Psychology of Security

Security as human behaviour and experience

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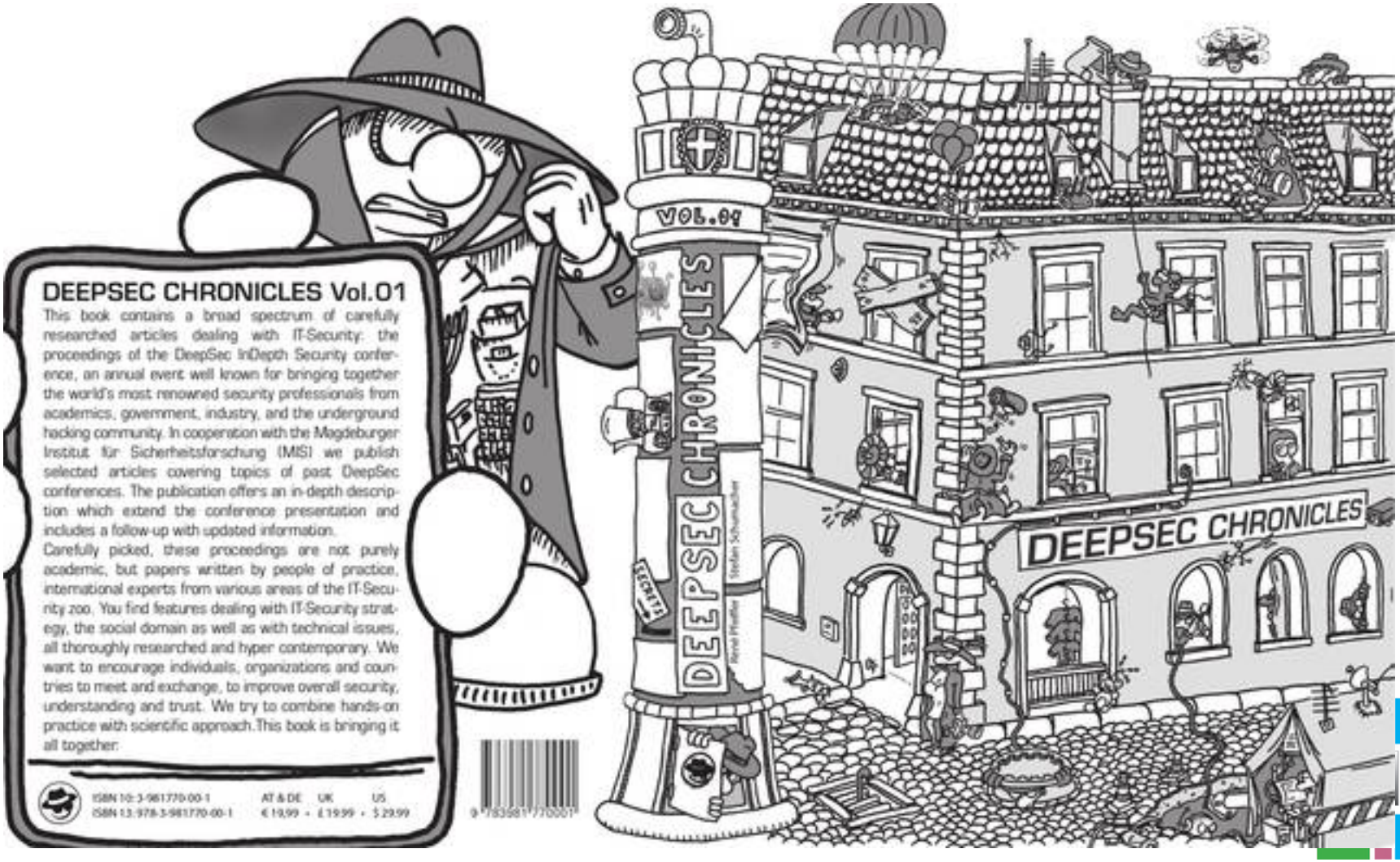
About Me



