documents can be manual or automated through character recognition.

Scanner deployment risks include: incorrect scanner placement, improper QC of scanned image and indexes, scanning job responsibilities not established ahead of implementation and backfile conversion not properly assessed/planned.

> Tip: When selecting scanner(s) it is important to identify the sheet feed speed (PPM), feed tray ability (number of pages that can fit in the sheet feeder), how often the scanner will jam, sides scanned (simplex, duplex), color scan ability, and QC re-scan ability as compared to the needs of organization.

Recognition Modules provide the ability to automatically capture index information from barcodes, full text, selected text, codes, and handwriting; from a scanned document. Barcodes can be used to separate documents when scanning (dummy barcode sheets); or be pre-printed with index key information such as form type or customer number.

Recognition deployment risks include: not anticipating the manual labor required to correct non recognized indexes.

> Tip: When evaluating recognition software it is important to assess the recognition accuracy, for the "types" of documents the organization will be scanning as characters "not properly recognized" will need to be manually verified.

Signature Modules allow for authorization of electronic documents using annotation, digital signature, or pin code. Annotations include those drawn on the face of a document using a finger, mouse, or electronic pen. Digital signatures include validation of signature itself such as the speed and pressure when writing; against a master file. Pin codes can be used to authorize a document or place a signature on the document.

Signature deployment risks include: users not convinced that electronic signature will be acceptable and software selected not being able to properly authenticate signature on older document formats.

> Tip: Special attention needs to be placed on authorization of native document formats, such as word processing, spreadsheet, and presentations, to ensure that if the document is altered the signature is no longer valid.

Electronic Content Management (ECM) modules provide storage, security, view, and output of electronic content (documents, text, video, voice). Documents stored in ECM originate from scanners, email, shared network drives, data systems, and created through use of applications. As documents are used or analyzed, additional indexes such as version number, author, or other information can be added to the document. Content security can be established at the document, user, group or enterprise level to control access and rights.

ECM deployment risks include: non standardization of indexes; not including indexes important for audit, compliance, or discovery; and not integrating ERM (Electronic Records Management) to ECM. Without integration to ERM it will be difficult to associate retention schedules and disposition with documents stored in an ECM system.

> Tip: When designing an ECM system consistency of viewers, indexing/search and data system integration need to be confirmed for related application areas and access devices (desktop, laptop, mobile). Other important considerations include access speed, version control, and security.

Workflow modules allow for the routing of work packets for view, analysis, approval, or output. A work packet can contain data, document(s), video(s) and voice. Workflow routing may be based upon individual user decision and/or pre-set routing rules. Routing can be sequential or in parallel.

Workflow deployment risks include: implementation of workflow without first cleaning up and improving underlying processes, not involving users in the development of workflow patterns, over/under design of workflow, believing that graphical workflow tools mitigate the need to define/improve process ahead of implementation, and using workflow to develop a data application that could be purchased off-the-shelf.

> Tip: Before implementing workflow it is beneficial for the "detailed processes" supporting the workflow to be baselined, cleaned up, and realigned (to illustrate, see introduction to process improvement methodologies and case study sections of this white paper). Also, when overlaying workflow on top of a process the overlay should be at the correct level to provide effective routing and measurement (for example, not too detailed or too general).

Electronic Records Modules (ERM) provides retention rules and disposition of documents stored in the ECM system, based upon attributes such as record series, close date and retention period. Some ERM modules allow for legal holds or will prevent disposition of a document if it is accessed close to its disposition date. ERM is different from e-discovery software (not addressed in this white paper).

ERM deployment risks include: Non-integration of ERM to ECM, waiting to deploy ERM, and not involving records managers and general legal counsel in a discussion of ERM requirements.

> Tip: Before setting up ERM record inventories, schedules, policies, procedures and governance need to be updated.

INTRODUCTION TO PROCESS IMPROVEMENT METHODOLOGIES.

Over the years there have been many process improvement methodologies introduced and used. Five popular methods include:

- Continuous Process Improvement (CPI),
- Business Process Management (BPM),
- Re-engineering,
- LEAN, and
- Six Sigma.

Although there are similarities between these methodologies, each method has contributed unique ways to look at a process, ideas and tools. As there are many different definitions and books, espousing each methodology, enclosed is our best general, understanding of each. To obtain a more specific definition the reader should conduct its own research and consult internal / external experts in each field.

Continuous Process Improvement (CPI) is an ongoing "never ending" effort to improve people, processes, and systems. CPI is focused on incremental improvements over time where processes are constantly evaluated and improved verses a single large improvement event. CPI focuses on everyone working together from senior management to workers to identify how to improve the process instead of placing blame. W. Edwards Deming, a pioneer of the field, saw CPI as part of the 'system' whereby feedback from the process and customer were evaluated against organizational goals.

