Re-engineering the PBSO Serology/DNA Section Through Process Mapping

September 28, 2005
Karin A. Crenshaw
Palm Beach County Sheriff’s Office
Largest county in Florida
✓ 34 local police agencies
✓ Palm Beach County SO
✓ Medical Examiners Office
✓ Local FBI, DEA, ATF, FHP
✓ Universities and area schools

2003: 742 Cases submitted
2004: 1735 Cases submitted

Palm Beach County
1,200,000 pop
PBSO Serology/DNA Section:

- 1 Supervisor - 35% Casework
- 1 CODIS Administrator/ Sr. Forensic Scientist 80%
- 1 Technical Leader/Sr. Forensic Scientist 40%
- 2 Sr. Forensic Scientist 80%
- 2 Forensic Scientists 80%
- 1 Laboratory Analyst
- 1 Technician

• Lab designed in 1987 for ABO
• 2,600sqft
Why pay for someone to come into the laboratory,
Spend over a week asking you minutia about your job,
And summarizing what you think you already know???

Because data speaks louder than words...
PBSO

History of DNA profiling

Validation: 2nd Generation

Sept, 1995

Validation: 3rd generation

Feb, 1998

Begun validating “dot-DNA”

Spring, 1992 BEGIN DNA PROGRAM

Lab Designed: ABO Typing

Late 1980’s = 2,600ft²

May, 1993 → 1rst DNA case

LDLR GYPA                HBGG                  D7S8 GC
A        B           A          B          A          B         C       A           B          A           B
PBSO History of DNA profiling

Validation:
- 4th Generation Single-amp
- *CCDBIO-quants

April, 2001

2003

Validation:
- Other Stuff
10ng   5ng   2.5ng   1.2ng   0.6ng   0.3ng   0.15ng   0.075ng

HITACHI CCDBIO
IMAGING SYSTEM
April, 2001

ABI PRISM® 7000 Sequence
Detection System
February 14, 2005
February, 2003
Beginning a paperless system

Sperm Cell Documentation Imaging System
From Mideo Systems
JUNE, 2003:  BIOMEK2000
VALIDATION COMPLETED

“Edward Pipette Hands”

Nearly 3000 casework samples have been extracted
November, 2003

**“THE LETTER”**

ALL IN 2,600SQFT...NEED MORE SPACE!!!!

2003

Validation: Other Stuff

April, 2001

Validation: 4th Generation Single-amp *CCDBIO-quants
October 15, 2003

MiraiBio-Hitachi
Service Agreement Letters Sent:
FMBIO II / II e: 3 years
from October 1, 2003

RE: Service Agreement for FMBIO II/e and FMBIO II/III Plus

Dear «Title» «LastName»:

This letter is to confirm the information provided to FMBIO Laser Fluorescence Scanner users at the Fourteenth International Symposium on Human Identification (Promea Meeting) in Phoenix, Arizona on September 29, 2003.

MiraiBio, Inc. and it's parent company Hitachi Software Engineering Co., Ltd. guarantee that service agreements and technical support will be available to all FMBIO II/e and II/III plus users. Service agreements will be provided for up to five years from October 1, 2003 depending on the FMBIO model.

Customers with FMBIO II/e shall have the opportunity to sign service agreements for up to three years. The service agreements may be on a year to year basis.

Customers with FMBIO II/III plus shall have the opportunity to sign service agreements for up to five years. The service agreements may be on a year to year basis.

For additional information about the service agreements please contact our Assistant Director of Marketing, Don Fourby at 510.337.2038.

MiraiBio would also like to take this opportunity to thank you for your loyalty and business.

Sincerely,

MiraiBio, Inc.

Masakazu Kuji
COO
What does this mean for PBSO???

October, 2006…Accreditation FBI Standard 10.2

"Does the laboratory have a documented program for the calibration of equipment and instrumentation?

10.2.2: For each instrument requiring calibration, has the frequency of calibration been documented..?"