About me

- President of the Magdeburg Institute for Security Research
- Editor of the Magdeburg Journal of Security Research
- Freelance Security Consultant
- Hacker for 20 years, ex-NetBSD developer
- Educational Science and Psychology, Research on Social Engineering
- Focus on Social Engineering, Security Awareness, Organizational Security




DEEPSEC CHRONICLES Vol.01
This book contains a broad spectrum of carefully researched articles dealing with IT-Security: the proceedings of the DeepSec InDepth Security conference, an annual event well known for bringing together the world's most renowned security professionals from academics, government, industry, and the underground hacking community. In cooperation with the Magdeburger Institut für Sicherheitsforschung (MIS) we publish selected articles covering topics of past DeepSec conferences. The publication offers an in-depth description which extend the conference presentation and includes a follow-up with updated information.
Carefully picked, these proceedings are not purely academic, but papers written by people of practice, international experts from various areas of the IT-Security zoo. You find features dealing with IT-Security strategy, the social domain as well as with technical issues, all thoroughly researched and hyper contemporary. We want to encourage individuals, organizations and countries to meet and exchange, to improve overall security, understanding and trust. We try to combine hands-on practice with scientific approach.This book is bringing it all together.
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DEEPSEC CHRONICLES

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ToC

1 Intro

2 Fundamental Research

3 Organizational Development and Security

4 Cultural Differences

5 Didactics of Security

6 Knowledge Base



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Do you think there is something like »felt security« / »a windchill factor of security«?

Yes, of course. Every perception is filtered through our limbic system.



Do you think there is something like »felt security« / »a windchill factor of security«?

Yes, of course. Every perception is filtered through our limbic system.



Question

- Who thinks they can wash their hands?
- Who thinks they can desinfect their hands?



Question

- Who thinks they can wash their hands?
- Who thinks they can desinfect their hands?
- Why do you wash your hands?



Question

- Who thinks they can wash their hands?
- Who thinks they can desinfect their hands?
- Why do you wash your hands?



Psychology

- empirical and theoretical science
- describes, explains and predicts human behaviour and experiences
- human development and the internal and external causes and conditions
- Differential and Personality P., Social P., Industrial P., Organisational P., Pedagogical P.



Psychology and IT-Security?

Security is a latent social construct and has to be treated as such.
Psychological and sociological methods and tools are required. If the security of a system should be enhanced, a diagnosis, prognosis and intervention is required.



Latent Social Construct

- Construct: cannot be directly measured
- can only be measured by using manifest variables to estimate the latent variables
- examples: Intelligence: Phrenology or IQ-Tests
- security cannot be measured directly
- operationalisation of security required



Security and Psychology

- Security is concluded by making Decisions
- Individuals make decisions based on their Biography, the Situation and how they perceive their Environment
  see: von Foerster, Luhmann, Spencer Brown, Baecker et.al.
- Psychology is the Science which researches these Topics.
- Therefore, Psychology is *required* to research Security.
- Psychology is the only Science able to research the basic fundamentals of Security.



Washing your Hands

- More pregnant Women died in the Vienna General Hospital than in a Monastery
- Ignaz Semmelweis discovered that Physicians transmit pathogenic agents
- He proposed that Physicians should wash their Hands
- His Idea was rejected and he was considered to be somewhat crazy
- This can only be explained by Psychology



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1996: Ariane 5 Flight 501



320 000 000 Euro

Some Examples

- Users choose weak Passwords ...
- Users are not interested in Security ...
- Users don't understand Security ...
- Programmers create Buffer Overflows and forget safety Regulations ...
- Admins forget to patch ...
- Developers use MD5 as Password Hash ...
- Social Engineering
- Security Awareness



Research Programme

- Vienna Programme for Cyber-Peace
- introduced last year
- Psychology of Security is part of it
- 3 years estimated
- currently started



What do we need?

