CYBERSECURITY
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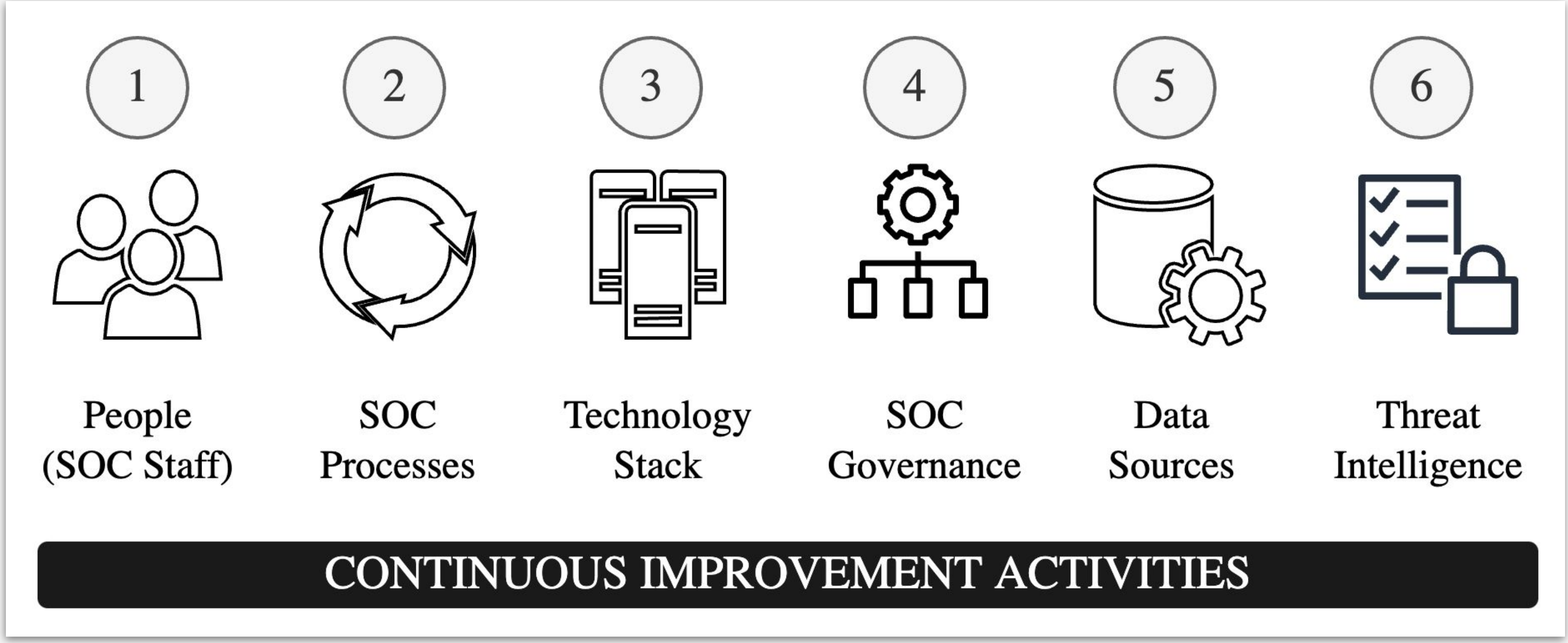
Six essential ingredients of a modern **Security Operations Center (SOC)**

Presented by

Rafeeq Rehman

October 28, 2023

Six Essential Ingredients



1 People (SOC Staff)

2 SOC Processes

3 Technology Stack

4 SOC Governance

5 Data Sources

6 Threat Intelligence

CONTINUOUS IMPROVEMENT ACTIVITIES

1. People

Hiring and retention - the highest issue

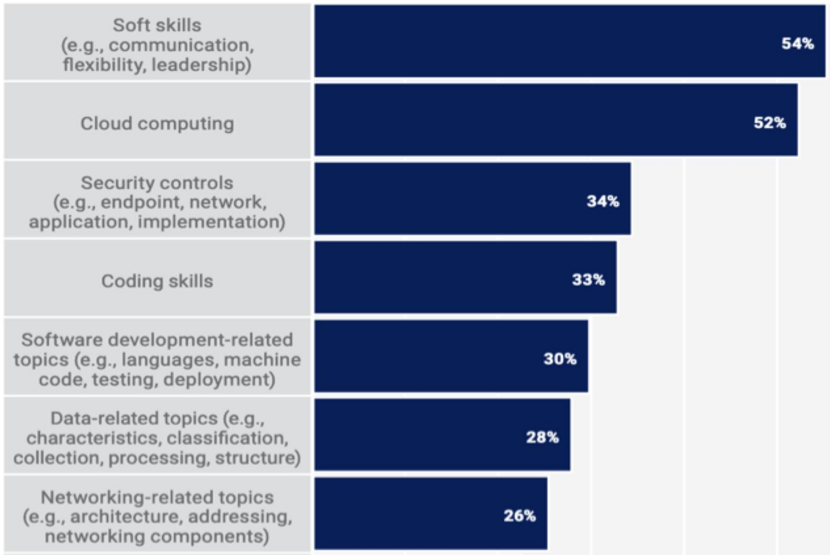
Skill gaps - train, borrow, buy?

