NSA SCIENTIFIC ADVISORY BOARD

PANEL ON DIGITAL NETWORK INTELLIGENCE (DNI)

(Née "C2C")

Report to Director

Lt Gen Jim Clapper USAF(RET)

Panel Members

(b)(3)-P.L. 86-36

28 June 1999

OVERALL BRIEFING CLASSIFICATION

~~SECRET//COMINT//X1~~

Released by NSA on 17-May-2004
pursuant to the Freedom of Information Act
Case #: 41178

... Subtitled...

You asked for the time of day...

OVERALL CLASSIFICATION OF THE BRIEFING:
~~SECRET//COMINT//X1~~

AGENDA

→ 1. Purpose
2. Background
3. Definitions and Historical Overview
4. Importance of 'C2C'
5. Target/Technology Trends - DNI Definition
6. "TAXONOMIES"
    - Deployment
    - Functional / SMM
    - Skills
    - Systems
    - Organizational
    - Resources
7. Conclusions
8. Recommendations

1. Purpose

- Describe broad strategy for "C2C"
- Respond to Congressional tasking regarding (b)(3)-P.L. 86-36

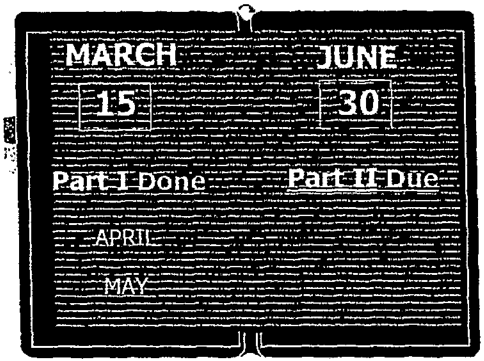
2. Background

- **Congressional direction - FY99 Intelligence Authorization Act.**
  - **Focuses on NSA management of conventional and "C2C" programs**
  - **Requests DIRNSA task NSASAB for two part study**

UNCLASSIFIED

2. Background

Part II : Conventional & "C2C" areas (Due 30 June)


MARCH
15
JUNE
30
Part I Done
Part II Due
APRIL
MAY

The Tasking

- **"NSASAB should consider broader applications of SARC (SIGINT Automation Research Center) accomplishments and recommend additional SARC R&D activities for automation of collection, analysis and reporting of 'C2C' "**
- **"Identify technical direction and planning for 'C2C' survey"**
- " Do the same thing for 'C2C' that the NSASAB panel did for Conventional under part I "

The Challenge

[redacted]

(b) (1)
(b) (3)-P.L. 86-36
(b) (3)-18 USC 798
(b) (3)-50 USC 403

~~CONFIDENTIAL~~

The Challenge (cont'd)

(b) (1)
(b) (3)-P.L. 86-36
(b) (3)-18 USC 798
(b) (3)-50 USC 403

[redacted]

The REAL Challenge

- The responses to these questions transcend (b)(3)-P.L. 86-36 and the SARC
- They point out an entirely new paradigm for SIGINT

~~CONFIDENTIAL~~

The Real Imperatives....

- A commitment to re-tool: organizationally, programmatically, and technologically
- A universally understood template of the concept of SIGINT as it should be conducted and managed
- A plan of action which embraces the principle that *"Form Follows Function"*

AGENDA

1. Purpose
2. Background
3. Definitions and Historical Overview
4. Importance of 'C2C'
5. Target/Technology Trends - DNI Definition
6. "TAXONOMIES"
    - Deployment
    - Functional / SMM
    - Skills
    - Systems
    - Organizational
    - Resources
7. Conclusions
8. Recommendations

(b) (1)
(b) (3)-P.L. 86-36
(b) (3)-18 USC 798
(b) (3)-50 USC 403

What is "C2C" ?