Some use a Kaizen event (improvement) as part of CPI which is a method made famous by book of Masaaki Imai "Kaizen: The Key to Japan's Competitive Success." Kaizen teaches people how to perform experiments on their work using scientific method, identifies how to learn to spot and eliminate waste (unnecessary work) in business processes, encourages continuous improvement to eliminate all waste and is used when appropriate (need for solution is urgent, big impact projects).

> CPI Tool: Hold a one day Kaizen event. The event should include the following actions: develop agenda (preparation), training on methods and tools, document current processes, brainstorm a redesign state, developing a follow-up plan, and present results and celebrate successes. See white paper appendix for a case study example.

Business process management (BPM) focuses on innovation and flexibility through examination of procedural change, technology changes and process optimization. BPM steps include:

- Vision – Strategize,
- Define – Baseline "step / task level" current process,
- Model – Identify redesign options using process and technology,
- Analyze – Select best redesign,
- Improve – Identify / implement,
- Control – Dashboard / measure, and
- Application Design (changes / new system).

Business process management (BPM) has been referred to as a "holistic management" approach to aligning an organization's business processes with the wants and needs of clients. BPM uses a systematic approach in an attempt to continuously improve business effectiveness and efficiency while striving for innovation, flexibility, and integration with technology.

> BPM Tool: BPM boundary assessment. Draw a box around the outside of a defined process. Identify who provides input to the process (supplier, customer, other departments), who receives the output of the process (customer, other departments), and who needs access to information (e.g. Audit, Legal). Interview parties identified to see how the process or the product/service produced is serving them and what level of change/improvement is need, from their perspective This will provide one of the destinations to navigate the BPM process redesign towards.

Re-engineering according to experts Michael Hammer and James Champy, is the "fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed. Re-engineering asks the question "why are we doing this at all" and encourages leaps forward, not incremental change. Re-engineering assumes the majority of process steps and structure are non-value added and encourages an organization to toss out everything and start over with a brand new picture.

Reengineering starts with a high-level assessment of the organization's mission, strategic goals, and customer needs. Basic questions are asked, such as

- Does our mission need to be redefined?
- Are our strategic goals aligned with our mission?
- Who are our customers?

An organization may find that it is operating on questionable assumptions, particularly in terms of the wants and needs of its customers. Only after the organization rethinks what it should be doing, should it go on to decide how best to do it.

> Re-engineering Tool: Fresh sheet of paper. Forget about the current process, staff, and systems in place. Individually or in a group vision out if you were starting this process today how should it function. What staff/groups need to be involved in the process? What are the goals of the process? Should the process exist? See white paper appendix for a case study example.

LEAN made popular by Toyota focus primarily on reduction of Muda (waste) to improve value to the customer. Muda is a Japanese term for effort that is unproductive. The seven wastes include:

- Transportation – when a product/information is moved it can be damaged, lost, delayed and additional cost can be incurred that does not result in value to the customer.
- Inventory – requires capital outlay by the customer or the manufacture.
- Motion – Damage resulting from transportation through the manufacturing process or injury to workers.
- Waiting – Time spent waiting for a product/service during transportation or processing.
- Over- processing – Additional work is done on a product/service than is desired by the customer.
- Over – production – Product /service produced that is more than the customer requires.
- Defect – Rework or rescheduling.

LEAN is founded on the belief that waste can be eliminated and asks the question does the process step provide value from the customer perspective. Typically LEAN is best deployed within a comprehensive process improvement framework such as Six Sigma or BPM.

One important LEAN tool is the development of a value stream map (VSM). A value stream focuses on identifying value from customer standpoint (pull production) versus the organizations point of view (push production) and identifies ways to seek perfection. Value is defined by what the customer is willing to pay. See white paper appendix for a case study example.

> LEAN VSM Tool: Identify a process to be improved. Identify the time and cost required to produce the end result (product / service). Add in the margin desired to the cost. Ask your customers (internal or external) what time/price they are willing to pay in today's market. Determine the level of change necessary in the process and supporting costs to accommodate what the customer is willing to pay.

Another LEAN tool is 5s a workplace organization method that describes how to promote efficiency and effectiveness in a work space. Terms include: seiri, seiton, seiso, seiketsu, and shitsuke. English translation of these terms are sort (keep what is required), set (in order), shine, standardize and sustain (discipline maintain established procedure).