The **2022 ISACA Report on State of Cybersecurity** professionals. The biggest skill gap identified in the included “**communications, flexibility, leadership**”

Lack of **business acumen, poor communication,** other factors causing **brand damage of otherwise**

FIGURE 14—QUANTIFIED SKILL GAPS

What are the biggest skill gaps you see in today’s cybersecurity professionals?

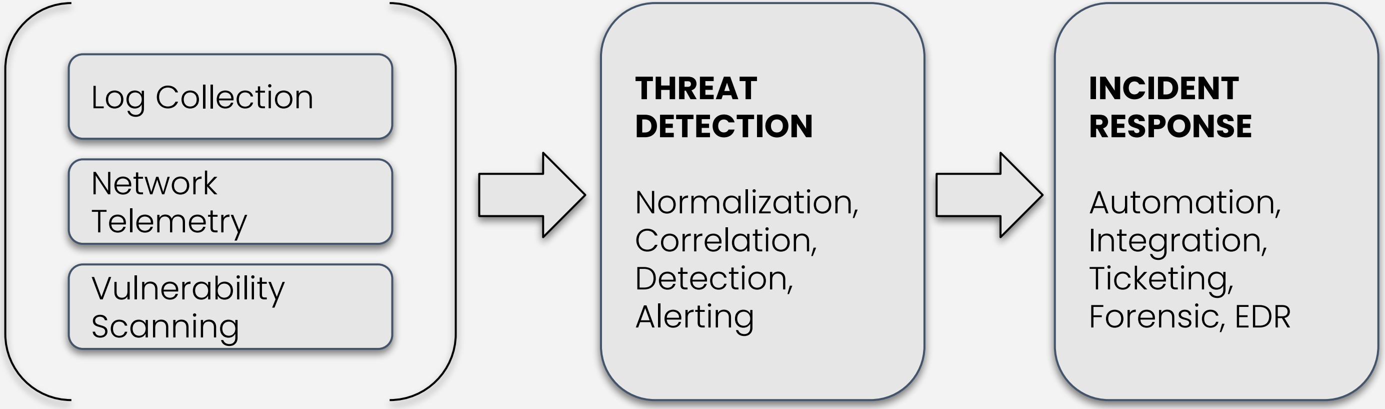


2. Processes

Maturity of processes is a key factor for SOC success.

1. **IT Processes** (patching, upgrades, change management, problem management etc.)
2. **SOC Policies and Standards** (log collection standards)
3. Threat detection process
4. Incident Response process
5. Threat hunting process
6. Use case development process
7. Shift management process

3. Technology Stack



Log Collection

Network Telemetry

Vulnerability Scanning

THREAT DETECTION

Normalization, Correlation, Detection, Alerting

INCIDENT RESPONSE

Automation, Integration, Ticketing, Forensic, EDR

ENABLING TECHNOLOGIES

Servers, OS, Storage, Backup, Encryption, Routers, Switches, knowledge management

