

Public



Supplier Risk Management @ ASML

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19 april 2018, Vianen

Challenge in Information Security



Ever increasing computing power is to the security of the connected world as the invention of gun powder to the city wall.

ASML in 34 years



1984



2018

- 0% market share
- Employees: 31
- Locations: 2 (NL, US)
- Sales: € 1,2 million
- R&D: € <5 million

- Employees:> 19.000, 115 nationalities
- Locations: 60, in 16 countries
- Sales: € 9,053 billion (end 2017)
- R&D: € 1,260 billion (end 2017)

ASML develops & makes machines that make chips

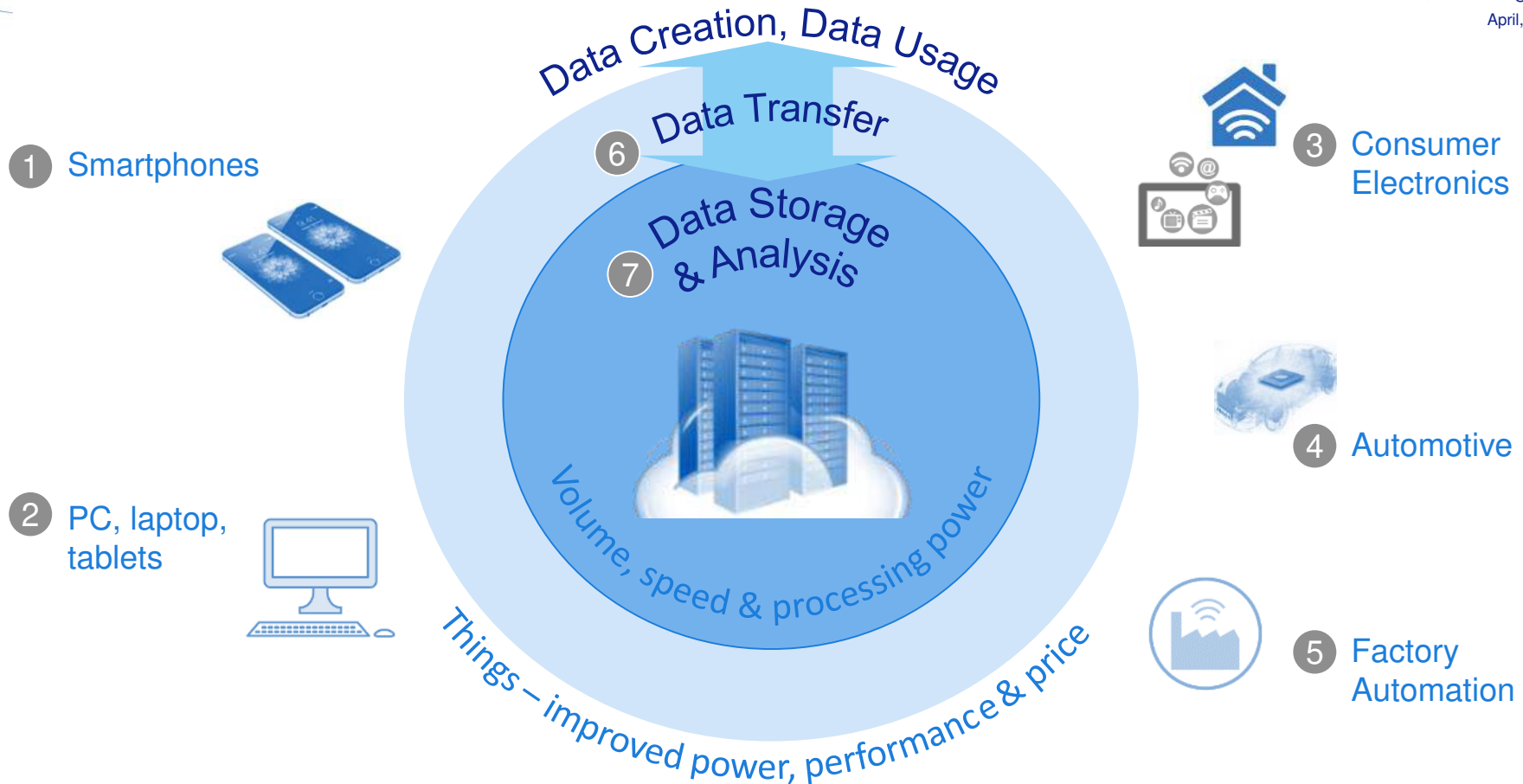
That's a 100-ton, €95-mln precision instrument with >100,000 components