- **Term unique to NSA and its partners**

[redacted]

~~CONFIDENTIAL~~

AGENDA

1. **Purpose**
2. **Background**
3. **Definitions and Historical Overview**
4. → Importance of 'C2C'
5. **Target/Technology Trends - DNI Definition**
6. **"TAXONOMIES"**
    - **Deployment**
    - **Functional / SMM**
    - **Skills**
    - **Systems**
    - **Organizational**
    - **Resources**
7. **Conclusions**
8. **Recommendations**

UNCLASSIFIED

4. The Importance of 'C2C'

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

AGENDA

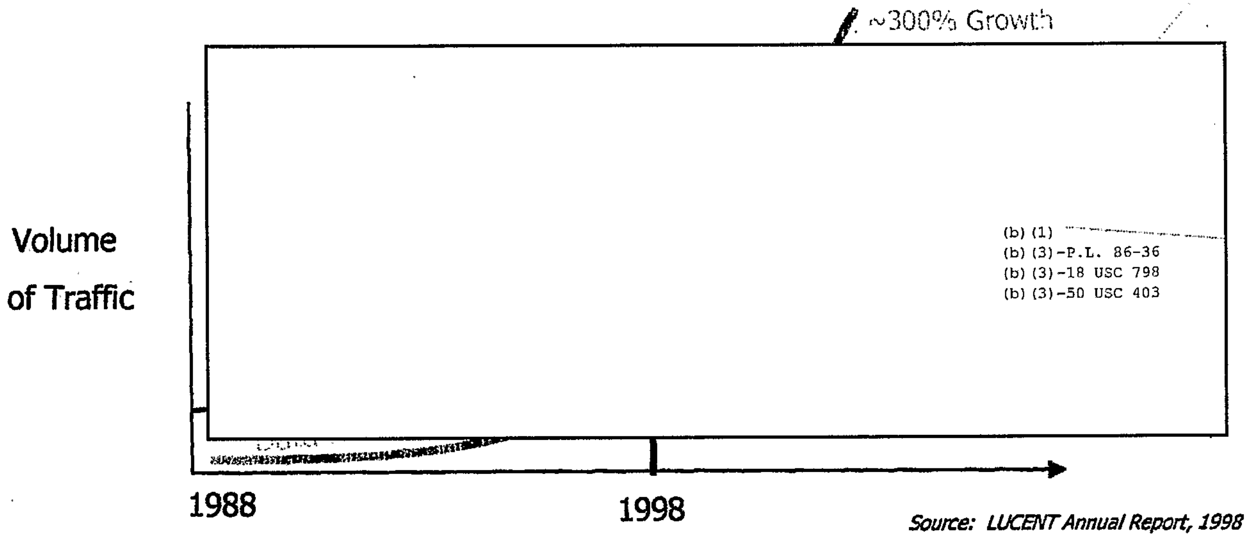
1. **Purpose**
2. **Background**
3. **Definitions and Historical Overview**
4. **Importance of 'C2C'**
5. Target/Technology Trends - **DNI** Definition
6. **"TAXONOMIES"**
    - **Deployment**
    - **Functional / SMM**
    - **Skills**
    - **Systems**
    - **Organizational**
    - **Resources**
7. **Conclusions**
8. **Recommendations**

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

[redacted]

5. Target/Technology Trends

[redacted]



[redacted]

(b) (1)
(b) (3)-P.L. 86-36
(b) (3)-18 USC 798
(b) (3)-50 USC 403

Source: LUCENT Annual Report, 1998

This profound change mandates a new paradigm

~~CONFIDENTIAL//COMINT//X1~~

5. Target/Technology Trends - DNI Definition

Digital Network Intelligence

DNI

The new SIGINT paradigm

"The intelligence from intercepted digital data communications transmitted between, or resident on, networked computers"