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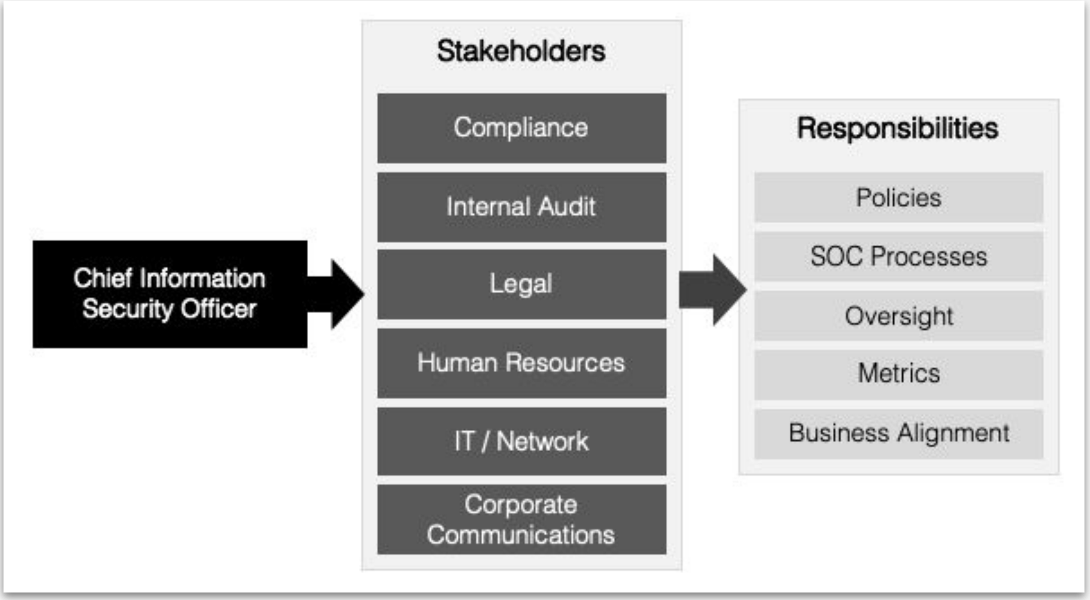
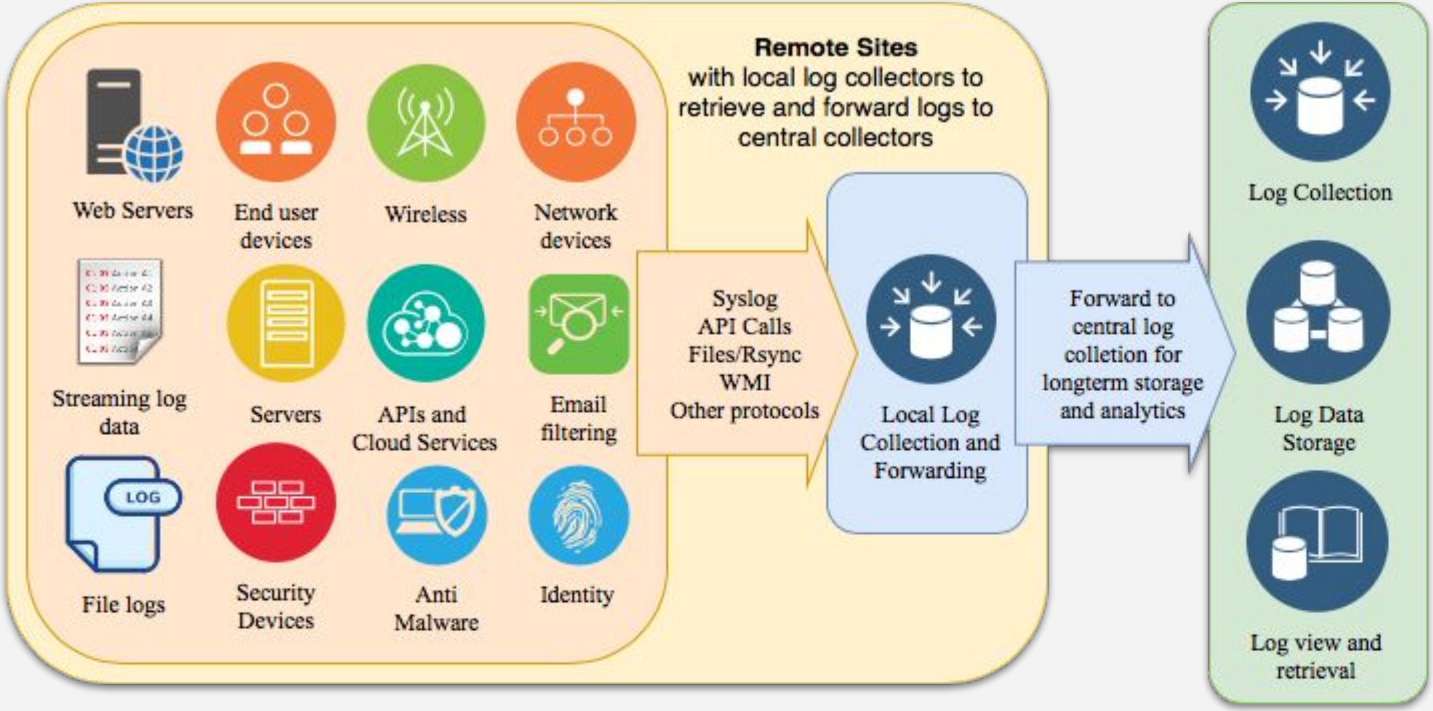
4. SOC Governance