Additional 5s terms can include safety, security and satisfaction. 5s can be a foundation for process improvement. Just a few example 5s workplace areas can include: QC areas, record storage areas, hospital operating rooms, warehouses, desks, client reception areas, conference rooms and restaurants.

> LEAN 5s Tool: Identify a work space to be improved. Step 1 sort through items to identify those that are not used. Determine if these items should be moved to a central location or be discarded. Step 2 straighten or foot print each item (identify where it should be placed) to promote efficiency. Step 3 clean and test all items in the workplace on a daily basis. Steps 4 develop an action plan to sort, straighten and clean/test the workplace on a consistent basis. Assign responsibilities and accountability. Step 5 sustain the 5s method through training and visible promotion (posters, newsletters, weekly discussions).

SIX SIGMA is based upon work by Shewhart and Deming (post WWII Japan), further developed by Motorola in 1980's and made popular by Jack Welsh at GE in 1995. Six Sigma focus on improving quality of process by identification and removal of the cause of defects and reduction of variability. Six Sigma uses statistical methods and relies on use of trained Green Belts and Black belts who are trained internal and external experts. Six Sigma goals towards 99.99966% of the products manufactured to be statistically free of defects (3.4 defects per million). See white paper appendix for a case study example.

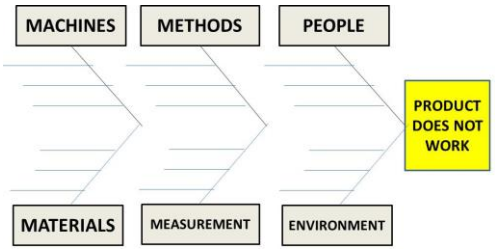
Six Sigma follows Deming's Plan-Do-Check-Act Cycle. Or DMAIC ("duh-may-ick") which has five phases.

1. Define problem, voice of customer, and project goals.
2. Measure key aspects of current process. Collect data.
3. Analyze data to understand and verify cause – effect relationships. Seek out root causes of defect.
4. Improve / optimize current process. Set up pilots.
5. Control future state. Make sure future state deviations are corrected before they result in defects. Monitor.
6. Recognize (optional) at beginning. RMAIC

One Six Sigma tool used to identify cause of defects is a Fishbone Diagram (FD) (AKA Ishikawa herringbone, cause-and-effect diagrams) created by Kaoru Ishikawa in the 1960's which help to

identify the causes of an event. Manufacturing categories include: People, Methods, Machines, Materials, Measurements, and Environment.

Six Sigma Tool: Identify a product (or service) that is experiencing defects. Using a Fishbone Diagram work with team members to brainstorm possible root causes for the defect (e.g. why the product (or service) does not work) using the categories of machines, methods, people, materials, measurements, and environment.



Alternative categories (for government), for a fishbone diagram could include: Policy, Worker, Methods (Processes), Suppliers, Customers, and Machines (Computers).

Many organizations train and utilize staff in Six Sigma based upon belt levels. Black belts receive extensive training/certification testing and are responsible for leading projects. Green belts assist Black belts with analysis and data collection and are certified through intermediate training/testing. Yellow Belts receive basic training/certification and participate as team members in the project. White Belts are instructed in the basic concepts of Six Sigma.

How do you decide which process improvement methodology is right for your project? All process improvement methodologies bring something to the table. Sometime a specific tool or method will work, other times a combination works best. The process improvement methodology and tool set for your project should be selected based upon the process improvement goals.

Process Methodology Identification Tool: Identify the overall time, cost, service and defect associated with the current process and compare this to what is being expected by the customer. Identify level of change required. If a dramatic level of change is required look at a Re-engineering. If the process is complicated with numerous process and technology interdependencies consider BPM. If defects are the issue a Six Sigma may be the choice. If process waste is the issue, examine LEAN. Alternatively a mixture of above methods/tools may be the correct choice.

CONCLUSION

I hope that this white paper has been beneficial in providing an introductory description of paperless technology and key process improvement methodologies. To provide examples of how combining these two areas can be valuable, Appendix 1 provides four case studies indicating how:

- A Kaizen event helped an organization significantly improve its approach to planning for paperless technologies,
- LEAN and Digital signature resulted in a 79% reduction in process steps and reduction of transport time from 2 days and 4 days to ½ day,
- Six Sigma and ECM reduced product / service cost by 14.75% and provided significant reduction in organizational defects, and
- Re-engineering and workflow reduced cost by 20%, product/service completion time by 37%, and customer service response time by 80%.

In addition, to further help you in your journey a high level takeaway checklist is provided in Appendix 2. Feel free to share your experiences via email and let me know if we at CRE8 Independent Consultants can be of assistance to your organization. We provide both on-site and web based, paperless technology and process improvement, planning and educational services.