No longer will be able to comply…

Must consider an alternative platform.. regardless…

We are out of space
SERO/DNA applied for and received NIJ Funding

1996- $96,000 2nd generation DNA Profiling
1998- $150,000 3rd generation
2000- $150,000 4th generation

2002 - $580,000 – casework*
2003- $368,000 – casework*

$1,344,000

FOR 8 YEARS, THE SEROLOGY/DNA BUDGET INCLUDED ADDING PERSONNEL AND SPACE…Have increased Personnel by 5…No space…
It was no longer about money...

it was about space..

If more space is not acquired soon, there will be no PBSO DNA program beginning October 1, 2006

“THE LETTER” was the key to progress
July, 2003 Verbal Notification Platform will become Obsolete
Oct, 2003 “The Letter”
Feb, 2004 Request NIH Grant Process Mapping $$$’s

April, 2004, Request NIH Grant Renovation $$$$$’s
April, 2004 Request for space at PBSO
May, 2004 Meeting w/County Representatives

July, 2004 NIH Approval $ Process mapping
August, 2004 NIH $ Approval Renovation $674,414
August, 2004 Process Mapping
Sept 28, 2004 DRB= DNA Review Board

GOAL = RENOVATED LAB OCT, 2005
PBSO AGREES TO MOVE THE SPECIAL INVESTIGATION BUREAU TO ANOTHER LOCATION. 5200 SQFT NOW DEDICATED TO THE SEROLOGY/DNA SECTION.
HOW ARE WE GOING TO DESIGN A LAB AND GET READY FOR OUR FUTURE IN LESS THAN 6 MONTHS??

2004 AAFS mtg: Several presentations on Process Mapping

Process Mapping –
Illustrated description of how things get done, which enables participants to visualize an entire process and identify areas of strength and weaknesses.

It helps reduce cycle time and defects while recognizing the value of individual contributions.
Quality Forensics and the Baintree Group... joint renewal process product called the Forensic Laboratory Renewal Program (FLRP)

Quality Forensics is a member of the Fitz Group and is headquartered in Minnesota. The company provides process renewal and proficiency testing services to support quality assurance programs of the forensic community.

The Baintree Group is a British Columbia based company focused on the improvement of project management practices of forensic laboratories throughout the world. The company provides project management series, process renewal services and executive coaching services.
FUNCTION:
These companies developed a forensic specific process renewal program to assist laboratories in meeting the challenges ahead.

FLRP is a four phase process program including
1) a current status process review workshop,
2) future state process design,
3) implementation planning, and
4) implementation management.

RESULT: The improvements optimize laboratory resource management and effectively reduce laboratory costs.
What did PBSO want to accomplish?

1. **Design our future:**
   * Prepare for more analysts (9->12 over the next 5 yrs)
   * Identify a DNA program based on future technology

2. **Design a rough floor plan for the newly acquired space.**

3. **Become more efficient by identifying areas of wasted time**
THE PROCESS
Documenting Procedures
DOCUMENTING THE PROCESS
Risk Assessment

Instrumentation
<table>
<thead>
<tr>
<th>Question</th>
<th>Hitachi</th>
<th>ABI</th>
<th>GE –CE</th>
<th>Microchip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does it permit Interoperability/Integration with current information technologies?</td>
<td>No</td>
<td>Yes</td>
<td>Yes?</td>
<td>Yes</td>
</tr>
<tr>
<td>Will it permit an increase in sample throughput?</td>
<td>20%</td>
<td>No</td>
<td>Unknown</td>
<td>1000%</td>
</tr>
<tr>
<td>Will there be a decrease in the cost of supplies?</td>
<td>No</td>
<td>Increase</td>
<td>Unknown</td>
<td>Yes</td>
</tr>
<tr>
<td>Will there be a decrease in the time it takes to prepare a sample?</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Unknown</td>
</tr>
<tr>
<td>Will the court system accept the scientific findings?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Unknown</td>
</tr>
<tr>
<td>Is it acceptable to the general scientific community.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Will it work in PBSO Serology/DNA?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Unknown</td>
</tr>
<tr>
<td>Is the company suitability to a forensic environment and will it support the technology?</td>
<td>Yes</td>
<td>No</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Does the equipment provide for standard data outputs?</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Unknown</td>
</tr>
<tr>
<td>Is the company able to provide assurances of business continuity?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Does it meet the forensic community standards for operation and QA?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Is the equipment reasonably easy to trouble shoot?</td>
<td>Yes</td>
<td>Somewhat</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Does the equipment have a reputation for low maintenance requirements?</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Unknown</td>
</tr>
</tbody>
</table>
## Project Risk Assessment