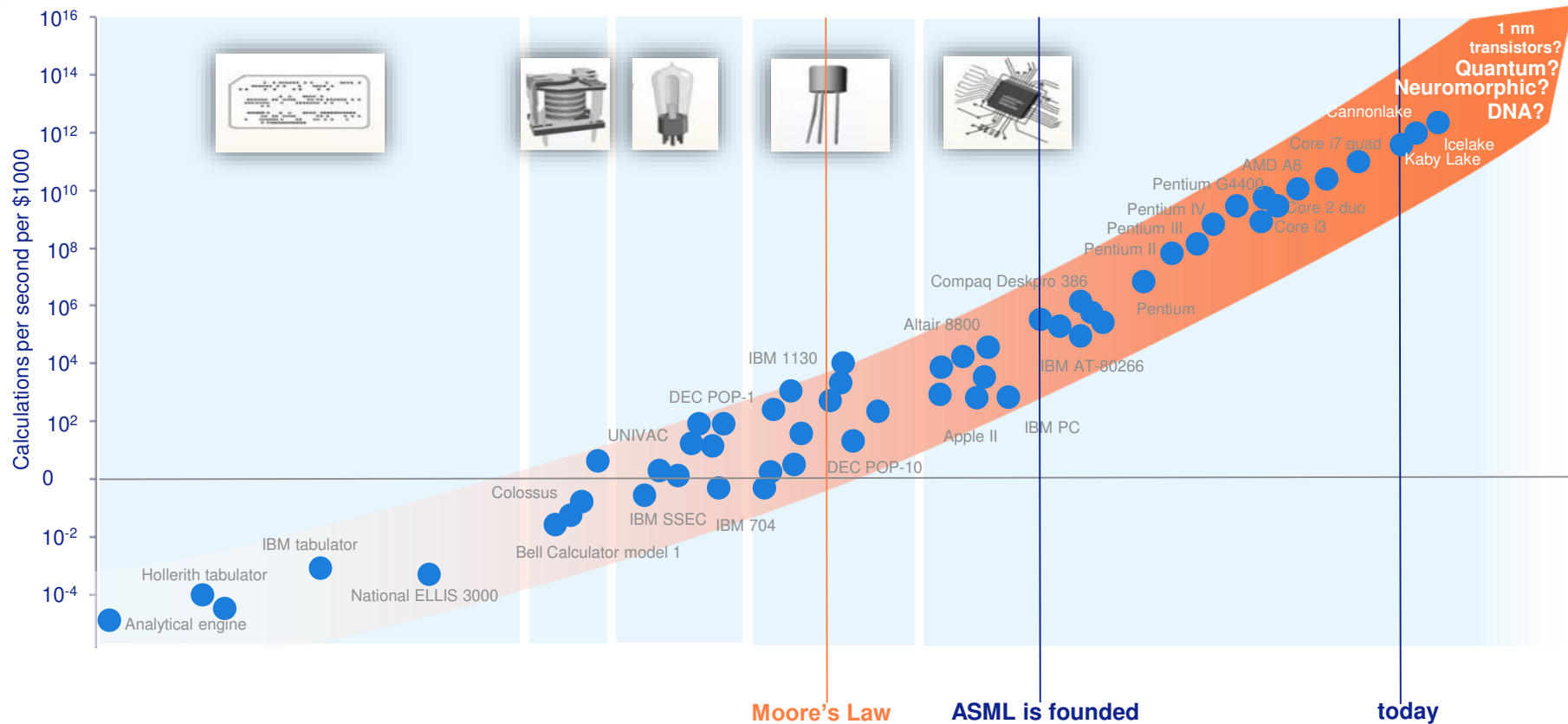
*We manage to
make this work*



ASML market is driven by the digital revolution



Moore's Law of economics drives computing power



To deliver on Moore's law, we push technical limits

introduction

- 2009
- 2011
- 2013
- 2015

	190 WpH	230 WpH	250 WpH	275 WpH	>285 WpH	Overlay [nm]
2009	NXT:1950i					7
2011		NXT:1960	NXT:1965Ci			6
2013			NXT:2000			4
2015				NXT:2050		3
				NXT:next1		<3
					NXT:next2	<2