Very Best
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APPENDIX 1

Case Studies

So how can paperless technology planning/deployment and process improvement methods be used together? To provide examples, the following four case study examples are presented 1) Kaizen and Paperless Technology Planning, 2) Lean and Digital Signature, 3) Six Sigma and ECM, and 4) Re-engineering and Workflow.

1. CASE STUDY – KAIZEN AND PAPERLESS TECHNOLOGY PLANNING

This case study discusses how an organization's current approach to planning for paperless technologies was assessed and improved in a Kaizen event.

- **Case Study Background**
  Over the past 10 years, an organization, implemented fifty three, different paperless technology installations: one enterprise application installation, two departmental installations (application level) and fifty minor implementations (shared group level). The organization is currently considering adding a cloud based ECM for post processed records. Overall 40% of the organization records are stored in the current ECM systems. The systems are supported by three different software vendors, two integrators, and internally. None of the ECM systems have an ERM (retention/disposition) module installed.

- **Kaizen Agenda**
  The agenda included a discussion of the current process of planning for paperless technology and brainstorm of a redesign planning state. Invitees included departmental managers, IT Director, organizational records manager, and a representative from the General Legal Counsel. The Kaizen event was led by an independent consultant.

- **Current process definition**
  The group identified the following issues/challenges with the organization's current paperless technology planning and implementation process.
  - There is no organizational plan for paperless technology.
  - The enterprise ECM system had a cost overrun of $600K and took six months longer than expected to implement.
  - Detailed application design requirements, for the departmental ECM systems, were not clearly defined ahead of vendor starting implementation. Records schedules were not simplified before populating the ERM module. Users are not happy with how one of the ECM system works.
  - The fifty separate shared group ECM systems had no formal design or implementation process. IT have users a manual, minimum training and a pat on the back. When setting up these systems, users duplicated issues and errors

from shared network drives and email systems to their ECM systems. None of these systems are integrated to an ERM module.
  - Users are left to their own decisions regarding when to dispose of paper and electronic records. As such, disposition of electronic records is not in accordance with organizational records retention/disposition schedules. IT is attempting to compensate by keeping a copy of all emails permanently archived, causing duplication and additional records too not be kept in accordance with their schedules.
  - Sixty percent of the paper received electronically are printed back to paper, after input to the ECM system, so documents can be routed manually or placed on to-do piles.
  - Requests to access records are growing rapidly by customers, regulators, and e-discovery requests.
  - Paper and electronic record disposition is inconsistent.
  - There was a recent breach where documents on a major shared network drive were deleted.
  - The records manager is looking forward to early retirement.

- **Brainstorm a redesign state**
  The group identified the following desired redesign or to-be state.
  - An enterprise plan will be developed. The plan will be based upon an analysis of departments, workgroups, and processes and will contain an inventory/ranking of all areas. A 10 year plan and yearly budget will be established.
  - A standard application design and budget request checklist will be followed by all groups. Processes will be redesigned and cleaned up previous to workflow design. Application / workflow requirements will be reviewed for completeness, accuracy and innovation, before they are released to the vendor for assessment.
  - A two vendor strategy will be established going forward, one vendor for major complicated process areas, the other for workgroup projects and collaboration.
  - All ECM systems will link to one ERM system.
  - Records schedules will be brought up to date and followed consistently for paper and electronic records.
  - Projects will be measured for compliance with planning and implementation goals. Issues and successes will be identified and measured.

- **Implementation after meeting (Result)**
  The following was implemented after the Kaizen event.
  - Five days, IT to stop deployment of any new shared group level systems.
  - Thirty days, engagement of outside expert to assist with planning, education, consulting and establishment of standards.

- Sixty days, inventory of current ECM systems, assessment of success/issues and renegotiation of support costs.
- Ninety days, completion of enterprise wide plan, identification of 10 year budget, and list of top 10 projects.
- One hundred twenty days, training of internal project managers on a standard application design checklist, workflow mapping and review process. Selective training of project managers in BPM and Six Sigma/LEAN methods.
- One hundred thirty days, completion of a records governance plan, policies, procedures, and organizational records schedule.
- One hundred and fifty days, application design for single organizational ERM system; and establishment of department record mangers for physical records.
- Two hundred days, implementation completed for 1 new major ECM/Workflow system and 5 new workgroup solutions, all coordinated in terms of application design, index, file format and integration to ERM; with each system showing 99% or better completion to acceptance criteria.
- Two hundred fifty days, full review and as applicable modification / consolidation of older shared work ECM systems (50).
- And so on.