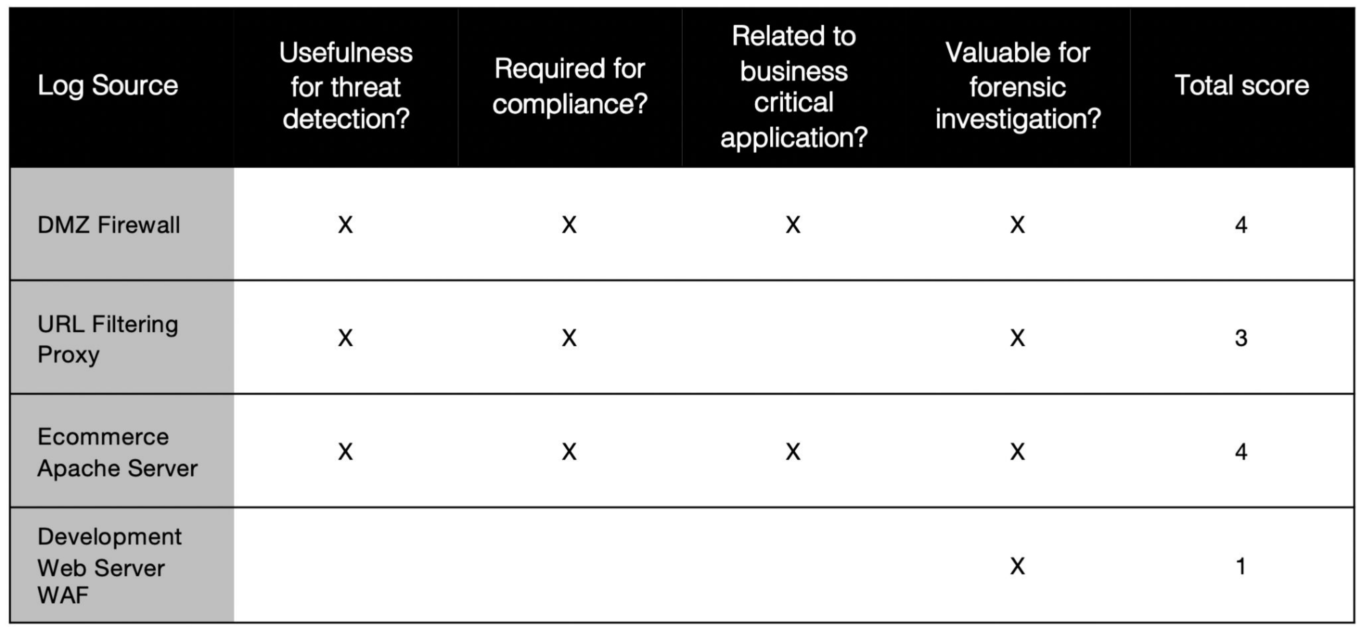
- Governance **board**
- SOC **organizational cha**
- **Business case, finance,**
- **Marketing**
- **Collaboration**



5. Data Sources



5. Data Source – Log Prioritization



Log Source	Usefulness for threat detection?	Required for compliance?	Related to business critical application?	Valuable for forensic investigation?	Total score
DMZ Firewall	X	X	X	X	4
URL Filtering Proxy	X	X		X	3
Ecommerce Apache Server	X	X	X	X	4
Development Web Server WAF				X	1

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6. Threat Intelligence

- STIX and TAXII
- Open and commercial threat intelligence
- TI automation with TIP
- Exploited Vulnerabilities databases and integration into incident prioritization
- Exploit Prediction Scoring System (EPSS)