<table>
<thead>
<tr>
<th>Risk</th>
<th>Probability</th>
<th>Impact</th>
<th>Mitigation Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical/Scientific</td>
<td>Evidence Reception Stays with Science (1 year additional labor)</td>
<td>50%</td>
<td>Can't increase case load objective of 25% per year and the project will be delayed by ( \frac{3}{4} ) of a year</td>
</tr>
<tr>
<td>Financial</td>
<td>Funding (grant)</td>
<td>15%</td>
<td>Less capacity increase in turnaround time</td>
</tr>
<tr>
<td>People</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market</td>
<td>Project Priority</td>
<td>30%</td>
<td>Time Delay</td>
</tr>
<tr>
<td>Lack of Staff Capacity</td>
<td></td>
<td>10%</td>
<td>Loose staff, capacity, quality</td>
</tr>
<tr>
<td>CRITICAL SUCCESS FACTORS</td>
<td>CRITICAL FAILURE FACTORS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• ER responsibility shifts out of science</td>
<td>• No change in evidence reception process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✗ Construction funding received by August 31st</td>
<td>✗ No construction before new sheriff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✗ SIU Relocated by November 1st</td>
<td>✗ No additional non grant or grant funding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✗ Blueprint completed by December 1st</td>
<td>✗ No partnerships</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✗ Political leverage to receive funding PBS Internal and county</td>
<td>✗ SIU does not relocate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✗ Detailed planning and execution of the advisory board and project plan</td>
<td>✗ Non effective DNA Renewal Board or no committee created</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✗ Delegate appropriately</td>
<td>✗ Lack of action on the project plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✗ Form key partnerships with experienced internal stakeholders</td>
<td>✗ Inappropriate delegation of responsibility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✗ Dedication of serology department</td>
<td>✗ Lack of county commissioner buy-in</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Group Report
Forensic Laboratory Renewal Process
of the PBSO Serology/DNA Section

Prepared for;

Cecelia Crouse, PhD
Supervisor
Serology/DNA Section
Technical Services Bureau
Palm Beach Sheriff's Department

Submitted August 20th 2004
Looking towards the future

- 60 Months – Select, Install, Deploy, Integrate and process 15000 samples
- 2003 – 3000 samples processed
- 2004 - 5000 samples will need processing
- 30% increase is sample loads

Biggest Inefficiency: approving evidence for submission…
Effort is being duplicated
- Time wasters
- Look for files
- Clerical/admin work

Scientist clerical effort equating 100 cases per year OR 16 days/mo spent documenting evidence acceptance…

NEW EVIDENCE COORDINATOR
**DNA RENEWAL BOARD**

<table>
<thead>
<tr>
<th>Department</th>
<th>Contact Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crime Laboratory</td>
<td>Cecelia A. Crouse</td>
</tr>
<tr>
<td></td>
<td>Ben Perillo</td>
</tr>
<tr>
<td>Administration</td>
<td>Barbara Caraballo, Budget</td>
</tr>
<tr>
<td>Information Systems</td>
<td>Morris Bell (or designee)</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>Bill Stewart</td>
</tr>
<tr>
<td>Facilities Management</td>
<td>Bill Steinebach (or designee)</td>
</tr>
<tr>
<td>Law Enforcement</td>
<td>Cpt. James Stormes (or designee)</td>
</tr>
</tbody>
</table>

**#4**

Coordinate our efforts to meet this deadline
Summary:

1. One of the best investments of time and money ever made!

2. Within 6 months we:
   1. Re-engineered our entire laboratory
   2. Prepared for expansion in the near future
   3. Opened communication with management ("The Letter" helped)
In April, 2005, we were notified that MiraiBio - Hitachi will honor maintenance agreements indefinitely…
Mel
Julie
Karin
Cec
Tara
Cathy
Misti
Dawn
Amy

Have a 1 in 357 Septillion Holiday

The Serology/DNA Section
Acknowledgements:

- The Baintree Group
- Quality Forensics
- Dave Coffman