- **Follow up Plan**
  Every six months a follow up audit of current paperless technology costs and avoidance costs. Follow up Kaizen event in one year.

2. CASE STUDY – LEAN AND DIGITAL SIGNATURE TECHNOLOGY

This case study focuses on an analysis of an organizational contract signature process using LEAN identification and elimination of process wastes including transportation, inventory, motion, waiting, over-processing, over-production and defect (Rework or rescheduling).

- **Case Study Background**
  An organization contract signature process involves a mixture of manual, automated, paper and electronic steps. A baseline of the process showed 43 steps (17 happy path steps – doing it right the first time and 26 unhappy steps – rework). 37 steps indicate some form of waste as defined by LEAN, including waiting time. The time to complete the happy path is 2 days and the time to complete the unhappy path is 4 days.

	STEPS	PATH	LEAN WASTE	DAY
1	Create document	Happy		1
2	Print document	Happy	Un-Automated	1
3	Walk to printer	Happy	Transport	1
4	Walk back to desk	Happy	Transport	1

5	Sign document	Happy		1
6	Make a copy	Happy	Un-Automated	1
7	File	Happy	Un-Automated	1
8	Overnight document	Happy	Transport	1
9	Open overnight packet	Happy	Un-Automated	2
10	Approve document	Happy		2
11	No do not approve document	Unhappy	Waiting	2
12	Write note on sticker	Unhappy	Waiting	2
13	Overnight back	Unhappy	Transport	2
14	Open overnight	Unhappy	Waiting	3
15	No sticker does not fall off	Unhappy	Waiting	3
16	Adjust document	Unhappy	Waiting	3
17	Yes sticker falls off	Unhappy	Defect	3
18	Call approver	Unhappy	Defect	3
19	Document approved	Unhappy	Waiting	2
20	Sign document	Unhappy	Waiting	2
21	Make a copy	Unhappy	Waiting	2
22	File	Unhappy	Waiting	2
23	Overnight document	Unhappy	Transport	2
24	Open overnight	Unhappy	Waiting	3
25	***Approve document***	Happy		3
26	Not approve	Unhappy	Defect	3
27	Write note on sticker	Unhappy	Defect	3
28	Copy	Unhappy	Defect	3
29	File	Unhappy	Defect	3
30	Mail Back	Unhappy	Transport	3
31	*Mail shows up on time*	Unhappy	Defect	4
32	*Not show up on time*	Unhappy	Defect	4
33	*Panic*	Unhappy	Defect	4
34	Call approver	Unhappy	Defect	4
35	***Yes show up on Monday***	Unhappy	Waiting	4
36	**Approve document**	Unhappy	Waiting	4

37	Open document	Unhappy	Waiting	4
38	**Yes approve document**	Happy		3
39	Sign document	Happy		3
40	Make a copy	Happy	Un-Automated	3
41	File	Happy	Un-Automated	3
42	Overnight document	Happy	Transport	3
43	File (Complete)	Happy	Un-Automated	3
43		**17 Happy**	**37 Wasted**	**2 Days Happy**
		26 Unhappy	**Steps**	**4 Days Unhappy**

- **DIGITAL SIGNATURE PROCESS REDESIGN**
  Utilizing digital signatures and LEAN process improvement (technology to eliminate waste and elimination of unnecessary signatures) the redesign shows 15 steps (8 happy path steps – doing it right the first time and 7 unhappy steps – rework). The time to complete the happy path is 1 day and the time to complete the happy path is within the same 1 day.

	STEPS	**PATH**	**LEAN WASTE**	**DAY**
1	Create document	Happy		1
2	Sign document	Happy		1
3	Email	Happy		1
4	Approve document	Happy		1
5	Not approve document	Unhappy	Defect	
6	Type Note	Unhappy	Defect	1
7	Adjust document	Unhappy	Defect	1
8	Document approved	Unhappy		1
9	Sign document	Happy		1
10	Email	Happy		1
11	*Approve document*	Happy		1
12	Sign document	Happy		1
13	Not approve	Unhappy	Defect	1

14	Type note	Unhappy	Defect	1
15	Email	Unhappy	Transport	
15		**8 Happy**	**6 Wasted**	**1 Day Happy**
		7 Unhappy	**Steps**	**1 Day Unhappy**

- **RESULT**
  Utilizing digital signature technology and process improvement (LEAN) process steps are reduced from 43 to 15 (65%). Transport time in best case (happy path) is reduced from 2 days to 1 day and for worse case (unhappy path) from 4 days to 1 day.