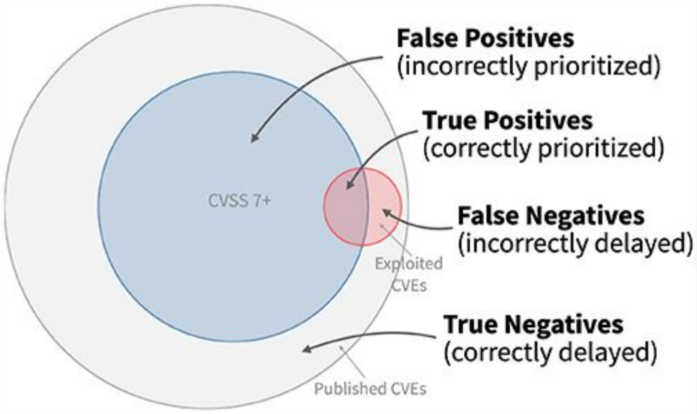
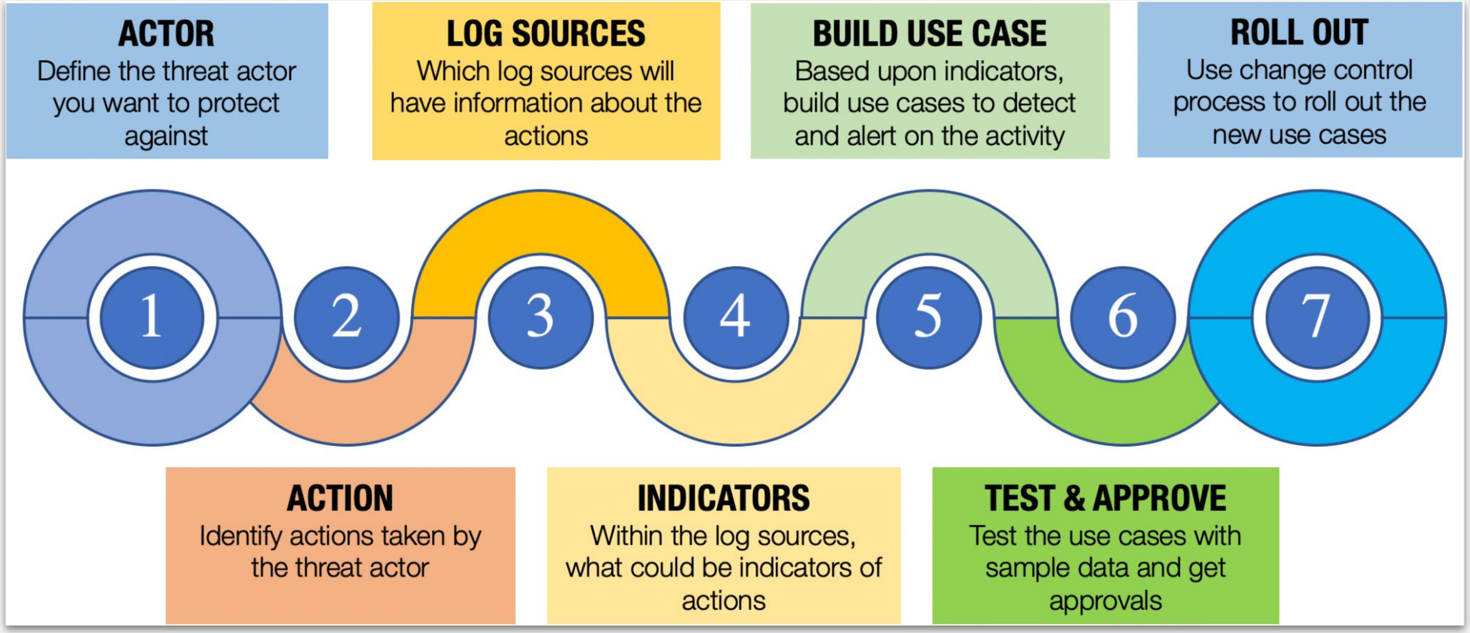


Image reference: https://www.first.org/epss/model

Continuous Improvement

Developing and fine tuning use cases



ACTOR
Define the threat actor you want to protect against

ACTION
Identify actions taken by the threat actor

LOG SOURCES
Which log sources will have information about the actions

INDICATORS
Within the log sources, what could be indicators of actions

BUILD USE CASE
Based upon indicators, build use cases to detect and alert on the activity

TEST & APPROVE
Test the use cases with sample data and get approvals

ROLL OUT
Use change control process to roll out the new use cases

Digging Deeper

Managing SOC Skills

Skill Gaps - Scale of 1-5

	SIEM	Hunting	Linux	Windows	Incident Response	Forensics	EDR	Vulnerability Mgmt
Desired Skill Level	5	4	4	4	3	4	4	5
Available Skill Level	3	4	3	5	2	1	2	4
Skills Gap	2	0	1	0	1	3	2	1

