# Shadow IT Mindsets of Corporate Employees

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Jan van Acken
j.vanacken@uu.nl

PhD student
Software Ecosystem Security group
Utrecht University

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See table on p.20 for precise attributions

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# Definitions

## MINDSET:

- (mental) representation of concepts or ideas
- shorthand for reality $\implies$ reducing complexity

## SHADOW IT:

"hardware, software, or services built, introduced and/or used for the job without explicit approval or even knowledge of the organisation." [Haag and Eckhardt, 2017]

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# Shadow IT Topology

| Type | Description |
|---|---|
| Unapproved cloud services | Use of Internet-based Software and Software as a Service (SaaS) that are not approved or unknown by the IT department. (...) |
| Self-made solutions | Use of solutions developed by employees on the company's computers to perform their work tasks. For example, an Excel spreadsheet or an application developed by employees. |
| Self-installed applications | Use of software installed by employees to perform their work tasks on the company's computers. For example, downloading and installing software available free of charge on the internet. |
| Self-acquired devices | Use of devices owned by employees. These devices are purchased directly from retail rather than being ordered through the official catalog of the IT department. It includes the use of applications in the employee's personal devices at the workplace. |

Shadow IT topology – [Mallmann et al., 2019]

# Motivation
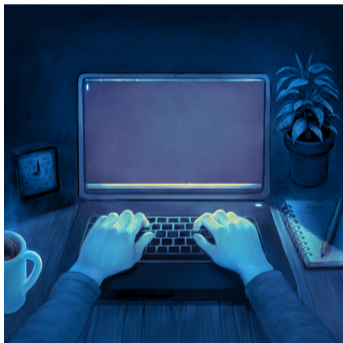


## Shadow IT

- Not a new trend!
  [Zimmermann and Rentrop, 2012]
- Almost any company using IT might face shadow IT

## Shadow IT as a threat?!

Search & destroy approach, reduce threats *for now*

## Shadow IT as an indicator

- What can we handle differently?
- What are your users working around?

## Full Publication:

Who is the IT Department Anyway: An Evaluative Case Study of Shadow IT Mindsets Among Corporate Employees



(a) Jan van Acken

(b) Floris Jansen

(c) Slinger Jansen

(d) Kate Labunets

**Focus:** implications of shadow IT mental models for a large organization

See the full paper: usenix.org/conference/soups2024/presentation/van-acken

# Questioning Shadow IT in Companies:

### Research Question I – SURVEY

How does SHADOW IT usage differ between DEPARTMENTS and RANKS?

### Research Question II – INTERVIEW

How do employees perceive SHADOW IT and risks associated with its usage?

### Research Question III – INTERVIEW

Which MINDSET motivates employees to opt for (or against) SHADOW IT usage in an organisational context?

Overview & Definitions
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Research
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Mindsets
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Conclusion
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Sources
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## Study Context

- Dutch branch of a large professional services organisation, 5k+ employees

- DEPARTMENTS: Client-facing, Support, IT, Management
- RANKS: Junior, Senior, Manager, Senior Manager, Management

- SURVEY on shadow IT usage ($n = 450$)
- Follow-up INTERVIEWS ($n = 32$)

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# Survey Result: Usage Percentage *Any* Shadow IT Per Scenario
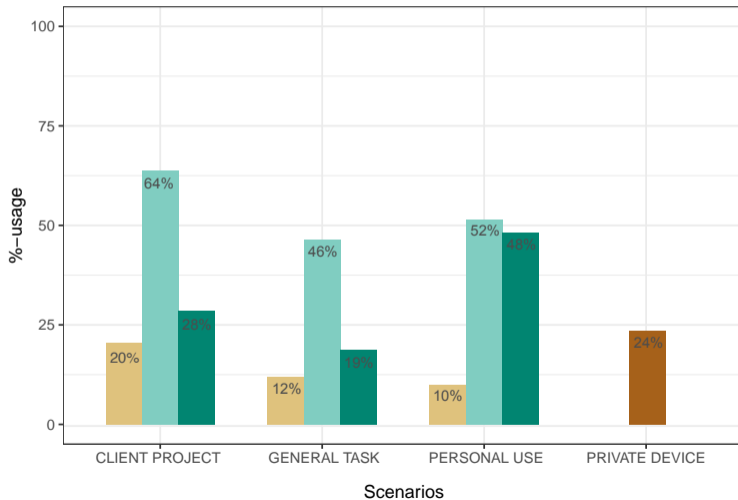


Figure: Rate of participants using at least one form of shadow IT. Grouped by scenarios, plus the rate of reported private device usage overall. (n=450)

