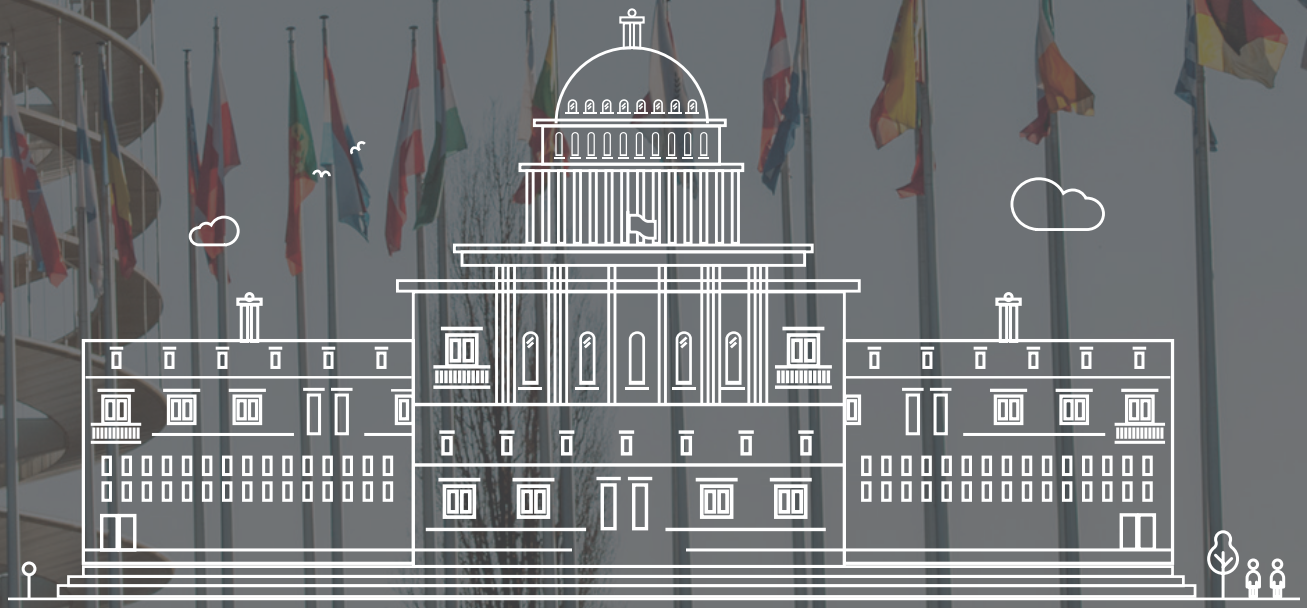
UK Edition

Privacy in Public Administration



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Technological Technocracy

The public sector is undergoing an unprecedented transformation as new technologies are now used across the board to increase efficacy.

Implementing new technology is one of the key factors in improving processes and growing the economy. Despite the recent austerity measures leading to a reduction in overall Government spending, it still makes up 40% of the UKs GDP. This level of public sector spending rate is lower than the EU average of 48%, it still underlines the extent to which our lives are influenced by public administrative bodies.

Use of information and communication technologies in general and specifically, online government services, are key factors in the way the public sector is changing, as it delivers fast access to public services for both individuals and businesses.

However, **the adoption of new technologies by public agencies has also exposed them to new types of threats** - There is a real and ever-present threat of cyber-attacks to these online services.

The UK National Cyber Security Centre (NCSC) are reporting twice as many cyber incidences across the board with 200 national security-level cyber incidents per month targeted at government operations and critical infrastructure.

The healthcare sector alone, according to information released by the Information Commissioner's Office, saw 184 total breaches between January and March 2016. As the NHS handles some of the most personal and sensitive data that people will have, breaches can cause people to suffer a huge amount of problems and distress.

The NCSC is looking at ways to further protect the nation, including a nationwide DNS filter to 'firewall' the UK.

The technological revolution in the public sector, the digitalization and storage of information, and the boom in online services to simplify administration have led to an exponential growth in the generation, storage and processing of confidential data; data which must be treated with the utmost care. Consequently, the public sector now faces a new series of demands in risk prevention, security and legal compliance.

Many public bodies have implemented new technologies without paying the necessary attention to these demands; The National Audit Office are recommending they have to undertake a major effort to adapt to the new legal landscape.

The role of cyber-security

Cyber-threats represent a constant and significant security risk for public administrations. So much so, that they have become a powerful weapon to attack the citizens and public agencies of nation states. Such threats can seriously affect the quality of services, safety and steal confidential information, from private data to state secrets.

