

CREATING A PAPERLESS MUNICIPAL COURT

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ABSTRACT

SIMPROCESS® was used to plan a phased migration from a traditional municipal court to a paperless court. The simulation model was also used to provide the financial justification, communication of the concept, and plan staffing for the revised operational procedures.

1 INTRODUCTION

In 1996, the City of Beaverton (COB) Municipal Court (MC) was experiencing growing pains associated with its current business practices and the introduction of a new source of citations, Photo Radar. Over the past three years, the Court had experienced an average increase of 19.5% in total cases filed and projected a conservative annual increase of 14% over the next two years, 1997 - 1998. It was estimated that Photo Radar citations were going to increase the Court's workload by an additional 14,000 to 21,000 citations a year. These volumes exceeded the capacity of the Municipal Court staff and their current processes and systems.

The Municipal Court staff felt they required additional resources and space to provide customers with an acceptable level of service. The workload volumes were stretching staff capacity, forcing them to frequently work overtime. The core processes were paper-driven. Computer systems support was limited and not being fully utilized because of a technology-fearful staff.

In March 1996, the City engaged CACI, Inc. (CACI) to conduct a Business Process Improvement (BPI) analysis and implementation plan for the Municipal Court. The goal of this effort was to understand the Municipal Court's business needs, model and simulate the "As Is" state, develop a "To Be" simulation model, and use the simulation model to sell the City Council the recommended solutions which will significantly improved the Municipal Court operation. The implementation plan addressed the costs, benefits, and actions associated with implementing the proposed solution.

1.1 1996 BPI Analysis

CACI found the Municipal Court required a solution to:

- provide users quick, easy, and reliable access to
- current documents,
- ensure document completeness and accuracy, and
- address formal procedures and technologies.

CACI recommended the implementation of a two phased plan. Phase I - "Less Paper" would ready the Municipal Court for technology insertion by addressing quick hit improvement initiatives for benefits in:

- manual records and filing facilities,
- automated information systems,
- office facilities,
- work flow, and
- scheduling.

In addition, the benefits from this first phase would incrementally increase the staff's operational performance and include them in the design of the second phase. The second phase, Phase II - "Paperless" would introduce an Image & Document Management (IDM) system solution to serve as a physical and electronic repository for documents (citations, receipts, warrants, etc.). The IDM system would be the vehicle by which the staff stores, indexes, and controls the distribution of documents. The IDM system technology would provide substantial time and cost savings. The streamlined IDM system search and retrieval process would save 12 minutes per query in most cases.

The 1996 BPI Analysis projected the City's annual cost savings would be between \$33,000 - \$100,000 with the implementation of Phase I - "Less Paper." Benefits of Phase I include:

- Reduced citation processing (search, retrieval, docketing) by 9%.
- Gain 0.6 Court Clerk FTE.
- Increase the Court's capacity to process citations, including Photo Radar.
- Ready the Court for new technology and processes.

Phase II - “Paperless” implementation would save the City between \$100,000 - \$250,000 per year after the **solution is firmly established**. Benefits of the IDM system include:

- Reduced citation processing by 35%.
- Gain 2.1 Court Clerk FTE.
- Improved customer service by decreasing citation search and retrieval by 20% - 50%.
- Increased citation processing (capture, retention, display, and printing of document images) capacity by 78%.
- Eliminate risk of document loss through systematic document archival.
- Reusable service delivery solution (intra-City or inter-government).

Benefits such as reduced time spent by Municipal Court staff and Records Management staff to find information or correct problems caused by faulty information are an important payoff for the City. While the value of these benefits was not estimated, it is important to remember that they do exist.

2 OVERVIEW

2.1 Solution Implementation (1996-2000)

The City implemented the Phase I – “Less Paper” and Phase II “Paperless” solutions. The following schedule depicts key milestones and decision points for the current Municipal Court IDM system – Windows Court System (WINCS). The project schedule is included in Table 1.

2.2 2000 Impact Analysis

In February 2000, the City engaged CACI to perform an Impact Analysis to quantify the success of the Municipal Court BPI implementation. The Phase I – “Less Paper” incremental savings will be addressed as “soft” savings since no “hard” data was collected for the Jan-97 implementation. This analysis will measure the Phase II – “Paperless” implementation and address the following key questions:

- What actually changed as a result of the consulting project and did it have an impact on the Municipal Court?
- Was the consulting project a good investment?
- Did the project drive key intangible measures, which are often difficult to quantify yet critical to the success of the Municipal Court?
- Does the Municipal Court require additional staff to support current and near future operations?

