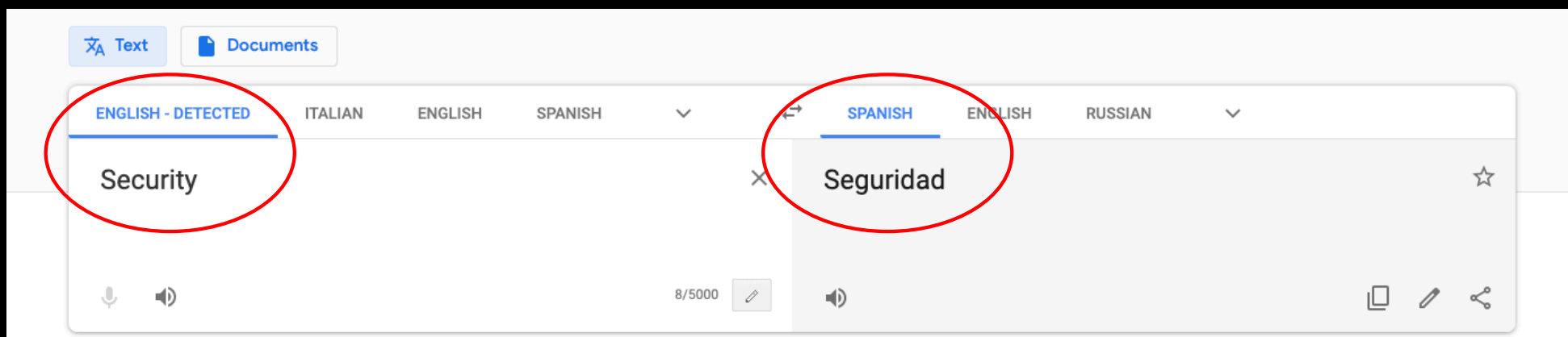
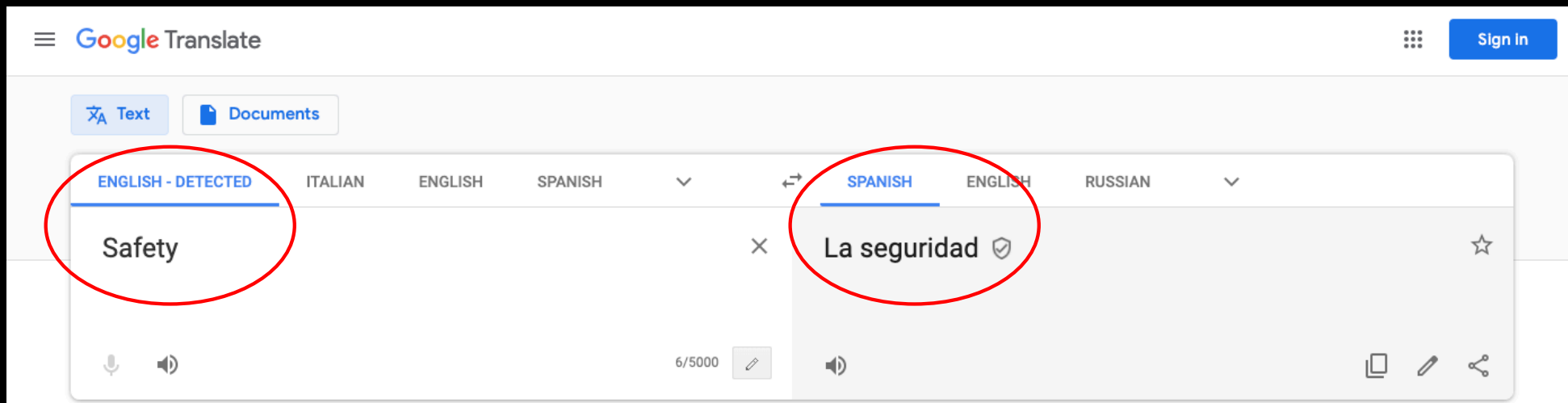