Today's digital society is the main beneficiary of these technological advances, yet it must also use these resources responsibly and effectively. Cyber-security is a key factor in improving user experience, complying with legislation and providing the protection needed by public entities.

Initially, the main approach to IT security reactively protecting information, but this has evolved towards a more proactive approach, identifying and combating cyber-threats.

Security, in any dimension or context, is the first responsibility of any government. Historically, security was managed by Defense departments, given that the main perceived threats to countries were of a military nature. In the present hyper-connected era, however, new players and risks have emerged that have forced governments to undertake major reviews and shakeups of their security and defense policies.

With an additional £1.9 billion cyber investment, in the latest he Spending Review, the government has made clear this is a class-1 threat, an additional 1,900 staff will be recruited to GCHQ to keep Britain safe from cyber terrorist attack.

Such a shift is reflected in new requirements with government demanding suppliers are compliant with Information Security Management ISO 27001 to ensure they have formally reviewed all security and reporting procedures.

In the Queens speech the Digital Economy Bill dictates the right for every household to access high speed broadband and reform the way government uses data to delivery public services and also to strengthen protection for citizens in the digital world.

The government is also under consultation for 'Better use of data in government' which sets out sets out proposals for new legislation that addresses data sharing in government for several purposes: improving public services, tackling fraud and debt, and improving the use of data for research and for official statistics.

Cyber-attacks:

Data theft

UK HM Revenue and Customs

Over the last ten years we have witnessed all types of attacks against public administrations. One example from 2007, was two hard disks from HM Revenue and Customs with the personal data of families with children under 16 in the UK were lost. Apparently, a courier firm had been entrusted with the disks, though they never reached their destination. The 25 million missing records included names, addresses, dates of birth and bank details. Not learning from this the Ministry of Defense suffered three separate incidents across 2008, they managed to loose four hard-disks, a USB drive and a laptop containing over 2 million records of applicants and included sensitive information about the private lives of senior staff.

Data lost of all UK families with children.

Israel's Ministry of Social Security and Welfare

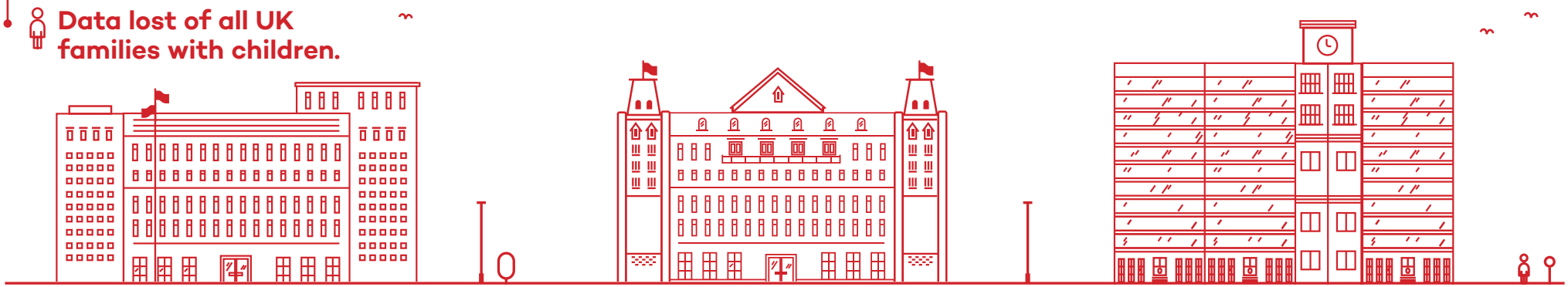
Another case was between 2005 and 2006, involved Shalom Bilik, a computer systems maintenance contractor for Israel's Ministry of Social Security and Welfare. Bilik accessed a database and stole information pertaining to nine million Israeli citizens. The information was later sold and the theft went undiscovered until 2012, when Bilik and five other people involved in the processing and sale of data were formally charged.

Data stolen from 9 million Israeli citizens.

United States Department of Veterans Affairs

Not even our own homes are secure and even less so when it comes to the safekeeping of state documents. There is a lesson to be learned from the employee of the United States Department of Veterans Affairs whose house was robbed in May 2006, compromising the data of 26.5 million veterans, including their name, social security number and date of birth. The employee had been working on a statistical survey and had taken the information home without permission.

Data of 26.5 million veterans were compromised.



The White House

In 2015, Ben Rhodes, deputy national security advisor in the United States, confirmed that the White House had been the victim of an IT attack. In an interview with CNN, Rhodes acknowledged that the attackers gained unauthorized access to the unclassified computer system and stole key data. The classified system was not hacked.