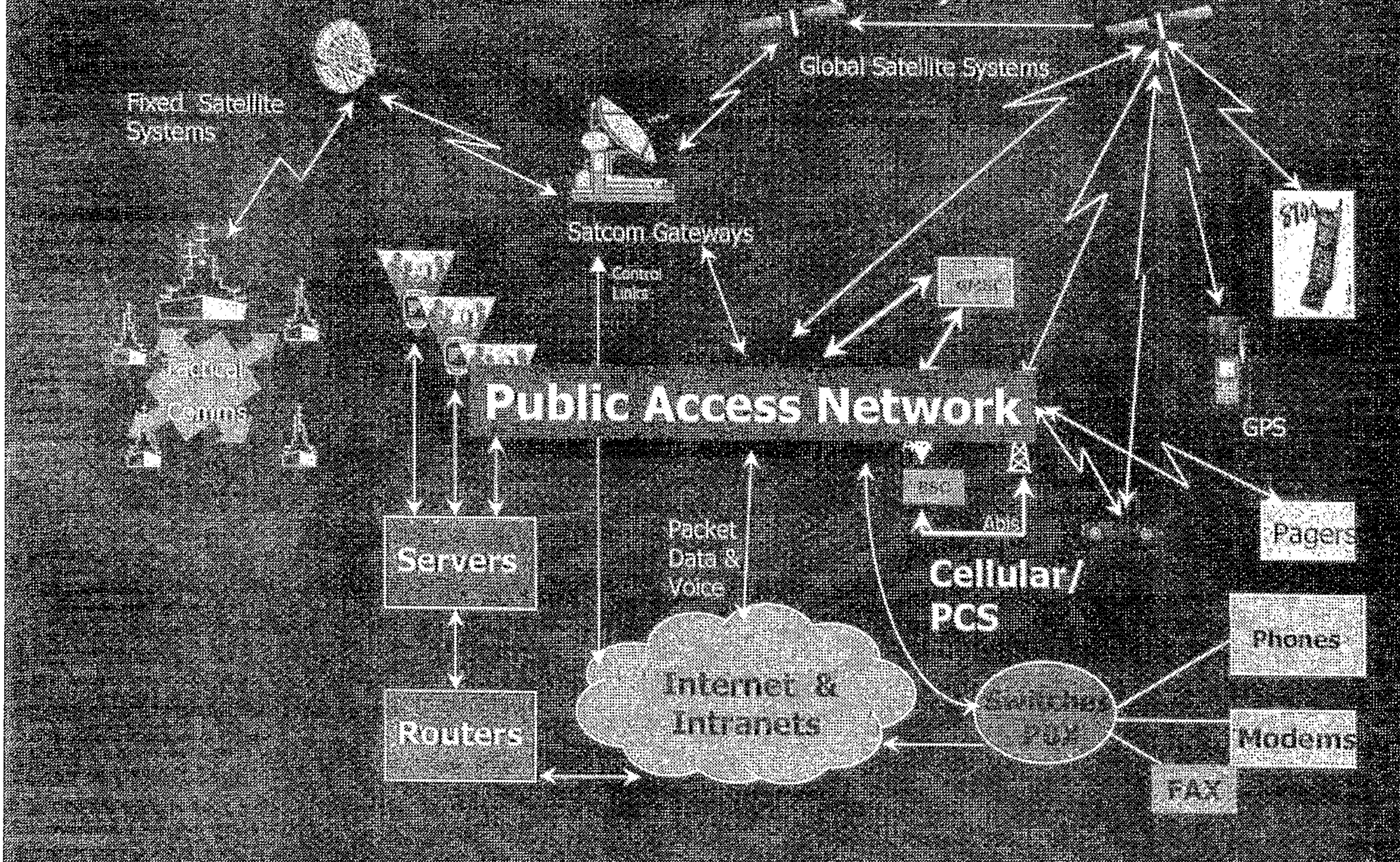
AGENDA

1. Purpose
2. Background
3. Definitions and Historical Overview
4. Importance of 'C2C'
5. Target/Technology Trends - DNI Definition

→ 6. "TAXONOMIES"
    - Deployment
    - Functional / SMM
    - Skills
    - Systems
    - Organizational
    - Resources

7. Conclusions
8. Recommendations

"A Network of Networks - The Global Network Infrastructure (GNI)"


Global Satellite Systems
Fixed Satellite Systems
Satcom Gateways
Control Links
Tactical Comms
Public Access Network
GPS
Pagers
Abis
Cellular/ PCS
Servers
Routers
Packet Data & Voice
Internet & Intranets
Switches / PBX
Phones
Modems
FAX