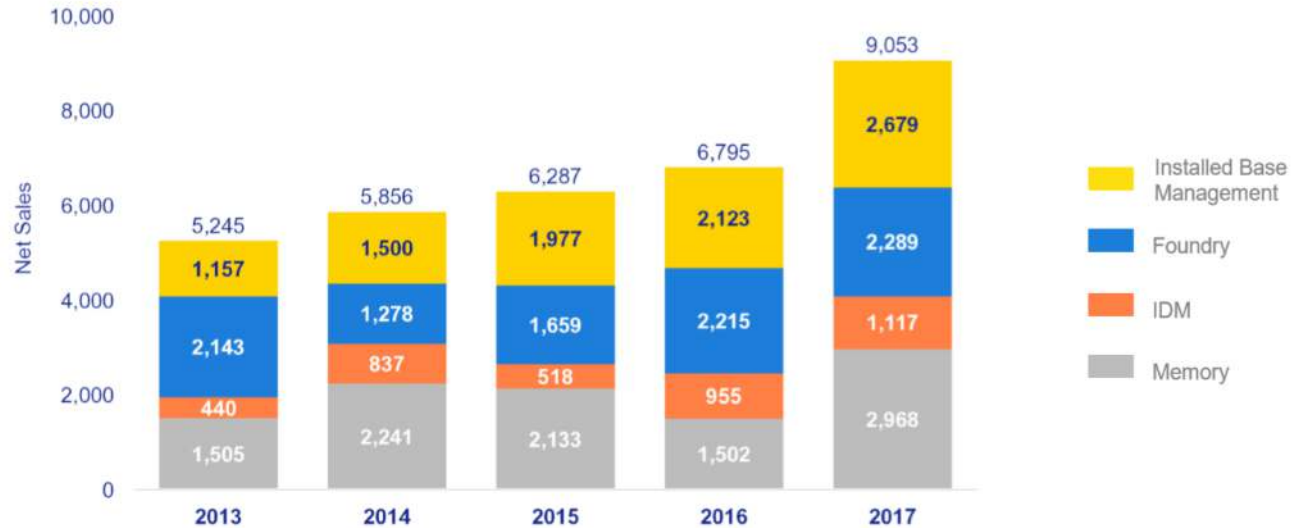
Pushing the limits of technology



products under study

Financial report 2017

Total net sales million € by End-use



Installed Base Management equals our service and field option sales

SOURCE: https://staticwww.asml.com/doclib/investor/financial_results/2018/asml_20180107_presentation.pdf

All disclaimers pertaining to forward looking statements as documented in reference apply

Sustainable relationship with suppliers

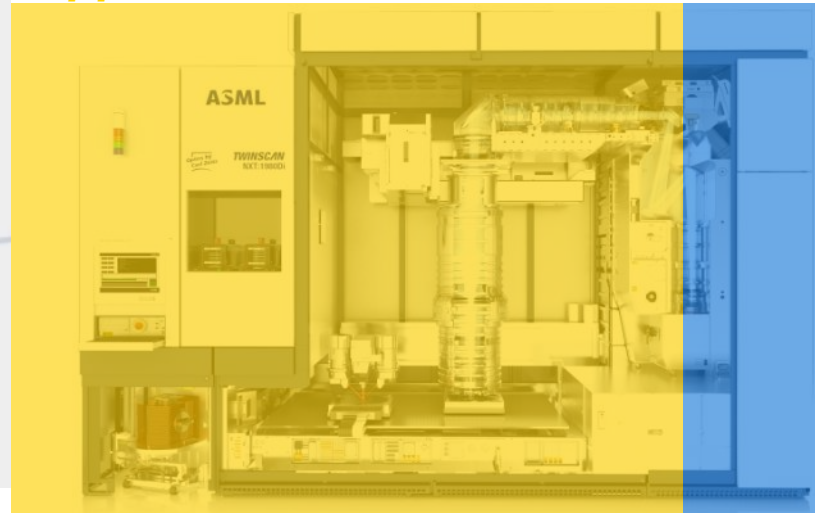


Sustainable relationship with suppliers

Key to our success is our ability to build a world-class supplier network that enables us to concentrate on our core strengths and enables our suppliers to gain fair benefits from working with us.

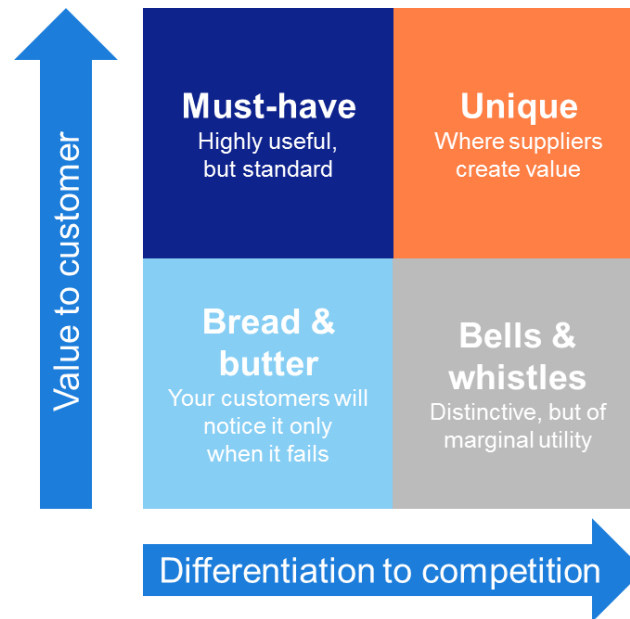
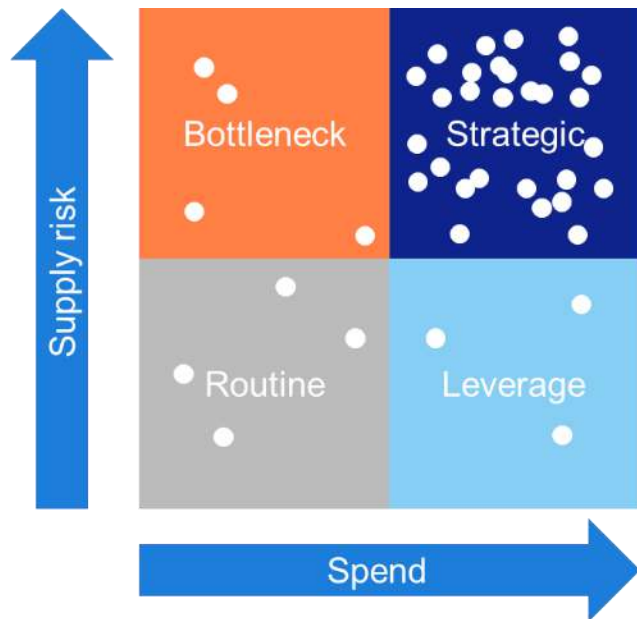
suppliers