Table 1: Project Schedule

DATE	MILESTONE
Mar-96	BPI Analysis
Aug-Jan 97	Completion of Phase I – “Less Paper”
Jul-97	Initiation of Phase II – “Paperless”
Nov-97	Decision: COTS or Develop In-House
Dec-97	Decision: PC-DOCS or ISD Solution
Jan-98	<i>Project Risk Assessment</i>
Mar-98	Imaging solution selected
Apr-Jun 98	Conversion Period. Cash and Docket up-to-date. Finalizing work on Court Action Screens and Citation Entry
Jul-98	Court Action Screens implemented.
Aug-98	Scanning Software purchased. Data cleanup efforts underway.
Oct-Nov 98	Scanning documents has begun. Judges using system for 90% of system. Clerks remaining 10%.
Jan-Dec 98	Judges viewing documents. Scanning backlog project underway.
Feb-Apr 99	Staff Training. Docketing in courtroom Special Project: Scanning, Warrants, Suspensions, DMV Abstract, Closing/Archiving Cases.
Jul-Aug 99	Dealing with System issues, development of court standards and statistics. Stop Paper going into the court room.
Sept-Oct 99	Completion of Packages, system generating court forms.
Nov-Dec 99	Wrap-up of system changes.
Jan-Feb 00	ISD finalizing system modules and triggers in preparation for system stabilization. Identification of future system requirements.
Mar-00	Completion of System and Evaluation: Impact Analysis

The purpose of the Municipal Court “As Is” Paperless simulation model is to provide a discrete event process flow of defendants processing through the Municipal Court that captures performance and cost data. SIMPROCESS™ is the discrete-event simulation tool used for this Impact Analysis.

The objective of this model is to focus on the court capacity based on current staffing and uses average arrival rates by case type experienced in 1999. It is important not to attempt to create a model that is exactly like its real world counter part, but rather to develop an adequate representation of the real world system focusing on Counter Check-In, Court Room, Counter Check-Out, Processing, and Failure To Appear (FTA). Figure 1 depicts a screen capture from the simulation model.

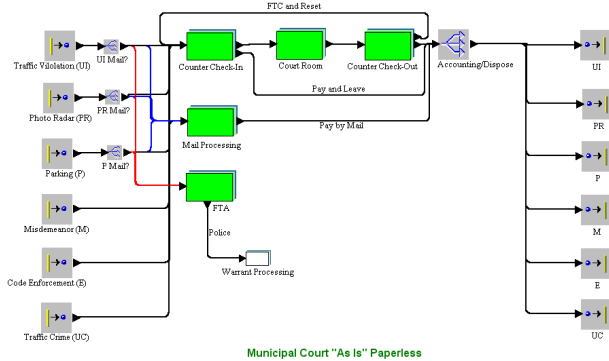


Figure 1: Municipal Court “As-Is” Paperless

The model will be run for one year and three replications.

3 METHODOLOGY

3.1 Impact Analysis Methodology

This analysis was conducted using SIMPROCESS to examine hard data. The impact analysis tasks are given below.

1. Plan Evaluation and Collect Data

Define the objectives, data collection sources, and methods. Collect information through interviews, observation, documentation review, and simulation analysis. This analysis used **Hard Data**: Output Increases, Time Savings, Cost Savings, Quality Improvement. **Soft Data**, i.e., Work Habits, Customer Service, Work Climate/Satisfaction, Employee Development, were used in the ROI.

2. Isolate Effects of Consulting

Determine the amount of performance improvement directly related to the consulting project.

3. Convert Data to Monetary Values

Update the Simulation Model. Collect output measures from the court and finance.

4. Tabulate the cost of the Consulting Project

Tabulate the fully loaded direct and indirect costs related to the consulting project.

5. Calculate the Return on Investment (ROI) and Benefit-Cost Ratio (BCR)

6. Identify Intangible Benefits

In addition to monetary benefits, most projects yield intangible benefits.

7. Document Results

4 ANALYSIS

4.1 Project Benefits and Savings

Was the consulting project a good investment? Did the project drive key intangible measures, which are often difficult to quantify yet critical to the success of the Municipal Court? The following section describes the primary measurements of improvement used in this Impact Analysis. The growth in the number of cases is shown in Figure 2.