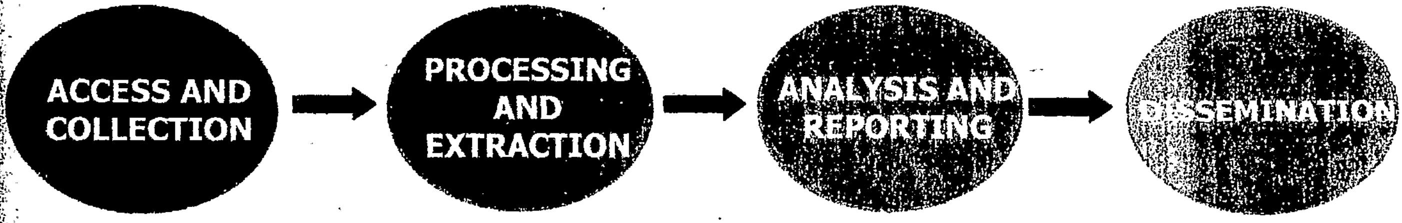
(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

[redacted]

AGENDA

1. **Purpose**
2. **Background**
3. **Definitions and Historical Overview**
4. **Importance of 'C2C'**
5. **Target/Technology Trends - DNI Definition**
6. **"TAXONOMIES"**
    - **Deployment**
    - → Functional / SMM
    - **Skills**
    - **Systems**
    - **Organizational**
    - **Resources**
7. **Conclusions**
8. **Recommendations**

DNI FUNCTIONAL TAXONOMY


ACCESS AND COLLECTION
PROCESSING AND EXTRACTION
ANALYSIS AND REPORTING
DISSEMINATION

Definitions

Includes Attendant Operational & Management Activities

A&C - The activity of identifying and acquiring target networks

P&E - The process of converting machine language into human language

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

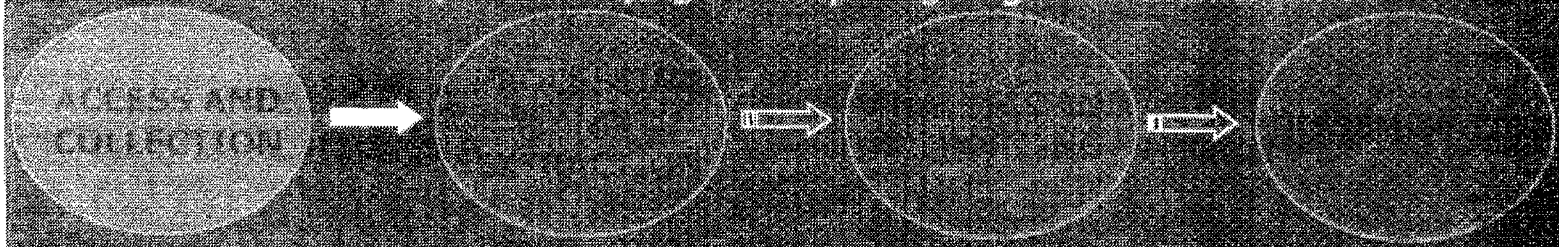
Dissemination - **The forwarding and presentation of multimedia intelligence products**

~~CONFIDENTIAL//COMINT//X1~~

DNI FUNCTIONAL TAXONOMY

ACCESS AND COLLECTION

The activity of identifying and acquiring target communications


ACCESS AND COLLECTION

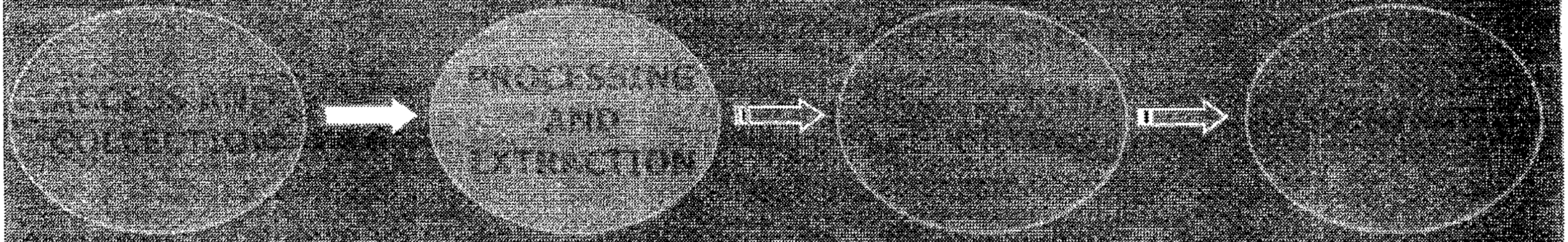
Types of Access

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

PROCESSING AND EXTRACTION

The process of converting machine language into human language


ACCESS AND COLLECTION
PROCESSING AND EXTRACTION

Manipulating huge volumes of heterogeneous complex data

Within P&E there are 4 major functions...