## Interview Components:

| | Junior | Senior | Manager | Senior manager | Management | **Total** |
|---|---|---|---|---|---|---|
| Client-facing | 6 | 4 | 5 | 6 | - | 21 |
| Support | 1 | 2 | 3 | 1 | - | 7 |
| Management | - | - | - | - | 4 | 4 |
| IT | 0 | 0 | 0 | 0 | - | 0 |
| **Total** | 7 | 6 | 8 | 7 | 4 | **32** |

### Topics covered

- understanding of shadow IT
- reasons for using shadow IT
- perception of shadow IT usage implications
- awareness of relevant organizational policies
- how shadow IT is discussed amongst colleagues
- how well-informed about shadow IT

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## General Observation: What Drives Shadow IT Usage

- Approved solutions fail to meet functional needs

- Work requirement / client project demand

- Existing habits, convenience

- Overcoming *limitations* of current IT environment

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# The 10 Mindsets

### Risk-Averse

1. Consequence Avoidance Orientation
2. Knowledge-Based Conservatism
3. Risk Transfer Mindset
4. Cautious-Seasoned Judgement

### Risk-Taking

5. Common Sense Fallacy
6. Illusion of Self-Sufficiency
7. Misguided Sense of Protection
8. Performance-Driven Rule Bending
9. Longevity-Based Invincibility
10. Cost-Driven Compromise

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# Risk-Averse Mindsets - 1 & 2

### CONSEQUENCE AVOIDANCE ORIENTATION

"*Think about all the consequences. I think those hold the biggest risks. Which is also the reason I don't have anything external*" –P19

### KNOWLEDGE-BASED CONSERVATISM

"*I am very aware of all sorts of risks. It is because of my role as [role]. So, therefore, I am aware of certain things that the average Joe here won't think of*" –P7

# Risk-Averse Mindsets - 3 & 4

**RISK TRANSFER MINDSET**

"*I would try and let the client take responsibility for the risk. Because they are the ones asking for this tool.(. . . )*" –P22

**CAUTIOUS-SEASONED JUDGEMENT**

"*I have seen it all, but actually you should go through a data breach once just to see how bad it really is. After that, you'll think twice about your actions. You learn this through trial and error over the years*" –P30

# Risk-Taking Mindsets - 5 & 6



**COMMON SENSE FALLACY**

"*Look, in our department, they just expect you to know this stuff. (. . . )*" –P18

**ILLUSION OF SUFFICIENCY**

"*(. . . ) we have everything taken care of*" –P6
"*(. . . ) we have everything that we need*" –P19

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# Risk-Taking Mindset - 7

## MISGUIDED SENSE OF PROTECTION

"(. . . )I think they watch what you downloaded, and if it is not okay then maybe it will go through a system that detects this, or maybe there is a team that reads everything, and you then get a message to delete it from your machine"    –P15

"And also you get a warning I think at [organisation] if you have something on your system which is not good [...]"    –P5

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## Risk-Taking Mindset - 8



### PERFORMANCE-DRIVEN RULE BENDING

"*I cannot explain to a client that certain tasks have not been completed. This means that sometimes employees enter a grey area, perhaps even cross it by doing what they shouldn't.* "     –P20

"*The main issue with that is that the show must go on*"     –P20

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# Risk-Taking Mindsets - 9 & 10

**LONGEVITY-BASED INVINCIBILITY**

"*We've used it for so long without any issues (. . . ) sometime a while ago it was introduced and it has stayed up until now (. . . ) over time it has grown to what it is now for us.*"   –P12



**COST-DRIVEN COMPROMISE**

"*I wonder about, for example [tool], since we used it because it provides a free package. One might wonder how good that is (. . . )*"   –P5

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## What To Do About Shadow IT?

- Accommodate employees' perspective and needs
  - usable software & security, useful training
  - safe space for employees to communicate their tech needs
- Targeted Shadow IT awareness training
  - tailor training to the need of roles, departments, mindsets
- Shadow IT protocols to navigate *rule bending* situations
- Track long-term instances
  - Once found: try uncovering the reasons for adoption!

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# Call For Input

### What's on your mind about mindsets?

Best practice how to VALIDATE?
How to differentiate from BIASES?
Is the set EXHAUSTIVE?
Any relations to existing models from YOUR field?
How to model INTERACTION between mindsets?
Glaring omissions?
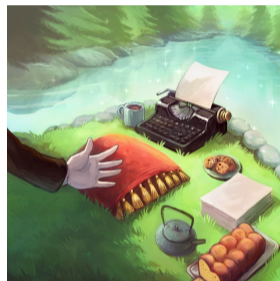


Feel free to get in touch!
Mail: j.vanacken@uu.nl
Mastodon: @jpvanacken@scholar.social

### LOOKING FOR HOST

Could you imagine having me over
for a research visit at your group?

## Image sources

| Slide | Reference |
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