The Office of Personnel Management

In June of the same year, it was reported that the Office of Personnel Management, the U.S. federal government's human resources agency, was compromised and the personal information of at least 4 million public workers stolen. The attack took place two months earlier, about the same time that the White House was compromised. Both attacks, however, appeared not to be connected.

Access to the unclassified computer system.

Access to personal data from 4 million of public workers.

Insiders

As was the case in many other sectors, most examples of data theft up until 2011 were inside jobs, carried out by employees with access to information. Attacks from employees with privileged access are one of the greatest threats to the cyber-security of countries and businesses alike. Whether it's a foreign spy, an employee kidnapped by terrorists or disgruntled employees simply stealing information out of spite, they are all insiders.

Bradley Manning

One of the most infamous data thefts of the modern era occurred in 2010, when Bradley Manning, a US soldier, copied 700,000 confidential documents and used WikiLeaks to publish the data. In total almost **half a million records from the Iraq and Afghanistan conflicts, and more than 250,000 secret U.S. diplomatic cables.** Manning has consequently been charged with misconduct for violating federal laws on the disclosure of classified material, supplying intelligence to the enemy, breaching IT security and hacking security programs as well as espionage.

Indirectly this was also led to WikiLeaks Editor-in-Chief Julian Assange taking refuge in the Ecuadorian embassy since August 2012 as he fears extradition to the US, with the cost of policing to the UK tax-payer exceeding £10million.

He copied 700,000 confidential documents.

Edward Snowden

Another of the most notorious cases in recent years and one that had both the CIA and the NSA in a state of alarm featured Edward Snowden, a former employee of the latter, who in 2013 published top secret documents through the Guardian and the Washington Post, concerning various NSA programs, including the mass surveillance program PRISM.

The United States Department of Justice has determined Snowden's participation in the surveillance program PRISM as a "criminal matter", his eventual fate is anyone's guess.

Snowden published top secret documents, concerning various NSA programs.

Attacks against networks and systems

As technologies advance and systems become more interconnected, cybercriminals have more means and tools to carry out attacks, as has become clear thanks to the numerous cases occurred in recent years.

In 2012, a simple email message sent to employees of the South Carolina Revenue Department gave an attacker access to the internal network and the data of 3.8 million taxpayers. The stolen information included social security numbers and bank account details.

A similar attack took place in Monterey County, when the personal details of 145,000 residents were stolen by external attackers who managed to compromise a computer in the Social Services Dept. Once again, the data stolen included social security numbers, along with names and addresses.

An email message gave an attacker access to the internal network and the data of 3.8 million taxpayers.

Social security numbers and bank account details, were stolen.

Politically-motivated attacks

The year 2015 witnessed scores of politically-motivated attacks against public institutions (including the hacking of social network accounts to spread propaganda), as well as spying on politicians and high-ranking officials.

Cyber-terrorism and cyber-espionage

Organized criminal networks (cyber-gangs) have begun to shift the focus of their activities towards cyber-space, taking advantage of the anonymity of the Internet in order to obtain sensitive information which can then be used fraudulently for financial gain.

In January 2015, just as Barack Obama announced a series of legislative initiatives to help in the fight against cyber-crime, a group of attackers with connections to ISIS seized control of the Pentagon's main social network accounts. To do so, they must have had access to details of email accounts, passwords, usernames, etc. Data and credentials that typically don't have the level of security necessary to prevent attacks and misuse.

Now terrorists and extremist groups are using cyber-space to plan attacks, publicize them and recruit supporters to carry them out.

This tactic was used by the group known as the Syrian Electronic Army, which managed to compromise the website of the US Navy, publishing propaganda in favor of Assad's Syrian regime.

The US administration once again became the target of cyber-criminals when James Comey, head of the FBI, told a security forum that they had detected a growing interest among terrorists in strategies for launching cyber-terror attacks against the United States. Without going into details about the type of attack, he said it appeared they were still in the early stages of planning and assessing how effective they might be. Nevertheless, this is potentially an issue that could have serious repercussions.

With the sabotage of industrial installations, assassinations of scientists and **the use of the Stuxnet computer virus, the secret phase of the war against Iran began during the last decade** with the spying by the US and Israeli intelligence services, who reached the conclusion that Iran had developed a uranium enrichment plant. This finally came to light in September 2009 after an announcement by Barack Obama.