ASML



Up to 85% of our systems is procured

Our sourcing model is not the classic Kraljic matrix



We have very close ties with our suppliers

From shared responsibility

BUSINESS & FINANCE

PREVIOUS NEXT TABLE OF CONTENTS

Trumpf invests €70M in EUV laser building

17 Jun 2015

Multi-storey site at Ditzingen headquarters to make giant lasers

Industrial laser firm Trumpf is to invest €70 million in a new building where engineers will make ultra-high-power lasers for the emerging generation of extreme ultraviolet (EUV) lithography equipment needed by semiconductor chip manufacturers.

Bits&Chips

AUTOMOTIVE MEDISCH CE SEMICON SOLAR

CHIPS DRAADLOOS ELEKTRONICA SOFTWARE

Home VDL neemt volledige design en productie waferhandier van ASML over

VDL neemt volledige design en productie waferhandier van ASML over

Aanslag: René Raaijmakers

14 mei 2014

ASML draagt de verantwoordelijkheid voor zijn waferhandier vakged over aan VDL ETO in Asst. V

To part ownership

ASML Buys Stake in Carl Zeiss Unit for \$1.1 Billion in EUV Step

By Gabriela Perini

ASML (ASML) agreed to buy about a quarter of a Carl Zeiss AG unit for 1 billion euros (\$1.1 billion) to help the company to develop a semi-conductor system for the next generation of high-performance lithography.

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55.3 BILLION USD IN R&D IN 2017

RECORDED FOR INFLEWS (2015-2017)

ASML (ASML) agreed to buy about a quarter of a Carl Zeiss AG unit for 1 billion euros (\$1.1 billion) to help the company to develop a semi-conductor system for the next generation of high-performance lithography.

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Company: August 27, 2012

Samsung joins ASML's customer co-investment program

Samsung Electronics has joined ASML's Customer Co-Investment Program for Innovation and has committed to contribute EUR 276 million to ASML's research and development of next generation lithography technologies over five years.

This completes the program, as the target for aggregate R&D funding commitments of EUR 1.38 billion has now been met. Samsung has also committed to invest EUR 205 million in a 3 percent ASML equity stake under the same general terms as the other program participants.

As our customers have a stake in ASML

To full ownership

Chip gear maker ASML buys Cymer for \$2.5 billion

ED Eindhovens Dagblad

ASML neemt Wijdeven Motion over

24 september 2012 | Laatst bijgewerkt: 25 september 2018

What drives value for our customers?

MAKE IT
WORK

Execute the roadmaps

MAKE IT
WELL

Deliver quality products and services

MAKE IT
TOGETHER

Align customers, suppliers and peers

MAKE IT
WORTH IT

Improve cost per function /
return on investments

MAKE US
GROW

Develop our people and processes

ASML risk management up to 2 years ago

QLTCS Supplier Profile

Q1	L1	T1	C1	S1	Compliance
Q2	L2	T2	C2	S2	Business Continuity
Q3	L3	T3	C3	S3	Environmental Performance
Q4	L4	T4	C4	S4	Health & Safety Performance
Q5	L5	T5	C5	S5	Labor Ethics
Q6	Yield	T6	C6	S6	Business Ethics
Q7	Suppl	T7	C7	S7	IP Protection / Information Security
			C8	S8	Supplier Management (N-tier, Sustainability)

Yearly Risk Assessment

Risk aspect
Strategic Risks
Single source
Customer portfolio
Technology Ownership
Virtual Integration level
Material availability
2nd tier management
Flexibility Requirement
IP Protection
Natural Hazards and Calamities
Natural Hazards
Equipment/utilities risk
Financial Risk