3. CASE STUDY - SIX SIGMA AND ELECTRONIC CONTENT MANAGEMENT (ECM)

This case study focuses on an analysis of an organizational electronic and paper document storage utilizing the five phases of Six Sigma Deming's Plan-Do-Check-Act Cycle or DMAIC: Define problem, voice of customer, and project goals. Measure key aspects of the current process. Analyze data to understand and verify cause – effect relationships and seek out root causes of defect. Improve / optimize current process. Control future state by making sure future state deviations are corrected before they result in defects and continue to monitor the process.

Case Study Background. What is the problem, voice of customer, and project goals? An organization receives documents via email. The recipients of the documents, at will, copy emails and attached documents to the shared network drive, re-forward documents via email, and/or delete their copy of the document. Users create and share documents stored in the network drive. At a user specified time, typically when the work is complete, the documents are printed out, deleted, and placed in a paper folder for archive.

- **Problem (as defined internally)**
  - Although there have been several individual initiatives, over the years, current systems are siloed in different areas of the organization.
  - ECM systems handle a small part of document management.
  - Primary organizational document management is still handled by email, shared network drives, and paper.
  - When employees leave the organization their mail boxes are deleted by IT without regard to retention/disposition policies.
  - Paperless technology initiatives have not become mandated. Major funding for paperless technologies has not occurred as other priorities have taken priority.
  - Electronic records are not being disposed of in accordance with the dates specified in the records schedules.

- **Problem (Voice of the customer)**
  - Related departments (internal customer) cannot find all the documents they need to perform their job correctly.
  - All internal customers can't effectively track process progress based upon email communication. Inconsistently, email reply to all, reply to one, and no reply occur.
  - To keep 20% of its customers the price for the organization's product/service must be reduced by 6%, over the next two years.

- **Project Goals**
  - Reduce document management defects (indexing, storage, access, tracking and disposition errors) to zero,
  - Align electronic records with paper records (management and disposition),
  - Expand records manager oversight to include electronic records,
  - Reduce cost of e-discovery by 5%, and
  - Reduce cost of producing product/service by 6%.

What are the key measurement(s) of the current process? What defects exist?

- Email defects
  - 40% of emails are deleted based upon personal preference of the user,
  - 10% of the email attachment(s) are not copied to the shared network drive,
  - 85% of emails (text) are not copied to the shared network drive, and
  - 100% of all emails are deleted, by the I.T. group 5 days after an employee leaves.

- Shared network defects
  - 90% of documents are not indexed within word-processing and spreadsheet applications,
  - 80% of documents stored on the shared network drive are not recognizable by the document "save as" description, and
  - 75% of document cannot be accessed within an acceptable time (2 seconds electronically, 5 minutes for paper on-site, 4 hours for paper stored off-site).

- E-discovery defects
  - 90% of documents cannot be identified by key indexes, and
  - 35% of documents identified for analysis during e-discovery could have been avoided if documents were disposed of at the time specified in the organizations approved records schedule and previous to any legal hold requirement.

- Costs
  - When there is an issue during processing, related documents need to be touched (routed, analyzed, approved) numerous times, resulting in additional overall product/service cost of 12%,
  - During processing it takes additional time to find documents stored in existing current document management system (email, shared network drives, paper on-site, and paper off-site) verses an ECM system, resulting in an additional 8% of product/service cost,
  - Duplicate copies of documents are stored electronically and in on-site /off-site storage, resulting in an additional 1% of product/service cost, and
  - Additional discovery review of documents (35%) is required, as these documents are not disposed previous to legal hold requirement and in accordance with the date specified in records schedule, resulting in increased e-discovery cost of 5%.

Analyze data to understand and verify cause – effect relationships. Seek out root causes of defect.

- Root causes
  - All documents are not stored in one place, accessible electronically, indexed correctly or consistently, and disposed of in accordance with approved records schedule (for documents with no legal holds), and
  - Higher than necessary costs are caused by incorrect information provided in the beginning of the process, unnecessary "non-value" steps during processing, and numerous un-automated document management systems.

Improve / optimize current process (actions/results)

- Deploy electronic content management (ECM) including electronic records management (ERM) using an enterprise plan,
- Utilize Six Sigma process improvement techniques and update of records (schedules, policies, and governance) to accomplish significant defect reduction (see email situation and application/shared network drive situation),
- Reduced costs by 19.75% (product cost 6%, costs to find documents 8%, document storage cost .75%, and e-discovery cost by 5% (see e-discovery situation). This is 13.75% lower than requested by customers (adding to profitability of company) and
- Reduced defects/costs as follows:

	CURRENT DEFECT	NEW DEFECT USING ECM, WORKFLOW AND ERM
EMAIL		
Emails are deleted based upon personal preference of the user.	40%	0%
Email attachment(s) are not copied to the shared network drive	10%	0%
Emails (text) are not stored in the shared network drive	85%	0%