Hacktivism

This movement really arose during 2011, when hacktivism became a serious threat to governments and public agencies. Its fundamental principles are anonymity and the free circulation of information across cyberspace, essentially through the Internet. Hacktivists have a decentralized structure, using underground networks to communicate and plan their actions.

The German parliament was the victim of an attack that compromised various computers and stole information from them. The attack is suspected to have come from Russia, although it is difficult to prove who was really behind the action.

On July 25, 2015, various Russian hackers were able to compromise the Pentagon's unclassified email system and steal information. According to official sources, it was the result of a highly sophisticated attack and was clearly engineered by a government.

Similarly, this year three groups of Latin American attackers managed to compromise the mail servers of the Bolivian army, downloading emails, some of which they published. They accessed the information with ease through an old security hole in the Zimbra VMWare service that army security technicians had omitted to patch.

Public administrations around the world, and in particular defense and national security services, are well aware of the risks they face. In 2016, **the US Department of Defense presented a pilot bounty program called "Hack the Pentagon," where rewards are offered to encourage hackers to find security flaws in the Pentagon's website, applications and networks.**

Russian hackers compromised the Pentagon's unclassified email system.

Latin American attackers compromised the email servers of the Bolivian army.

Despite the investment in cyber-security made by the U.S. government, one of the most recent attacks to come to light is the one that targeted the Democratic National Committee, which has acknowledged that its systems were compromised for at least a year. Evidence has been found to suggest that the attackers belong to Russian intelligence services, and that they have had access to emails, chats and a variety of research documents. All the computers in the committee's research department had been accessed and some files stolen.

In a similar vein, this July, a total of 19,252 emails and 8,034 attachments from the US Democratic National Committee sent between January 2015 and May 2016 were revealed on Wikileaks. The security company contracted by the Democratic National Committee has claimed that **the hack was the work of at least two different groups of hackers linked to a Russian government agency in an action designed to favor Republican candidate Donald Trump.**

Now, three months before the US elections, the FBI has confirmed the hacking of at least two electoral databases by foreign hackers who have extracted voter information from at least one of them. There is an ongoing investigation and IPs have been traced back once again to Russian hacking forums. Coincidence?

To prevent new attacks on public agencies, a common regulatory and legislative framework is needed, with responsibilities shared between states, bilaterally or through supranational institutions.

A year without protection

Democratic National Committee systems were compromised for at least a year.

19,252 emails with 8,034 attachments

from the US Democratic National Committee were revealed.

Two electoral databases were hacked

by foreign hackers who have extracted voter information.

Legislative Changes

Changes to the regulatory framework implemented by the European Union in 2016 were the result of the administration's need for effective resources and sufficient capacity to respond to the continuing (and constantly increasing) incidents caused by cyber-attacks. There was also a shortage of cyber-security experts, which was not being addressed by either public or private sector training.

Other factors that have led to this change in the security framework include the fact that, as illustrated above, the security of a nation is no longer limited to the defense of its borders and sovereignty, but also to ensuring the welfare of its society in the face of new risks.

One of the principal aims of The Data Protection Act is to guarantee and protect, with regard to the processing of personal data, public freedom and the fundamental rights of individuals, and especially their personal privacy and that of their family.

This regulation deals with an essential factor in increasing the capabilities of mobile technology and data analysis and processing used by governments and by most companies: cloud computing. Customers who contract cloud computing services remain responsible for the processing of personal data.

The party providing the service is a service provider who, according to the Data Protection Act, has the role of "data processor".

With respect to the physical location of the data, countries within the European Economic Area offer sufficient security guarantees, and data transferred between countries is not considered legally as an international transfer of data. The European Economic Area consists of the countries of the European Union along with Iceland, Liechtenstein and Norway.

Microsoft promoting their position as the first hyper-scale cloud-services provider able to provide UK based datacenters.

Technology and Legislation

The emergence of new players from different backgrounds and with varying motivations combined with their ability to act in any security dimension, hinders the identification of aggressors and decreases the ability of countries to adequately respond. Current legislation is not adapted to the new cyber-crime dynamic or to new technological or data management demands.

In July 2016, **the European Parliament established new rules to bolster the EU's efforts against cyber-threats.** The Directive on Security of Network and Information Systems, aims to raise standards in cyber-security and strengthen cooperation between Member States in these areas, while establishing new obligations for operators of essential services and critical infrastructures (energy, transport, health and finance) as well as for digital service providers (online marketplaces, search engines and cloud services).

The Directive also requires each state within the EU to set up national agencies and to develop a strategy to address cyber-threats in accordance with the directive, which will no doubt lead to an overhaul of National Cyber-Security Strategies. It also proposes to create a network of "Computer Security Incident Response Teams" (CSIRT) in order to develop both confidence and security among member states, and promote rapid and efficient operational collaboration.