Skill Gaps - Desired and Available Skills

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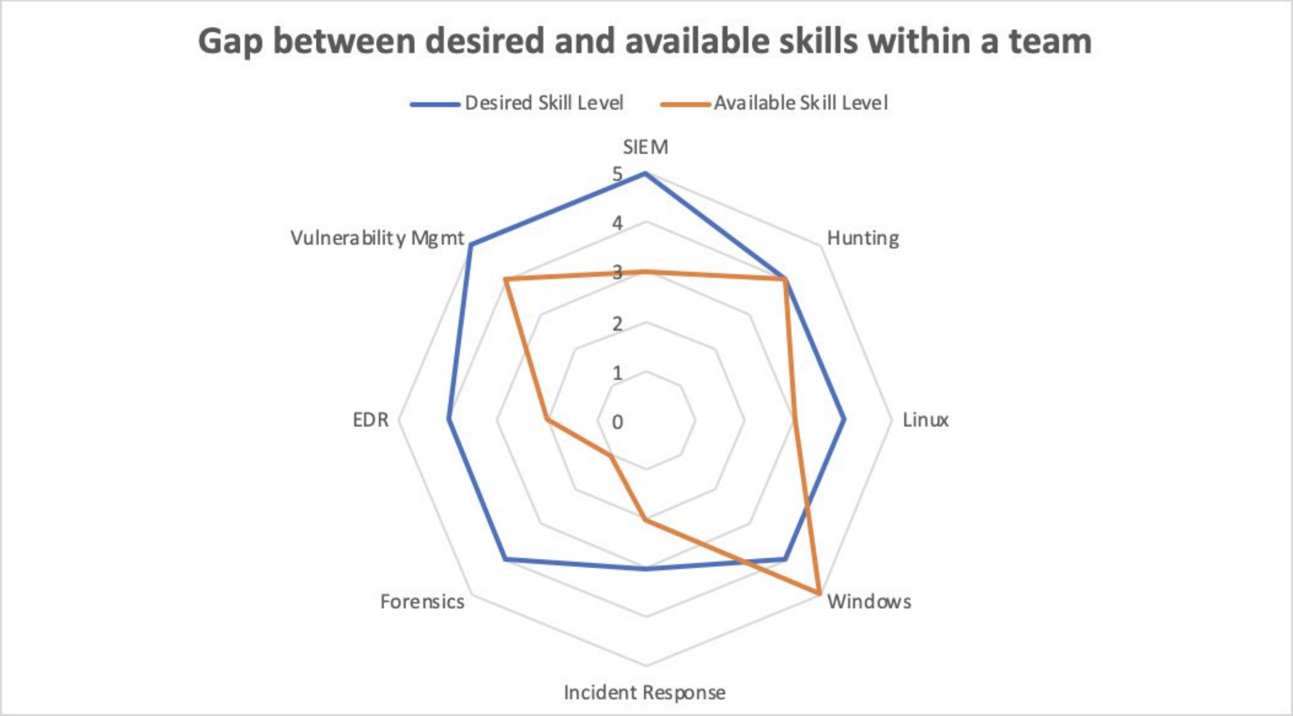

Skill Gaps - Analysis

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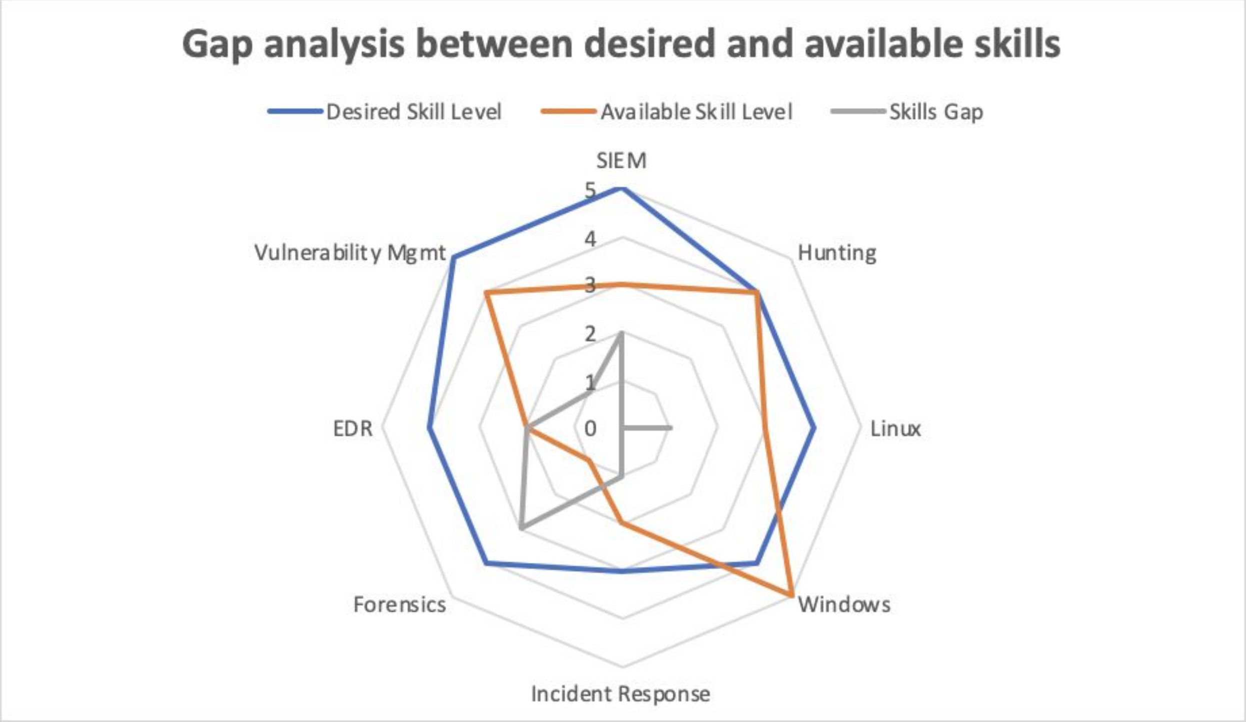

