

◆ HARDENING THE DIGITAL MISSION THROUGH SECURE, HIGH-VELOCITY AGILE DEVELOPMENT

Software and Cloud Engineering

```
<- paste(unique_headlines, collapse = " ")
s <- corpus(VectorSource(headline_text))

# Convert to lowercase
# Remove punctuation
# Remove numbers
# Remove common English words
# Remove possessives
# Remove apostrophes
# Remove extra whitespace

document matrix and extract word frequencies
documentMatrix(headline_corpus)
res <- sort(rowSums(as.matrix(tdm)), decreasing = TRUE)
ta.frame(word = names(word_frequencies), freq = word_frequencies)

# Cloud visualization
s = df_words$word, freq = df_words$freq,
freq = 3, max.words = 75, random.order = FALSE,
per = 0, colors = brewer.pal(8, "dark2"))

# missing packages
function/packages() {
packages[!(packages %in% installed.packages()[,"Package"])]
packages)) {
missing.packages:", paste(new_packages, collapse = ", ", "\n")
(new_packages, dependencies = TRUE)

packages
required_packages)
required_packages, library, character.only = TRUE))
```

Engineering secure software, resilient
cloud platforms, and disciplined
development environments.





Mission Success Starts with Secure Digital Engineering

Modern national security missions rely on software that evolves with operational demands. Software and Cloud Engineering delivers secure applications, resilient cloud environments, and disciplined development practices to accelerate capability delivery across complex mission environments.

By integrating software engineering, cloud engineering, DevSecOps, and AI-enhanced development, SPA engineers scalable digital capabilities that deliver the security, reliability, and performance required for mission-critical operations.

◆ Software Engineering

Mission-ready software translates complex operational requirements into secure, scalable applications that advance mission analysis, command and control, and decision-making.

- Develops mission-critical software for complex operational environments
- Designs scalable applications that adapt to evolving mission requirements
- Accelerates agile software delivery

◆ Cloud and Platform Engineering

Cloud and hybrid cloud architectures provide the resilient foundation required to sustain mission systems across dynamic operational environments.

- Engineers resilient cloud and hybrid cloud architectures
- Deploys secure platforms for mission-critical applications
- Hardens infrastructure through integrated cybersecurity

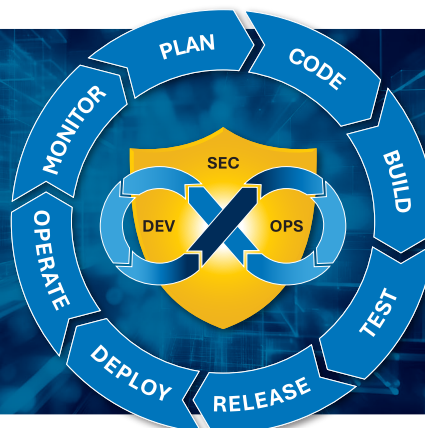
◆ DevSecOps and Continuous Delivery

Integrating development, security, and operations into a continuous engineering process accelerates software delivery while sustaining mission readiness.

- Automates DevSecOps pipelines to accelerate deployment
- Embeds security throughout the software development lifecycle
- Optimizes application performance through AI-enabled development

HOW SPA DELIVERS RESULTS

- ◆ Disciplined software engineering, integrated security, and continuous delivery accelerate mission capability across the development lifecycle.





Engineering Digital Capabilities Across Complex Mission Environments

Software and Cloud Engineering integrates modern software development, cloud engineering, and DevSecOps practices to solve complex operational challenges.

Secure, resilient digital capabilities strengthen mission execution across complex operational environments.

◆ **Adversarial Intrusion Resilience**

Develops high-integrity software for defensive and offensive analysis and simulation while maintaining critical security protections and data integrity.

◆ **Dynamic Hybrid Infrastructure**

Implements resilient cloud-native and hybrid cloud architectures that scale to process next-generation applications, artificial intelligence workloads, and large-scale sensor constellations.

◆ **Disconnected Edge Processing**

Deploys secure, containerized software to edge-computing environments that enable real-time processing in disconnected operational environments.

◆ **Rapid Waveform Adaptation**

Accelerates over-the-air software updates that respond to emerging threat waveforms in hours rather than months.

SPA Fellows



Ian Harding
Fellow, Software Engineering

Leads the design of secure software architectures for enterprise applications, data analytics, artificial intelligence, and decision-support capabilities.



Steven Hernandez
Fellow, DevSecOps and Cloud

Leads secure cloud architectures and DevSecOps practices that accelerate capability delivery across mission-critical space operations.





Real-World Mission Impact



Advancing NATO's Secure Cloud Capability

SPA contributed to the development and implementation of NATO's first cloud operating environment and has led delivery of more than 10 new capabilities. This effort combines user experience design, agile methodology, scalable full-stack development, and secure DevSecOps practices.



Strengthening Space Cybersecurity and Deployment Agility

SPA partners with the U.S. Space Force Command and Control System Program Office to deploy an agile DevSecOps software factory across secure cloud and on-premises environments, providing resilient infrastructure, cybersecurity, and rapid application deployment.



Innovative Software and Cloud Solutions for Mission Readiness

SPA advances digital wargaming and campaign-level modeling and simulation through continuous software development and platform evolution. Enhanced visualization, record-keeping, and adjudication strengthen analytical value across strategic, operational, and tactical environments.

Who We Serve

Office of the Secretary of War

Department of Homeland Security

North Atlantic Treaty Organization

Joint Chiefs of Staff

Missile Defense Agency

Australian Department of Defence

United States Army

Multiple Intelligence Agencies

Australian Department of Home Affairs

United States Navy

National Aeronautics and Space Administration

Australian Taxation Office

United States Marine Corps

Department of Commerce

Australian Department of Health, Disability, and Ageing

United States Coast Guard

Department of Transportation

Services Australia

United States Air Force

Department of Energy

Australian Department of Social Services

United States Space Force

Royal Canadian Navy

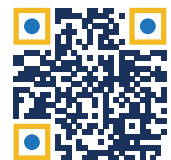
Defense Advanced Research Projects Agency

United Kingdom Ministry of Defence

Defense Threat Reduction Agency

Decision Advantage for National Security

Systems Planning & Analysis (SPA) is a global, independent analytical and technical innovation firm advancing complex national security priorities. SPA delivers mission engineering, advanced analytics, operational insights, and technology-enabled solutions that accelerate capability delivery and inform strategic decision-making across defense, intelligence, homeland security, and other critical mission areas.



spa.com



For more information, email: info@spa.com
2001 N Beauregard Street,
Alexandria, VA 22311
703.931.3500