Emails are deleted, by the I.T. group 5 days after an employee leaves	100%	0%
APPLICATION / SHARED NETWORK DRIVES		
Documents are not indexed within the native application such as word-processing and spreadsheet	90%	0%
Documents stored on the shared network drive are not recognizable by the "save as" document description	80%	0%
Document cannot be accessed within acceptable time (2 seconds electronically, 5 minutes for paper on-site, 4 hours for paper stored off-site	75%	0%
E-DISCOVERY		
Documents cannot be identified by key indexes	90%	0%
Discovery of additional documents due to failure to dispose of those documents in accordance with the date specified in approved records schedule and previous to legal hold requirements.	35%	0%
COSTS DEFECTS		
Additional, overall product cost, to route, analyze, and approve documents when there is a process issue.	12%	6%
Additional cost to find documents in existing document management systems (email, shared network drives, paper on-site, paper off-site) vs. an ECM system.	8%	0%
Additional cost to store documents in two places (electronically, and on-site /off-site storage).	1 %	.25 %
Additional e-discovery cost due to failure to dispose of documents in accordance with the date specified in approved records schedule and previous to legal hold requirements.	5%	0%
	26%	6.25%
		-19.75%

Control future state. Make sure future state deviations are corrected before they result in defects. On-going analysis to identify, understand and improve defects.

4. CASE STUDY – RE-ENGINEERING AND WORKFLOW

This case study focuses on an analysis of Workflow (email and paper) from a Re-engineering perspective using the following six questions to facilitate fundamental rethinking and radical redesign: what dramatic improvement is required, what is the current situation, what leaps forward (not incremental change) are required to support dramatic improvements, forgetting about the current process, how should the new process will function, and what is the result of the organization utilizing Re-engineering and Workflow technology.

- **Case Study Background**
    - **What dramatic improvement is required?** Market studies show a 20% reduction of product/service cost, over the next two years, is required to keep 40% of the

organizations clients. The organization has decided it is their best interest to keep these customers.

- **What is the current situation?** Daily, 2 million emails are received, thirty percent are deleted, seventy percent (1.4 million) are reviewed and placed in email folders, and 490 thousand are forwarded. Issues include:
  - Employees inconsistently reply, forward, maintain, and delete emails/attachments,
  - A hundred thousand emails daily are printed and placed in to do piles,
  - Between re-forwarding and replying a single email / paper document, including attachment, can be multiplied 10 to 250 times,
  - It is difficult to find out what has actually happened and impossible to track the status of the transaction without talking to staff, and
  - Emails are the favorite target of compliance audits, discovery, regulatory investigations, and the press.

- **What leaps forward (not incremental change) are required to support dramatic improvements?**
  - All internal e-mail routing and manual processes will be replaced with workflow,
  - Staff will be assigned to workflow tasks,
  - Shared network drives and email folders will be replaced by ECM and ERM.
  - Immediate workflow tracking and measurements will be put in place, and
  - All organization management and measurement will shift from department/group based to process based.

- **Forgetting about the current process, the new process will function as follows.**
  - Except for external receipt and output, **r**outing of documents in email will be stopped,
  - Documents will no longer internally be forwarded in paper,
  - As needed, existing paper documents will be scanned,
  - Work-packets will be hyperlinks to content stored in electronic content management (ECM),
  - Content will be routed through structured workflow patterns and only when required unstructured routing will be allowed,
  - Approvals will be indicated within workflow and where required through digital signature technology,
  - To support on-screen viewing of numerous content and data screens, employee's desks will be equipped with three side by side flat screens, and
  - Retention / disposition will be controlled through the ERM system.

- **What process steps and structure will be eliminated (non-value added) to meet required improvements?**
    - As result of Re-engineering and Workflow technology, 25% of unnecessary / unstructured email and paper process steps will be eliminated, and
    - Additional quality control routing and decision structure will be added.

- **What is the result of the organization utilizing Re-engineering and Workflow technology?**
    - Organizational product/service cost will be reduced by 20% allowing the organization to keep 40% of its customers,
    - Product/service completion time will be reduced by 37.5%,
    - Customer service response time will be reduced by 80%, and
    - Quality controls will decrease issues with product/service, audit, and litigation.