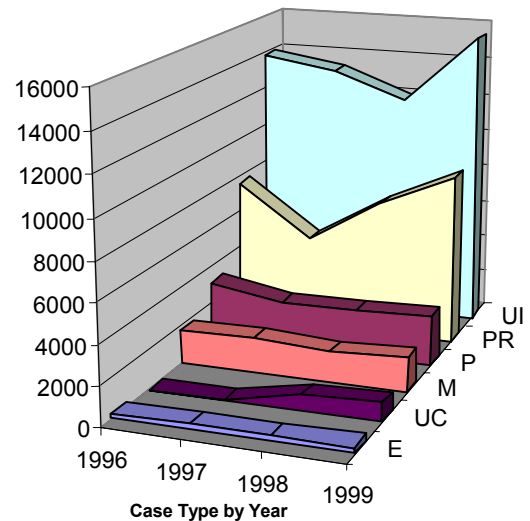


Figure 2: Cases Filed

4.1.1 Hard Savings

• Output Increases

Very visible hard data results achieved from consulting are those involving improvements in the output of the work unit such as cases processed.

• Cases Processed

The Municipal Court was able to support a total 30% increase in Cases Filed from 22,896 in 1995 to 29,966 in 1999. The staff allocation and corresponding numbers of cases filed are shown in the next two graphics.

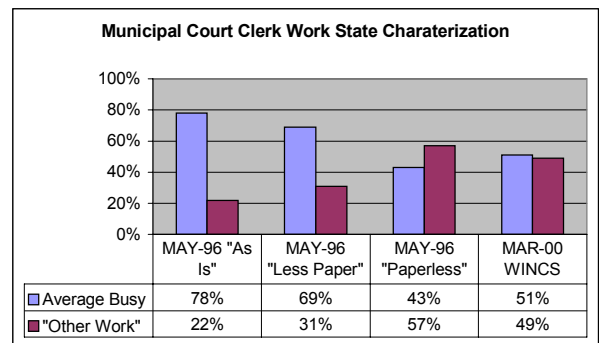


Figure 3: Staff Utilization

Table 2: Case Load

	1995	1996	1997	1998	1999
Total Cases Filed	22,896	26,464	22,729	24,329	29,966
% Incr. or (Decr.)		16%	(14%)	7%	23%

- **Scanning (Cases Updated)**

This is a new capability and cannot be compared to data in the 1996 study. However, scanned forms eliminate the need to archive physical paper including transport of the files, logging/indexing of the files, and storage of the file boxes. In 1996, the City spent \$39,000 / year archiving Court Cases.

- **Work Backlog Reduced**

In 1996, the Municipal Court had an average of a one to two week backlog of cases to be updated and filed. This backlog meant that the case information was not readily available for other personnel, i.e., police and city attorneys.

Today, cases are immediately available to all authorized personnel and updated with scanned “post-trial” information within 24 – 48 hours.

4.1.1.1 Quality Improvement

One of the most significant hard data results is quality. Court cases require a high degree of data quality since there are legal ramifications associated with inaccurate data.

- **Waste**

In 1996, police time was frequently wasted due to poor docket scheduling. The WINCS system now offers police an accurate view of the court schedule and the means to communicate via e-mail. Scheduling conflicts will be significantly reduced.

- **Rejects / Error Rates**

No hard data available. Typically, Image Document Management systems reduce human error since computer systems use edits to check data entered. WINCS will offer court personnel a first line of defense against inaccurate data; however, the ultimate responsibility for accuracy still resides with the human.

- **Rework**

In 1996, court clerks processed ~ 88% of their forms manually, either typewritten or handwritten. Some of this information was reentered into the HP system. This rework has been completely eliminated. The cost savings are noted in the Average Delay Time category.

- **Customer Complaints**

No hard data available. In 1996 defendants waited in the counter check-in line for 30 minutes

or more and lines often extended beyond the Municipal Court hallway. Shorter waiting times decrease the likelihood that a clerk will encounter an impatient defendant.

It was recently observed that the defendants averaged a 5-10 minute wait in the counter check-in line during peak times. Counter processing averaged ~ 2 minutes.

4.1.1.2 Cost Savings

Improvement in cost is a typical hard data results area.

- **Budget Variances**

The Staffing Level has increased from 8.6 FTE in 1996 to the current 11.75 FTE for an annual increase of \$56,258. This increase in staff can be attributed to the additional work resulting from transition to the WINCS as well as the 30% increase in cases processed since 1995.

- **Unit Costs (By Case Type)**

This table identifies the average cost per case as a result of the simulation model. SIMPROCESS simulation models Oct-97 and Mar-00 were used to determine the cost by Case Type.