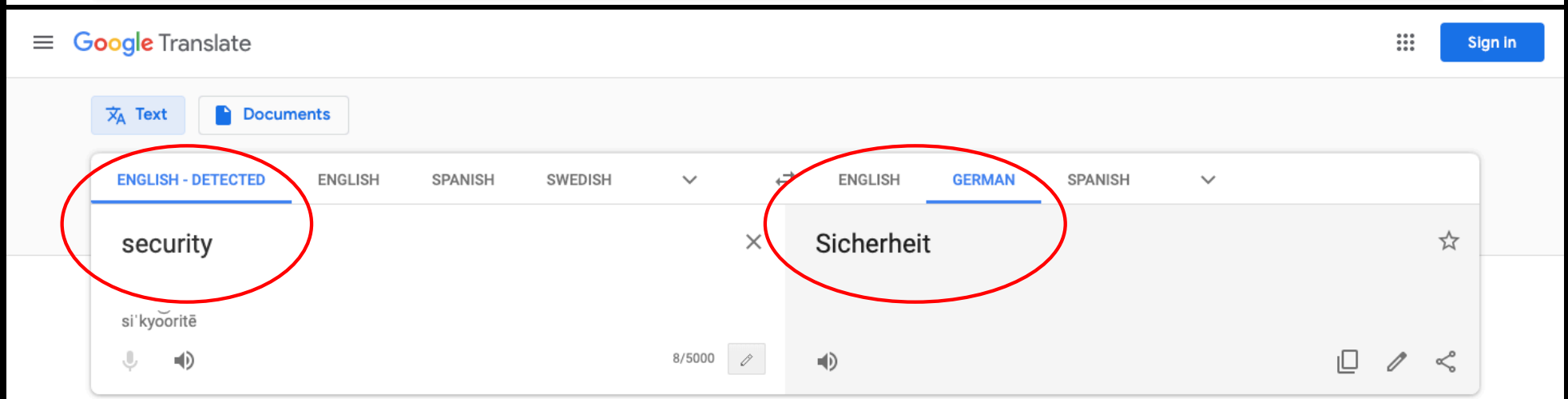
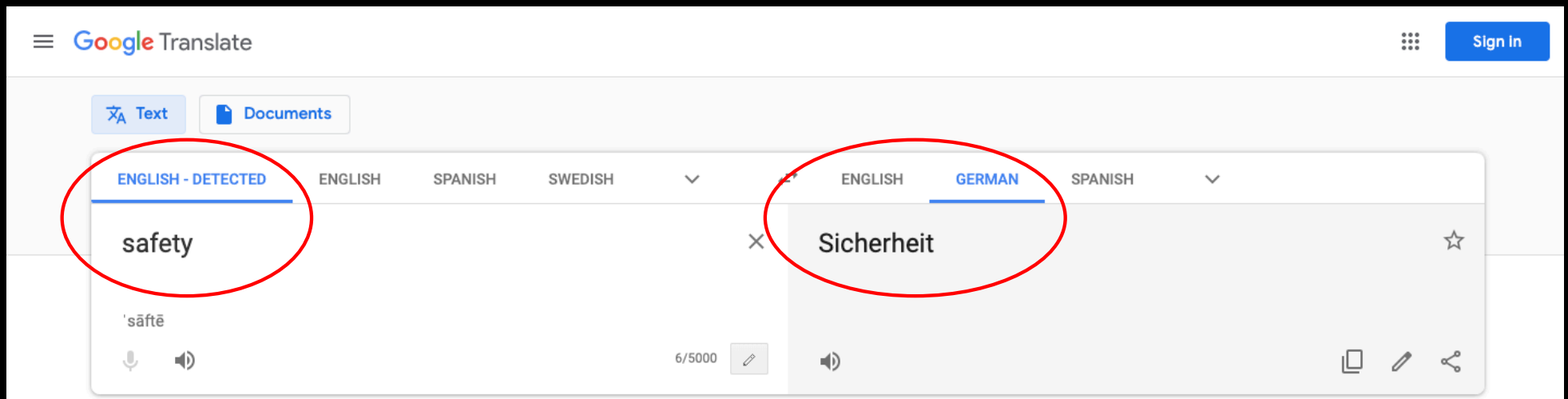