Financial Risk Assessment



Multiple others, some ad hoc
E.g., conflict minerals, varying scope

Conflict minerals due diligence: process

ASML
Software
and
Services

Process	1	2	3	4	5	6	7	8	9	10
1	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify
2	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify
3	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify
4	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify
5	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify
6	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify
7	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify
8	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify
9	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify
10	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify	Identify

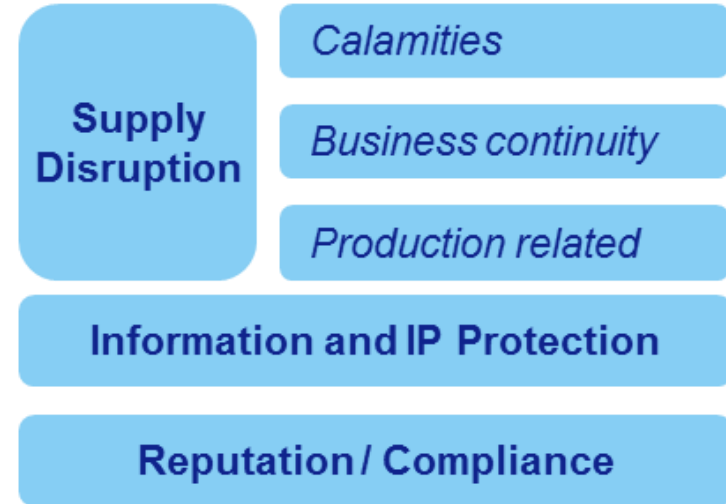
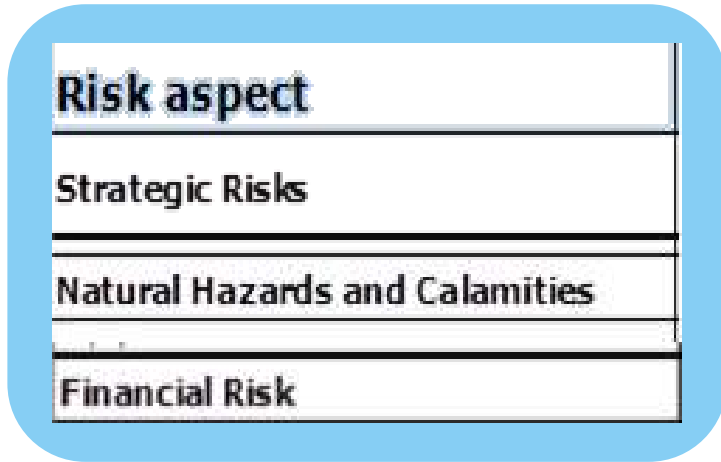
EICC-ON tool supports these process steps

Risk information of suppliers was scattered. Instruments were partially overlapping.
The risk management process was annual rather than continuous.

Risk Profiling will focus on the core risk domains

From 3 risk aspects

To 4 risk domains



... of which strategic risks harbors a mix of cost, IP and disruption risks

providing clarity on those risks deemed relevant in ASML risk universe

Process is captured in a single tool

43% of data input is automated



Financial expert ratings

Global risk indicators by Maplecroft

Supplier profile scores

Vendor master- and contract data

Sourcing Lead completes assessment

Supplier	Country	Risk	Assessment	Score	Comments
Supplier A	USA	High	Financial stability assessment	7.5	Supplier A is a high-risk supplier due to its location in a high-risk country.
Supplier B	USA	Medium	Intellectual property ownership	6.5	Supplier B has a medium risk due to its intellectual property ownership.
Supplier C	USA	Low	Legal, compliance	8.5	Supplier C has a low risk due to its legal and compliance record.
Supplier D	USA	Low	Recovery times	8.5	Supplier D has a low risk due to its recovery times.

Ownership, dependency

Intellectual property ownership

Legal, compliance

Recovery times

Category Manager reviews risks & plans

Risk Domain	Indicator
SUPPLY DISRUPTION	Ownership / management stability assessment
Risk #	01

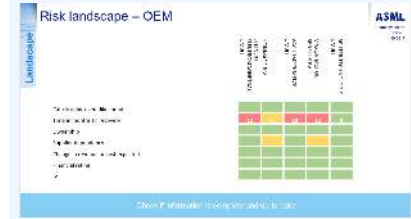
Sourcing Lead drafts plans with experts

Finance

Legal

CIP

Standard reporting incl. red flags in place



SS&P staff ensure decision making is in line with agreed governance



Process is based on a preliminary governance model

**Process map with
RACI has been drafted**

**The main supplier
risk domains are in scope**

**Rules defined to escalate risks to
the appropriate management levels**

*the governance model is confidential
and therefore not part of this hand-out*

- A process map with RACI has been drafted and is embedded into the Procurement process framework
- Risk review meetings will be scheduled

- 6 risk domains are assessed – calamities, financial stability, ownership, IP ownership, information security and compliance
- Typical mitigative responses are commercial interventions or supplier development.