DNI PROCESSING CYCLE

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

6. Functional Taxonomy - Processing

PROCESSING FUNCTIONS

[redacted]

[redacted]

(b) (1)
(b) (3)-P.L. 86-36
(b) (3)-18 USC 798
(b) (3)-50 USC 403

(b) (1)
(b) (3)-P.L. 86-36
(b) (3)-18 USC 798
(b) (3)-50 USC 403

6. Functional Taxonomy - Processing

Example of the signal processing challenge - Where/What do we extract ?

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

6. Functional Taxonomy - Processing

PROCESSING FUNCTIONS

[redacted]

[redacted]

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

6. Functional Taxonomy - Processing

PROCESSING FUNCTIONS

[redacted]

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

[redacted]

~~CONFIDENTIAL//COMINT//X1~~

6. Functional Taxonomy - Processing

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

PROCESSING FUNCTIONS

[redacted]

[redacted]

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

[redacted]

[redacted]

6. Functional Taxonomy - Processing

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

METADATA

METADATA

DEFINITION:

[redacted]

(b) (1)
(b) (3)-P.L. 86-36
(b) (3)-18 USC 798
(b) (3)-50 USC 403

IMPORTANCE:

Reduces the amount of irrelevant intercepted data

Critical to SIGINT Mission Management and applies to all missions

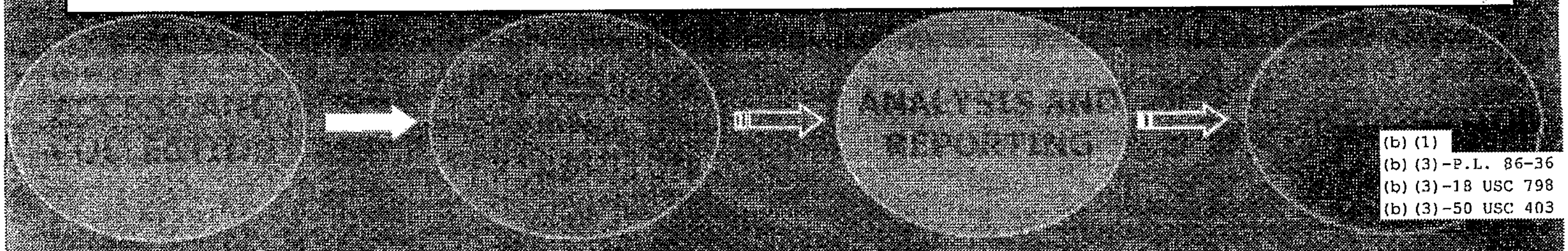
The End-to-End DNI Process

(b)(3)-P.L. 86-36

CONFIDENTIAL

Analysis and Reporting

[redacted]


ANALYSIS AND REPORTING

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

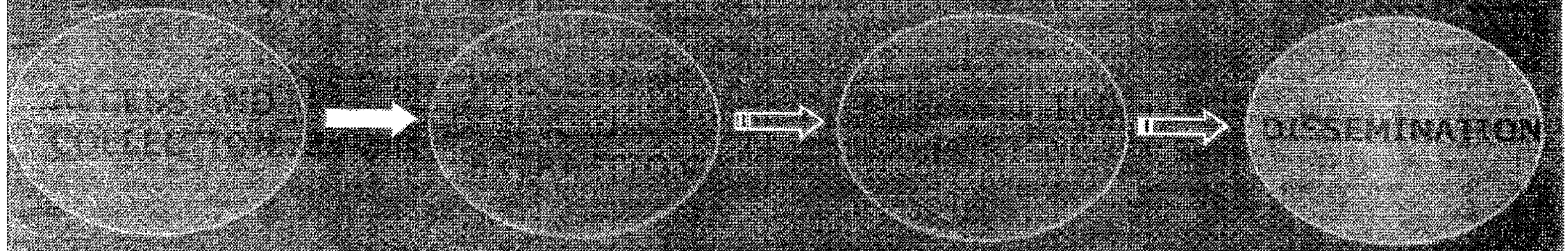
[redacted]