Table 3: Simulation Cost Results

Entity Name	Average Cost Per Entity		
	Oct-97 12-Month	Mar-00 3-Month	Mar-00 12-Month
UTC	\$ 5.54	3.07	\$ 2.11
Parking	\$ 6.60	3.10	\$ 2.12
Misdemeanor	\$ 3.30	5.77	\$ 3.94
Codeviolation	\$ 0.29	3.03	\$ 2.08
Photo	\$ 2.03	3.07	\$ 2.10

- **Lost Revenue**

In 1996, the Municipal Court had frequently dismissed cases because case files could not be found due to the manual in-process workflow, back-log, and filing process. As a result, the City lost revenue and often expended police and attorney time.

4.1.1.3 Time Savings

Easy to measure and just as critical as cost and quality, time savings translate into additional output and lower operating costs.

- **Processing Time**

The six Clerks achieved a 27% increase in processing capacity from an average busy state of 78% in 1996 to an average busy state of 51% in March 2000. *This data represents the average busy state (working on processing citations) for 6 clerks for a three month simulation, run for three*

replications. This data indicates that additional personnel are not needed to support the current workload.

- **Average Delay Time**

The manual processing of paper forms and reports was time consuming, prone to error, caused backlog, and poor workflow - heavy foot traffic in the office. The 1996 study found that if all forms were eliminated the City would save \$250,000/yr. This savings did not include the labor for docketing and filing the original forms.

The **labor cost associated with manual forms** (Time To Complete) used the 1996 Forms Analysis and adjusted the calculation by increasing the annual case volume by 11% and labor rate from \$19 to \$20 per hour. The labor cost was calculated as Monthly Hours + 11% Annual Case Increase x \$20/Hour Labor x 12 Months x 6.25 factor (6.25 gives us 100% since the 1996 study sampled 16% of the manual forms). Paper cost is based on \$0.07 per page.

A conservative percentage was used to calculate the savings during the Phase I – “Less Paper” initiative (completed in 1997) and the Phase II- “Paperless” transition period, June 1998 through December 2000.

Table 4: Realized Savings

	1998	1999	2000*	Total Saving
Savings Realized Labor and Paper Savings	25% \$75 k	50% \$166 k	100% \$370 k	\$612 k

It is estimated that since the beginning of this project, the Municipal Court has saved at least \$400,000 in manual paper processing costs.

Year 2000 is a full year which will give ISD and the Municipal Court time to reduce or eliminate the remaining six paper forms. The WINCS 2000 system affords the Municipal Court an annual savings of 96% in processing photo radar receipts.

4.1.2 Soft Savings

Customer Service, Work Climate/Satisfaction, Work Habits, Employee Development, were not used in the ROI analysis. The following BCR and ROI calculations only use the following hard savings -- labor and paper cost associated with manual forms totalling \$612,472.25 and archival costs of \$70,000.00.

The hard saving in these two areas is \$682,472.25.

4.1.2.1 Benefit-Cost Ratio (BCR)

Benefit-Cost Ratio is a method that compares the annual economic benefits of the consulting project to the cost of the consulting. The ratio is:

$$BCR = \frac{\text{Consulting Benefits}}{\text{Consulting Costs}}$$

The Municipal Court BPI project has a BCR of 1.57 or 1.57:1. For each dollar spent on consulting, \$1.57 are returned in benefits. The first-year payoff for the project was \$682,472. The total fully loaded implementation cost was \$433,400. Thus, the ratio is:

$$BCR = \frac{\$682,472}{\$433,400} = 1.57:1$$

4.1.2.2 Return-On-Investment (ROI)

The Return-On-Investment formula is expressed as a percentage. The ROI is:

$$ROI = \frac{\text{Net Consulting Benefits}}{\text{Consulting Costs}} \times 100$$

Thus, the return on investment becomes:

$$ROI = \frac{\$682,472 - \$433,400}{\$433,400} \times 100 = 57\%$$

5 CONCLUSION

The Municipal Court BPI project started as a Business Process Improvement project with expected performance gains of 10-40%. The radical transformation in performance gains and degree of change is a result of a hybrid BPI / BPR project. The two approaches differ in philosophy, leadership requirements, scope, expected performance gains, and other characteristics such as timing, cost, risk, and pain. It appears the City used a range of techniques along a continuum, from incremental gradual change through revolutionary and rapid change. As a result, the City realized a performance gain of 51%.