- A risk appetite dialogue sets the threshold for scoping and risk level categorization
- Mitigation plan approval levels based on risk level categorization
- Red flag reports are available per risk domain

What is expected of suppliers?

Information Security requirements

Draft Information Security areas (based on ISO27001:2013)



Information Security Management System (ISMS)



Human Resources Security



Access Control



Cryptographic Controls



Physical Security



Operations Security



Logging & Monitoring



Control of Software



Network Security / Information Transfer



Network & Mobile Security



Development & Support Security



Supplier Information Security



Information Security Incident Management



Information Security / Business Continuity



Compliance



Information Security Review

ASML engineering intellectual property is critical

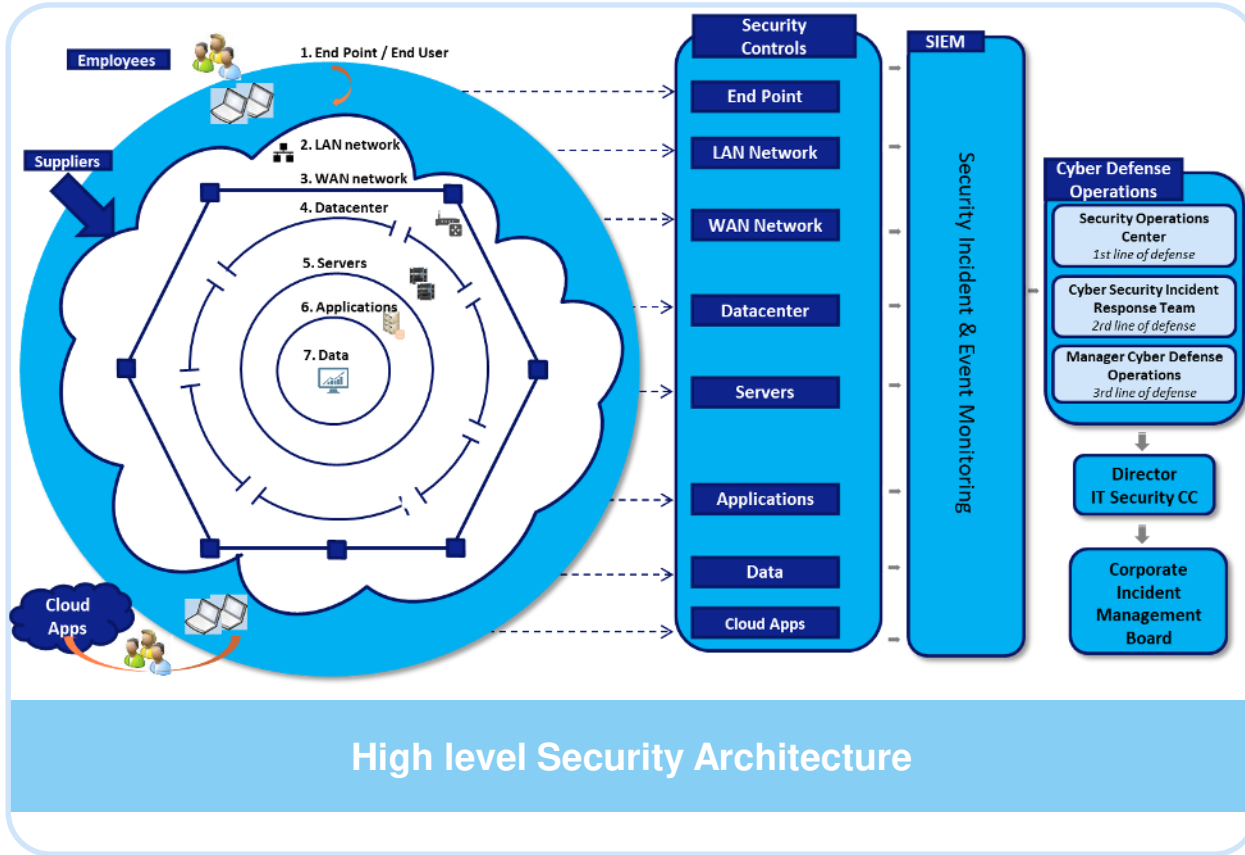


Patent wall at the experience center

Engineering Top Secrets and IP

- Information exchange is needed
- Work together with supplier on new technology
- New technology can be patented but has to follow IP process