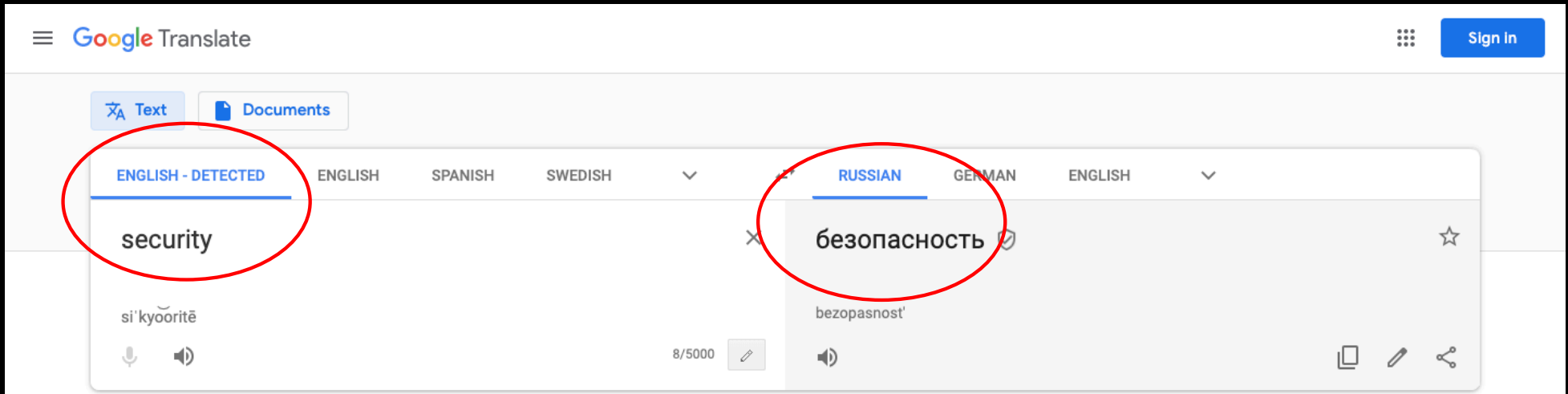
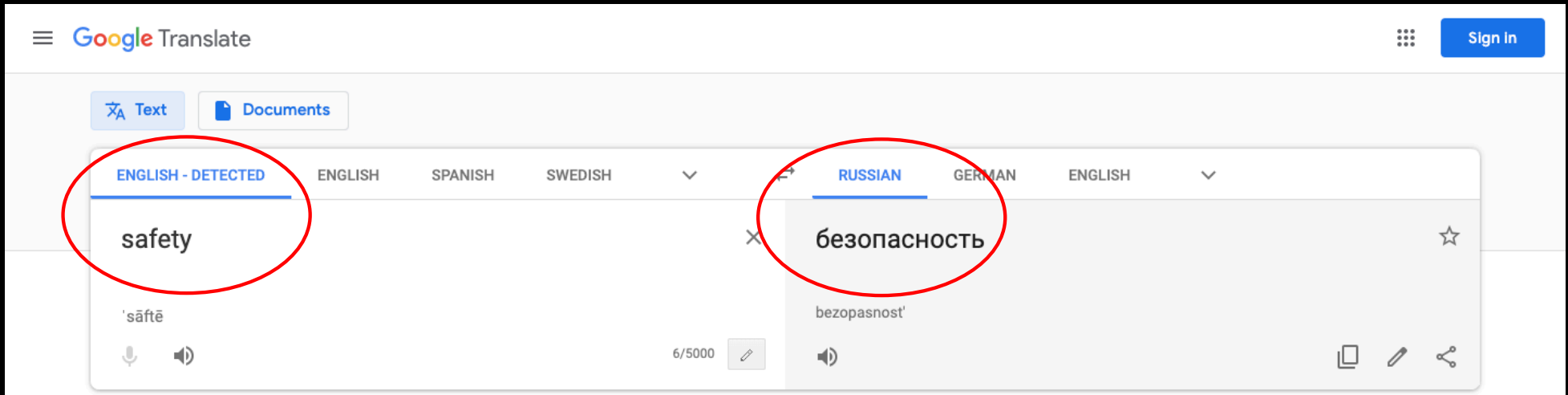
SEGURIDAD Y SEGURIDAD

SAFETY & SECURITY

XIII International Congress of Industrial Cybersecurity in Europe
Centro de Ciberseguridad Industrial - CCI







DEFINITIONS

- **Safety:** Relative freedom from danger, risk, or threat of harm, injury, or loss to personnel and/or property, whether caused deliberately or by accident. *See also security.*
- **Security:** The prevention of and protection against assault, damage, fire, fraud, invasion of privacy, theft, unlawful entry, and other such occurrences caused by deliberate action. *See also safety.*





Safety
Security

DIFFERENCES - SIMPLIFIED

Safety

- “Accident avoidance”
- Focus on loss or damage to life or property
- Can be the result of a security failure
- Easy to use is often safer to use
- Keeping the product from affecting the environment
- Protecting people from the machines

Security

- “Crime prevention”
- Focus on availability, integrity and confidentiality
- Can escalate into a safety issue
- Easy to use is often exploitable
- Keeping the environment from affecting the product
- Protecting the machines from people

DIFFERENCES - EXAMPLES



- **Safety** requires emergency exits
- Must be easy to exit by **anyone**
- **Security** would prefer only a wall with no door (access point)
- Should be locked and only **authorized personnel** with access can enter or exit