It is clear that the Municipal Court has successfully undergone a quantum transformation from the 1996 manual-paper-based process to the new “Paperless” IDM system – Windows Court System (WINCS).

The new technology has positioned the City to adequately support future growth and leverage the technology investment by extending components of the WINCS system and technology to other parts of the City, e.g., City-wide Scanning.

Future improvements include moving the Municipal Court WINCS online via the Internet. This Government-to-Citizen Internet link may include a site that gives both court information and the ability to pay fines by credit card or electronic check over the Internet 24 hours a day, 7 days a week, without increasing staffing levels or hours of court operations. This use of the Internet is attractive given the likely increase in case volumes with the introduction of Photo Red Light or the addition of more Photo Radar Vans. An online court payment system will allow the MC to collect a higher percentage of fines faster, while saving money currently spent on processing “walk-in” defendants.

The following characteristics represent an important paradigm shift from 1996 to 2000.

Table 5: Processing Differences from 1996 to 2000

FROM:	TO:
<ul style="list-style-type: none"> • Paper-driven • Hierarchical • Solo resident experts • Information-limited environment • Delayed access • Slow response • Data entered more than once • People do processing 	<ul style="list-style-type: none"> • Electronic-based • Networked • Teams by talent • Information-unlimited environment • Instant access • Prompt response • Data entered once
<ul style="list-style-type: none"> • Technology-fearful • Business as usual 	<ul style="list-style-type: none"> • Technology does processing • Technology-savvy • Continual improvement

The Municipal Court has begun to investigate a courtroom videoconferencing link with jails and juvenile detention facilities is another area. Videoconferencing can potentially save courts the cost of on prisoner transportation. Undoubtedly, the Municipal Court will continue to use SIMPROCESS models to analyze, communicate, and measure City investments. The table on the next page documents the changes from 1996 to 2000 and identifies the impact associated with the changes.

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Table 6: Impact of Processing Change

1996	➔ 2000	➔ IMPACT
Organization		
1. Staff Reached Work Capacity	Steady Staff: Work Momentum	➤ Spare Capacity
2. 8.6 FTE	11 FTE (2 Vacancies)	➤ Increase due to change state and additional court time
3. Many Hand-Offs	Few Hand-Offs	➤ Improved Customer Service – Response Time, Info Quality
4. Trained by Example vs SOP	Trained by Example (Procedures Outdated)	➤ Formalized Structure and Procedures Underway – Quicker and Consistent Training
5. Key Person Dependencies	Moderate Cross-Training	➤ No Key Person Dependencies
Business Process		
6. Serial Input-Process-Output (IPO) Practice	Workflow	➤ Parallel Processes ➤ Customer focused
7. Physical Document Focused	Electronic	➤ File Storage and Retrieval ➤ Data Collection and Analysis ➤ Quality Control and Accuracy ➤ Backup
8. Multi Document Storage Locations with Multi Filing Systems	One Database	➤ Eliminated need for satellite files ➤ Better access and linkage between documents ➤ Easier document retrieval-indexing
9. 73 Forms – 88% handwritten or typewritten	6 Forms	➤ Forms Reduced by 91% ➤ Save ~ \$370,000 year in labor and paper
10. Growing Customer Base	Growing Customer Base	➤ Steady Growth of Customer Base
11. Long and Slow Counter Lines	Quick Moving Counter Lines	➤ Improved Customer Satisfaction
12. Limited Capacity (1 Judge, Day Court Only)	Spare Capacity (2 Judges, Day and Evening Court)	➤ Ready for Increased Workload, eg, Photo Red Light
13. Fragmented Metrics	Learning to use Metrics and Reports	➤ Monitor and Continuously Improve Process
14. Underutilized Skills	Cross Training	➤ Basic Knowledge Workforce
Technology		
15. No Confidence in System	Entire staff using WINCS	➤ WINCS is core to the new process
16. Redundant Preparation of Data	Single processing of data	➤ Increased data quality by eliminating multiple manual data entry activities
17. Lengthy archiving	Electronic archiving via scanning (~ 6 – 24 hour access to scanned case information)	➤ Improved document access by ~86%. Reduced access to case information from 7 days to 1 day.
18. Poor User Interface	User friendly Windows GUI	➤ Easy to use system ➤ Improved acceptance and use of technology ➤ Extended use of technology to include Judges
19. Lack of Integration	Integrated system	➤ Automated Interfaces, ie,
20. Data Stored in Filing Cabinets	Electronic data	➤ Database ➤ Save ~ \$70,000 year in archiving