Security Architecture



Security Architecture
Layers of defense
Security controls for each layer

ASML IT Infrastructure is network level connected with suppliers

High privileged suppliers for outsourced activities

Inclusion based on impact

ASML: engineering intellectual property is critical



Engineering Top Secrets and IP

- Information advantage in order
- Value together with supplier on new technology
- New technology can be produced if it has to follow IP process

Impact: ASML is the engineering center

(Engineering) Top Secrets

ASML: Security Architecture



Security Architecture

Layers of defense
Security controls for each layer

ASML IT infrastructure is network level interconnected with suppliers

High privileged suppliers for advanced technology

High Level Security Architecture

Network connected suppliers & high privileged

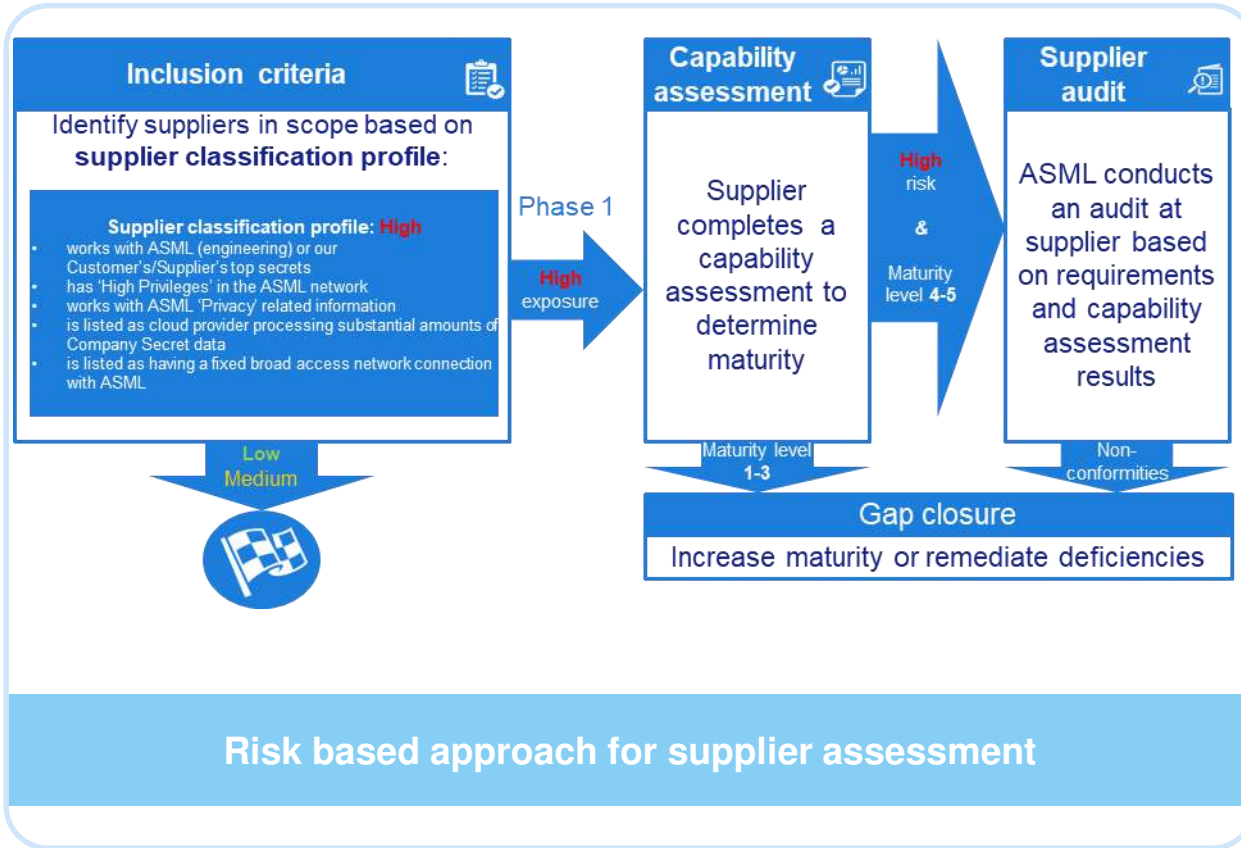
ASML: GDPR, Cloud



General Data Protection Regulation

GDPR and cloud

Supplier Risk Management



Supplier Risk Management

- Inclusion of suppliers is risk based
- Questionnaire answered by supplier
- Outcome of questionnaire validated and used for further actions
- Maturity of supplier determines how to proceed

Information Security survey



Information Security Management System (ISMS)

Is your company ISO 27001 certified?
In case your company is not ISO 27001 certified, do you have an information security management system in place according to ISO 27001 or similar standard?

ISMS activities are performed ad hoc

ISMS activities are performed based on limited guidance and best effort

Typical evidence:
Informal ISMS instructions / guidelines

ISMS activities are performed based on defined and documented practices

Typical evidence:
Defined ISMS processes and supporting materials (e.g. risk register for action tracking etc.)