Reporting was text based - Now moving to MULTIMEDIA

6. Functional Taxonomy - Dissemination

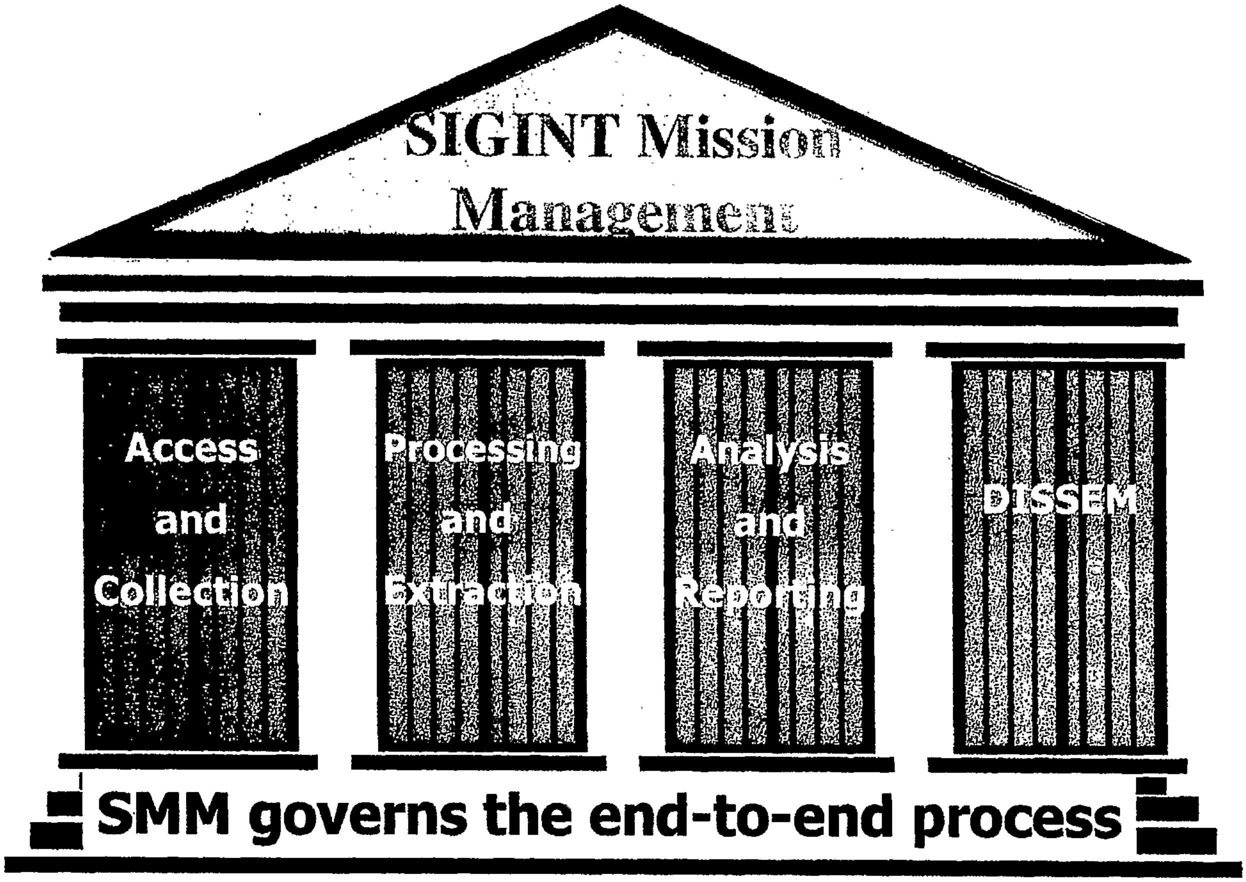
DISSEMINATION

The forwarding and presentation of intelligence products


ACCESS AND COLLECTION
DISSEMINATION

DNI traffic contains multiple media types (multimedia)