Skill Gaps - Analysis

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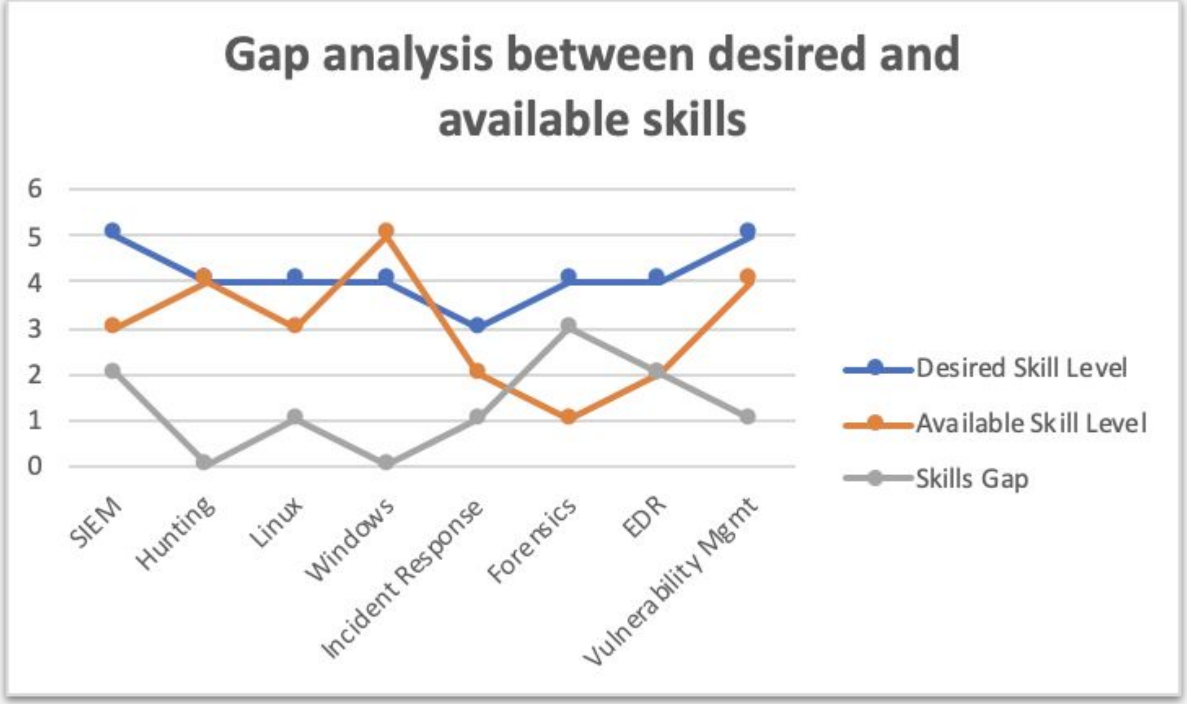