APPENDIX 2

TAKE AWAY HIGH LEVEL PAPERLESS TECHNOLOGY AND PROCESS IMPROVEMENT CHECKLIST		
	ITEM	**CHECKLIST**
1.	Select an external paperless technology and process improvement facilitator / project manager.	The external facilitator/project manager should be: • independent of the process and vendors, • experienced in process improvement methods, tools and deployment, • experienced in paperless technology studies, design, and implementation, • bring an understanding of industry best practices and vendor abilities, • express objectivity when working with teams to develop studies, application designs, process/workflow improvement, and ROI assessment, and • assist in the facilitation of change, vendor analysis/review, project quality assurance, and final measurement.
2.	Conduct an enterprise paperless technology wide study.	Identify core decision team. Identify team members to be interviewed. Previous to survey provide education regarding abilities and risks of paperless technologies (for a basic description see introduction to paperless technology section of this white paper). Interview departments, groups, and process representatives to identify how paperless technologies (assuming process improvement) will advance: • quality, • service, • efficiency, • compliance, and • e-discovery response. Compliment the interview team with representatives from information services and records management. Discuss results with General Legal Counsel for their comment. From the enterprise study, stack rank areas and develop a list of top projects. Identify high level application requirements, number of users, resistance to paperless technologies, costs, and a high level ROI calculation. Use above information to develop initiative to reserve funding for overall plan and top projects and to assess project risk.

3.	For selected projects, identify process scope and improvement methodology required.	Based upon required process and operational improvement (e.g. dramatic, incremental, defect reduction, waste reduction) identify process improvement methodology and tools required to accomplish goals. Example methodologies/tools include: • Continuous Process Improvement (CPI) • Business Process Management (BPM) • Re-engineering • LEAN • 5s • Six Sigma • Fishbone Diagram See white paper for description of each methodology. Determine if use of Kaizen events will be beneficial, in addition to regular meetings, to collect required information. Identify procedural changes that can be rolled out previous to implementation, during implementation and after. Identify how workflow technology can be used to improve the process. Develop workflow maps. Take care not to over or under design workflow. As part of the above improvement effort, internal forms should also be examined. Determine ROI, possible through procedural changes and paperless technology changes, separately and together. If any additional costs are presented reaffirm ROI presented in initiative (step 2). Identify and report to core team any change in project ROI or risk.
4.	For selected projects, identify application requirements.	For top projects, identify business level requirements and goals. The document should provide a strong user based narrative of how the system needs to function, not a list of features. Identify detailed technical scanning, capture, recognition, ECM, signature, workflow and ERM requirements necessary to support application requirements and enterprise requirements. Specify data and document privacy and security requirements. Identify acceptance criteria As required, update records governance, policies, procedures and schedules. Document compliance guidelines, roles and responsibilities for electronic and paper records. Identify additional job responsibilities/costs resulting from the system including: scanning, QC, indexing, recognition correction, application support, workflow support, records management support and maintenance. Calculate vendor and internal costs for project. Develop detailed ROI assessment. If any additional costs are presented reaffirm ROI presented in initiative (step 2). Identify and report to core team any change in project ROI or risk.

		Develop RFP, as required and distribute.
5.	Assess vendor and/or internal staff ability to meet requirements.	Assess vendor and internal staff ability to meet application requirements. Have vendor/internal team provide in writing how they will accomplish the business level organizational application design and technical requirements (step 4). Their response should include: • Budget (cost), • time, • resource requirements, • how software will meet requirements (out of the box, configuration, customization). References to software documentation should be provided. • team, • known risks / interdependencies, and • project plan. If any additional costs are presented reaffirm ROI presented in initiative (step 2). Identify and report to core team any change in project ROI or risk.
6.	Require detailed SOW / project plan from vendor/internal team.	For selected, vendors/internal teams, require a detailed SOW affirming how they will meet application requirements and a technical description of how team and software will accomplish application design, workflow and technical requirements. Require an implementation plan that identifies timeline, co-dependencies, risks, responsibilities, and acceptance criteria. If any additional costs are presented reaffirm ROI presented in initiative (step 2). Identify and report to core team any change in project ROI or risk. Vendor begins implementation.
7.	Perform vendor/internal team quality assurance. Measure results.	Conduct independent quality assurance reviews. Require weekly progress reports. Measure progress to meeting goals, timelines, and acceptance criteria. Measure process improvement made possible through project. Identify lessons learned. Identify and report to core team any change in project ROI.
8.	Checklist Disclaimer	As any checklist for planning must to be tailored to the specific need of each organization, the information provided in this checklist should be treated as an introduction and, as such, without a direct consultation of requirements by CRE8 Independent Consultants, CRE8 cannot assume responsibility for the use, implementation or results information provided. The checklist provided may not be incorporated into any other presentation or resold. Any questions regarding use of this checklist or additional information can be directed to consulting@cre8inc.com