~~CONFIDENTIAL~~



SIGINT Mission Management

Access and Collection

Processing and Extraction

Analysis and Reporting

DISSEM

SMM governs the end-to-end process

~~CONFIDENTIAL~~

AGENDA

1. **Purpose**
2. **Background**
3. **Definitions and Historical Overview**
4. **Importance of 'C2C'**
5. **Target/Technology Trends - DNI Definition**
6. **"TAXONOMIES"**
    - **Deployment**
    - **Functional / SMM**
    - → Skills
    - **Systems**
    - **Organizational**
    - **Resources**
7. **Conclusions**
8. **Recommendations**

SKILLS TAXONOMY

[redacted]

[redacted]

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

[redacted]

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

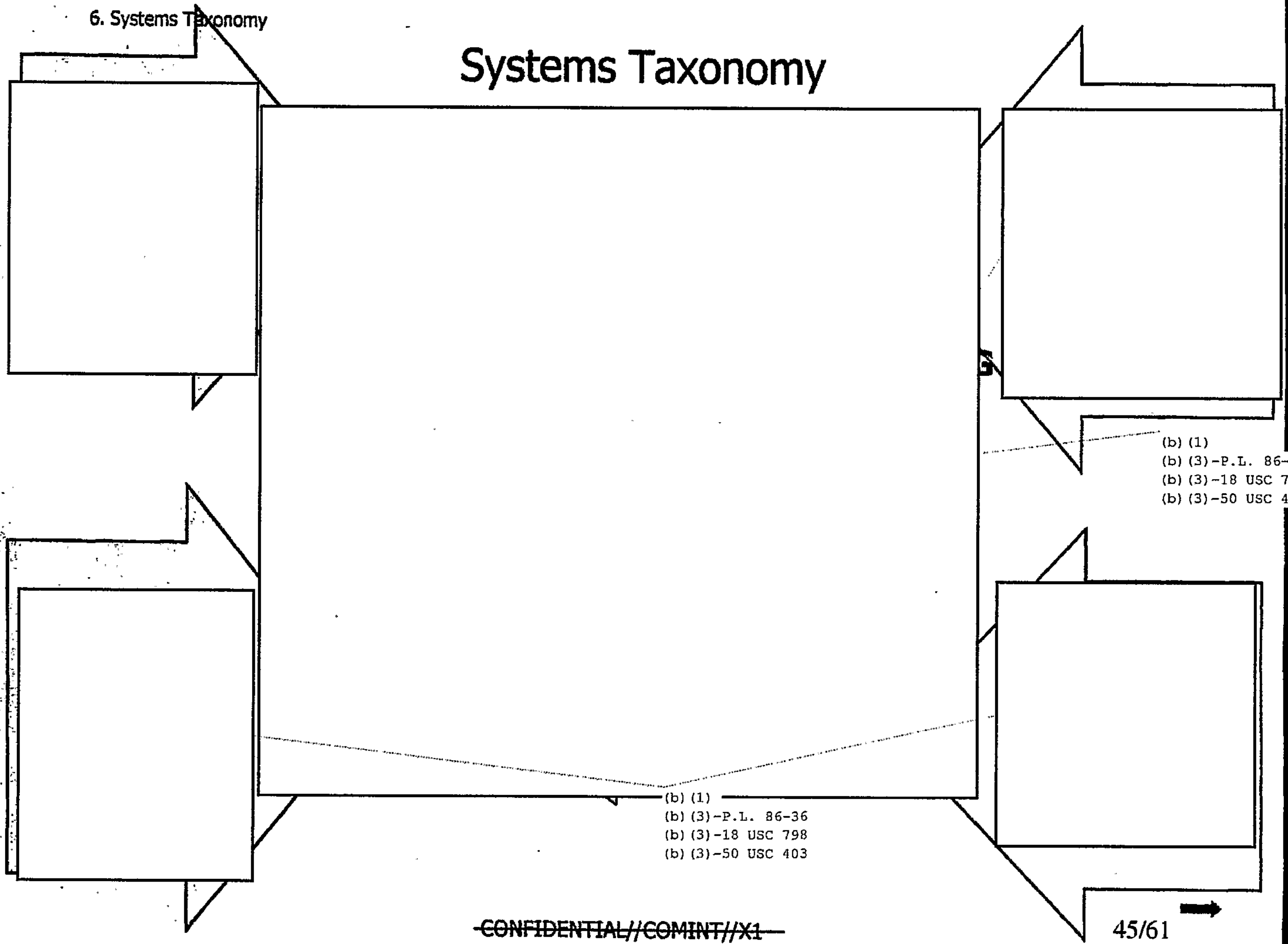
~~CONFIDENTIAL//COMINT//X1~~

AGENDA

1. Purpose
2. Background
3. Definitions and Historical Overview
4. Importance of ‘C2C’
5. Target/Technology Trends - DNI Definition
6. “TAXONOMIES”
    - Deployment
    - Functional / SMM
    - Skills
    - → Systems
    - Organizational
    - Resources
7. Conclusions
8. Recommendations

UNCLASSIFIED

Systems Taxonomy



[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

~~CONFIDENTIAL//COMINT//X1~~

DNI SYSTEMS TAXONOMY - Major Systems

[redacted]

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

~~CONFIDENTIAL//COMINT//X1~~

GRANDMASTER

Description:

[redacted]

Function:

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

Limitations:

[redacted]

(b)(3)-P.L. 86-36 IS NOT THE "GRAND ANSWER"

SARC

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

[redacted]

~~CONFIDENTIAL~~

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

~~CONFIDENTIAL//COMINT//X1~~

AGENDA

1. Purpose
2. Background
3. Definitions and Historical Overview
4. Importance of 'C2C'
5. Target/Technology Trends - DNI Definition
6. "TAXONOMIES"
    - Deployment
    - Functional / SMM
    - Skills
    - Systems