Skill Gaps - Analysis

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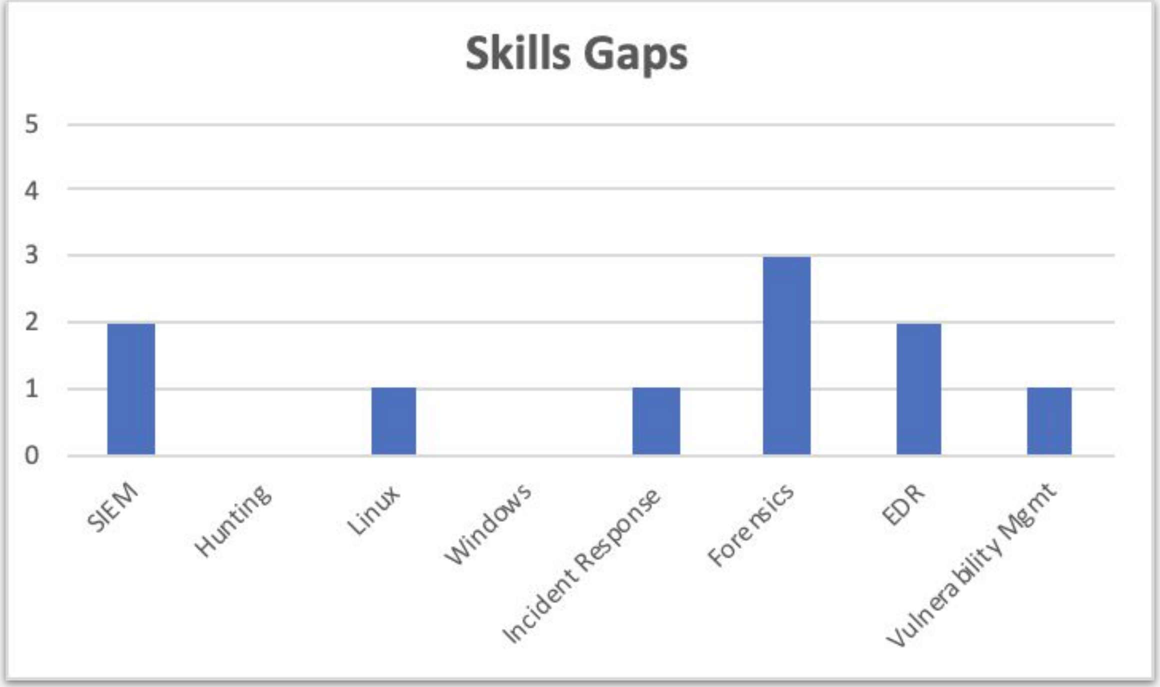

Skill Gaps - Actions

	SIEM	Hunting	Linux	Windows	Incident Response	Forensics	EDR	Vulnerability Mgmt
Desired Skill Level	5	4	4	4	3	4	4	5
Available Skill Level	3	4	3	5	2	1	2	4
Skills Gap	2	0	1	0	1	3	2	1
Action Required	Hire	No Action	Upskill	No Action	Upskill	Hire	Hire	Upskill

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Essential Skills for SOC Staff

1. **Foundational information security principles** (e.g. CIA triad, least privileges, need to know, defense in depth, etc.)
2. **Operating Systems and Cloud -** Linux/Unix and Windows
3. **Networking and application protocols**
   - Very good knowledge of TCP/IP, DNS, HTTP, SMTP, SSH etc. Hands on practice for routers and switches, packet capture, nmap, curl, etc.
4. **Programming** (at least basic level)
   - Shell scripting, Python, C would be great to know, understand how web applications are built, HTML, JavaScript, SQL/Databases
5. **Encryption technologies -** PKI concepts, TLS
6. **Research** – Including LLM tools

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Thank You!

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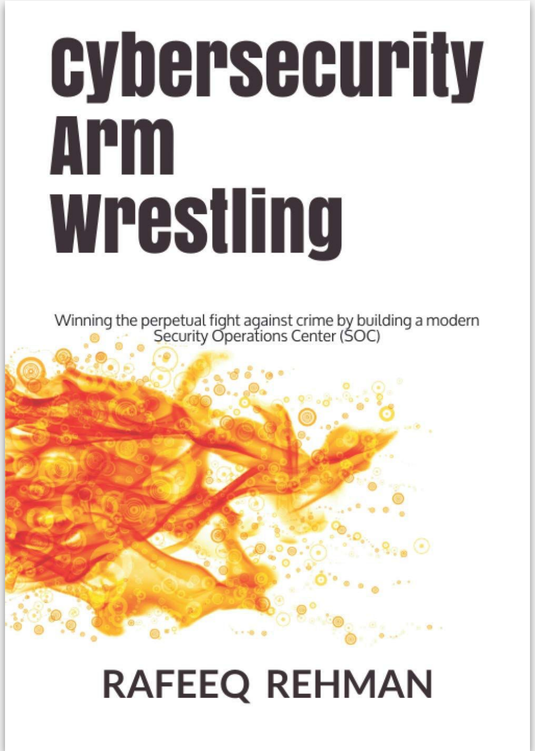
Further Study and Reference

Cybersecurity Arm Wrestling:
Winning the perpetual fight against crime by building a modern Security Operations Center

https://www.amazon.com/Cybersecurity-Arm-Wrestling-perpetual-Operations/dp/B091LWPGCV/



Cybersecurity Arm Wrestling

Winning the perpetual fight against crime by building a modern Security Operations Center (SOC)

RAFEEQ REHMAN

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- This is a learning network supported by volunteers
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- Diverse topics
- Have something to offer? You can volunteer to be a trainer
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