BOTH ARE COMPONENTS OF RISK

Risk Management: **Risk = Probability x Severity**

- **Probability** for **Safety** Risk Management is a function of design – material selection, tolerances, design margin, and a function of manufacturing (things that are easily estimated)
- **Probability** for **Security** Risk Management is a function of motivation – financial gain, mayhem, and a function of opportunity, open vulnerabilities (things are not easily estimated or even known)
- **Probability** for **Safety** Risk Management largely stays the same over time, and only change as the design or manufacturing changes
- **Probability** for **Security** Risk Management can immediately change from “Low” to “Frequent” once an exploit is known/available

SAFETY VS. SECURITY

- Goals can be **contradictory**
 - Control system access control: group or individual?
 - System complexity: segmentation and more technology
- Does one have more **importance** than the other?
 - Can take over security interface to disable safety measures
 - Car-to-car connection for safety exploited through security vulnerability to cause harm
- Security must be functional to guarantee safety
- Security is the process for **ensuring** safety
- Balancing both should be the **objective**, but this is very **difficult** to achieve

TECHNOLOGY PATH

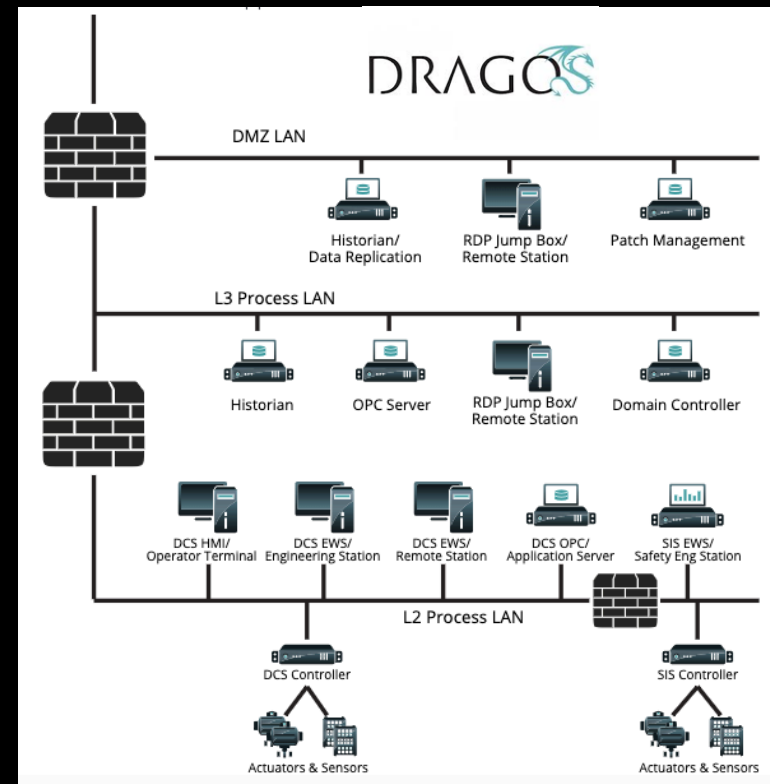
- Safety and security technologies are **increasing** in use
- Most future technologies will be **digital and connected**
- Digital systems bring new **risks**
 - More attack surface area
 - Access and availability
 - Data integrity: sensor, aggregator, annunciator/alarming
 - Data storage, reconnaissance and inference

EXAMPLE: TRITON/TRISIS/HATMAN



SEPARATING SECURITY AND SAFETY

- Logical **separation** of security systems and safety systems is now required
- Safety and security **manual/physical** processes still matter



SAFETY AWARENESS

- Everyone knows that **safety is everyone's job**
- How many days since **last incident**?
- How many **hours** of required training to perform job?
- Safety marking, paint, signs, posters, tailboard sessions
- "Safety minute"
- **Culture** of reporting and improvement
- KPI(s) for **management**
- Can **reflect** poorly on insurance, stock, etc

SECURITY AWARENESS

- Emails that everyone **ignores**
- Intranet messages that everyone **ignores**
- Videos that everyone **ignores**
- Phishing tests that everyone **fails**
- Training that everyone **hates** and puts off until last minute
- Weak passwords that everyone **reuses** everywhere
- Culture of "**do not talk**" about security incidents
- Can **reflect** poorly on insurance, stock, etc

INTEGRATED APPROACH FOR SUCCESS

- Manage security and security risks in an **integrated** manner; they support each other
- Use same/similar **approach** for security awareness that is used for safety awareness
- Make it **personal**; tie it to their life in some way
- Use operational content and messaging staff will **recognize** and understand (identify with)
- Foster **culture** of reporting, metrics and improvement
- Give both the same degree of visibility and responsibility at **executive** level

IT IS ALL RISK MANAGEMENT

- What is your risk tolerance for **safety**?
- What is your risk tolerance for **security**?
- Are they **different**? Why?
- **Measure, message and manage both programs similarly**







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