    - → Organizational
    - Resources
7. Conclusions
8. Recommendations

Organizational Taxonomy

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

AGENDA

1. **Purpose**
2. **Background**
3. **Definitions and Historical Overview**
4. **Importance of 'C2C'**
5. **Target/Technology Trends - DNI Definition**
6. **"TAXONOMIES"**
    - **Deployment**
    - **Functional / SMM**
    - **Skills**
    - **Systems**
    - **Organizational**
    - → Resources
7. **Conclusions**
8. **Recommendations**

Resource Taxonomy

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

AGENDA

1. Purpose
2. Background
3. Definitions and Historical Overview
4. Importance of 'C2C'
5. Target/Technology Trends - DNI Definition
6. "TAXONOMIES"
    - Deployment
    - Functional / SMM
    - Skills
    - Systems
    - Organizational
    - Resources
7. → Conclusions
8. Recommendations

UNCLASSIFIED

Conclusions

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

~~CONFIDENTIAL//COMINT//X1~~

Conclusions (Cont'd)

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

AGENDA

1. Purpose
2. Background
3. Definitions and Historical Overview
4. Importance of 'C2C'
5. Target/Technology Trends - DNI Definition
6. "TAXONOMIES"
    - Deployment
    - Functional / SMM
    - Skills
    - Systems
    - Organizational
    - Resources
7. Conclusions

→ 8. Recommendations

UNCLASSIFIED

RECOMMENDATIONS

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

[redacted]

~~CONFIDENTIAL//COMINT//X1~~

RECOMMENDATIONS (Cont'd)

4) Avoid re-inventing the wheel
   - Draw on industry and academia
   - True COTS should always be the first choice

[redacted]

(b)(1)
(b)(3)-P.L. 86-36
(b)(3)-18 USC 798
(b)(3)-50 USC 403

~~CONFIDENTIAL//COMINT//X1~~

A CONCLUDING CONCLUSION

TO DO NOTHING.....

IS NOT AN OPTION

Reactions....

[redacted]

(b)(3)-P.L. 86-36

- SALT Reaction

~~CONFIDENTIAL//COMINT//X1~~