One example of this is that essential services operators must immediately notify the competent authority or CSIRT of any incidents that have significant effects on the continuity of the essential services they provide. Digital service providers should respond in a similar way when an incident has a significant impact on the provision of the services covered by the Directive (online marketplace, search engines and cloud computing services).

It is therefore important to pay close attention to this new European cyber-security regulation, which will inevitably give rise to new national standards and the adaptation of others currently in force.

Of course **much of the UKs inclusion within European legislation depends on exactly what the government decide Brexit means.**

Cyber-security experts are now warning governments and citizens of the importance of protecting Internet systems and implementing tighter security than ever before, as, if action is not taken, the future consequences could be dire.

The solution for adapting to the change

Administrations are now promoting a shift away from a cyber-security model focused on protecting information (Information Security), towards a comprehensive security model based on the management of cyberspace risks (Information Assurance).

For public institutions, success in ensuring cyber-security lies with meeting certain requirements:

Real-time information

Having real-time information about incidents and security holes related to data security, such as the accidental or illegal destruction, loss, alteration, unauthorized disclosure or remote transference of data.

Data Protection Regulation

Compliance with Article 35 of the "General Data Protection Regulation" on data protection with regular and systematic monitoring of data on a large scale.

Foreign Report

Reporting all possible transfers of data files to foreign countries.

Privacy

Improving individual rights, including the right to be forgotten, and data portability across all shared data files.

Safeguard

Safeguarding delegation to other processors of data deletion, reporting and notification requirements, and the maintenance of file transfer activities.

Adaptive Defense 360

In the case of the Electronic Administrations under a national security framework, it determines some specific requirements, at all levels, and the use of different technologies to prevent vulnerabilities that can undermine several lines of defense at the same time.

To this effect, the implementation of advanced technologies such as Adaptive Defense, as a complement to traditional antivirus solutions or perimeter security, enables compliance with the Spanish ENS and the technical requirements outlined above, since **Adaptive Defense offers guaranteed security against threats and advanced targeted attacks on companies via four basic pillars:**

Visibility:
Traceability and visibility of every action taken by running applications.

Detection:
Constant monitoring of all running processes and real-time blocking of targeted and zero-day attacks, and other advanced threats designed to slip past traditional antivirus solutions.

Response:
Providing forensic information for in-depth analysis of every attempted attack as well as remediation tools.

Prevention:
Preventing future attacks by blocking programs that do not behave as goodware and using advanced anti-exploit technologies.

Adaptive Defense protects computers by only allowing legitimate software to run, while monitoring and classifying all processes running on a customer's infrastructure based on their behavior and characteristics. It also provides monitoring tools, forensic analysis and incident resolution to determine the extent of any problems detected and how to resolve them.

Unlike traditional antivirus software, **Adaptive Defense leverages a new security model that allows it to adapt precisely to the specific environment of each company,** monitoring the execution of all applications and constantly learning from the actions triggered by each process.

After a brief learning period, Adaptive Defense 360 is able to offer levels of protection way above those of traditional antivirus products, as well as providing valuable information regarding the context in which security problems occur, in order to determine their scope and implement preventative measures.

Adaptive Defense is a multi-platform service that supports Windows, Linux, Mac OS X, and Android. As it is hosted in the cloud, there is no need for investment in additional IT infrastructure, ensuring a low TCO.

As a cloud-based managed security service, the National Security Framework (ENS) requirements are the direct responsibility of the service provider. **Panda Adaptive Defense is hosted on Microsoft's Azure cloud.**

Microsoft Azure has undergone rigorous testing by BDO, an independent auditor, who has officially certified compliance. BDO certifies that the security measures of the service, as well as those of the IT Systems and installations for processing data, offer high level compliance with RD 3/2010, with no need for remedial measures. Microsoft is the first hyper-scale cloud services provider to receive this certification in Spain.

Finally, and with respect to laws on Protection of Personal Data in force in different countries, it is important to underline that Adaptive Defense does not gather any personal data and under no circumstances does it send personal data to the cloud, thereby ensuring compliance with current and future data protection legislation.

Protection against advanced threats and targeted attacks, with the ability to detect anomalous behavior. A system for ensuring data confidentiality, information privacy and safeguarding an organization's assets and reputation. All that is Adaptive Defense, the only advanced cyber-security system that combines next generation protection with the latest detection and remediation technologies able to classify all running processes.

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