- Fundamental Research about the Perception of Security
- Fundamental Research about Personality / Attitudes and Security
- Organizational Development and Security
- Cultural Differences
- Didactics (Teaching Methodology) of Security
- What to teach?



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Perception of Security

- radical constructivistic approach
- each Individual perceives the World in one's own Way
- shaped by one's former experiences
- We have to explore this Worldview in depth
- by qualitative Research



Perception of Security

- different Tools and Methods exist
- several qualitative/semi-structured Interviews are lead with different interviewes
- eg. autobiographic-narrative Interviews with Hackers and Users
- Expertinterviews with Hackers and Researchers
- What shapes a Hacker's mind?
- How do Users perceive IT-Security?
- How can this Perception be changed?
- Are there Science based Security Awareness Tools?



Riskhomeostasis

- Risk behaviour is controlled by different Variables
- Self-perception, subjective Skills, objective Skills, Perception of Risk, Risk acceptance
- Researched in Industrial Psychology: Air Traffic Controller/Pilots, Workers in Nuclear Power Plants, Motor Vehicle Operator ...
- Study: East German Taxi Drivers switched from Wolga to Mercedes and had more accidents



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Personality and Security

- Different Theories of Personality exist
- We use empirical sound Tools to examine Personality Traits and security relevant Behaviour
- Personality Traits are very stable over Lifetime
- quantitative research
- Big5: Neuroticism, Extraversion, Openness, Conscientiousness, Agreeableness
- Motives: Power, Achievement Orientation and others
- How do they correlate with security relevant behaviour?



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Organizational Development

- Security is a huge and hot Topic in Companies
- lots of Money is spend on Security Awareness and Training
- lots of different Methods exist eg. in Knowledge Management, Leadership, Organizational Development
- Which of them are useful for security relevant Behaviour?
- Strict Hierarchies can be easily attacked with Social Engineering ...



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Cultural Differences

- Culture influences Organisations and Individuals
- What are the differences? How can they influence Security?
- eg: How is the TVET system organizes? Is there a TVET System? On the job training? Only colleges?
- Lots of Tools and Methods exist, Research Results also
- Can they be transfered to our Problems?



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Didactics

- Didactics is the Science of Learning and Teaching
- Teaching Methodology
- very well researched in Germany due to the dual TVET System
- well funded and empirical sound
- several curriculums for IT skilled labour exist
- how can they be enhanced with IT security



How?

- How can we teach Security?
- Which Methods work best under which Circumstances?
- E-Learning? Blended Learning? Only Facts? Theory? Practical Approach?
- Culture is relevant
- well researched Model of Competencies/Capabilites is used in Germany
- not only facts are taught, but also studying and research methods
- independent learning is emphasized
- trainees learn *how* to keep their knowledge up to date
- trainees have to be able to know *what* to learn



How?

- How can we use this Model of Competencies/Capabilites?
- What are the best Methods to develop those Competencies?
- action oriented teaching? project work? masterpieces?



Who?

- Who has to learn about IT Security?
- Sysadmins, Developers, End Users
- create different roles
- determine what each role has to learn



What

- What to teach and learn?
- Who needs to understand Elliptic Curve Cryptography? Webmaster? Sysadmins? End Users?
- Who needs to understand what?
- How do we test that?
- When and How do those Curriculums and Tests need to be revised?



Web based teaching

- Part of the Programme
- modularized Curriculum
- adapted for different Roles
- different web based Methods including Mobile Learning
- including tests and certification



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Getting Knowledge

- Too much information is floating around
- too old information, which is obsolete and outdated
- false information
- find methods to identify correct knowledge
- create a knowledge base?
- who decides about the contents?
- empower users to identify correct/required knowledge?



What to do?

- Finish fundamental research
- Discuss what to teach
- Research cultural Differences
- Find adequate teaching Methods



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