ISMS activities are performed based on formal practices that are periodically reviewed and its effectiveness measured

Typical evidence:
Approved and up-to-date ISMS policy (including governance setup) Information Security dashboard (project status, Information Security insight)

ISMS activities are performed via an automated GRC solution, the organizations ISMS is certified

Typical evidence:
ISO 27001 certificate

Please indicate your type of evidence:

Submit Survey

Conduct your own online surveys

InfoSec questionnaire based on ISO27001

Information Security Survey

- Based on ISO 27001
- First Wave of suppliers selected for deployment
- Cloud application (secure!) for survey management
- SharePoint solution for monitoring outcomes & progress on improvement plans

Risk levels determines seniority of decision makers

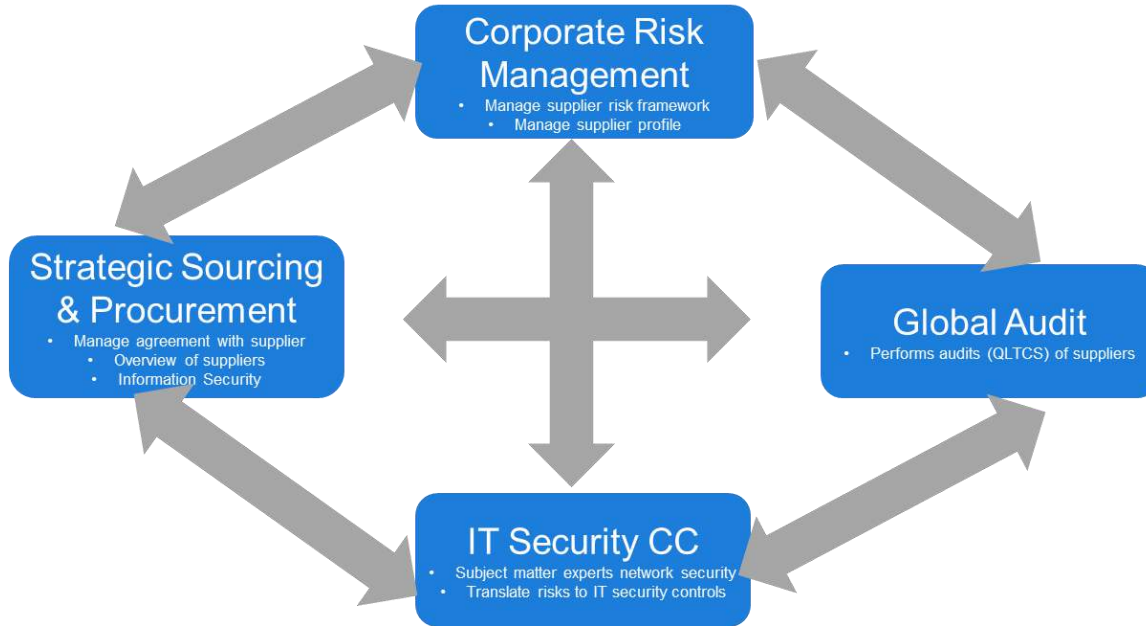
Risk domain	Very low risk (excluded)	Low risk	Medium risk	High risk (red flag)
Calamities	Commodity products with multiple suppliers in the market and short order lead times are excluded from the detailed risk profiling			
Ownership continuity				
Financial stability				
IP ownership				
Information Security		<ul style="list-style-type: none"> Access to critical knowledge, but ISO27001 compliant 	<ul style="list-style-type: none"> Minor non-conformities vs ISO27001 Supplies indirect competitors 	<ul style="list-style-type: none"> Major non-conformities vs ISO27001 Supplies direct competitors
Reputation & compliance				

Typical Highest Approval level

Category Manager

Sourcing Management

Executive Management

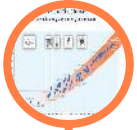


Information Security Policy, Standard and Capability Matrix Based on ISO 27001

- First Wave of suppliers selected for deployment
- Cloud application (secure!) for survey management
- SharePoint solution for monitoring outcomes & progress on improvement plans

We continue to invest in our suppliers and people

Our culture and business sector



To contribute to this world of exponential improvement



In close relation with suppliers



Act now with the future in mind



Where supplier development is not just a buzz word – it is a necessity

Welcome to our world

Selected vacancies at ASML

IT – Quality and Compliance Officer

IT- Application Security Analyst

IT - 3rd party IT Security Manager

<https://www.asml.com/careers/vacancies/en/s32420>

Some numbers

- Currently 654 vacancies world wide
- Veldhoven 427
- From high school diploma up to PhD
- From student to senior

The image features the ASML logo in a bold, dark blue font on the left side. The background is a light blue gradient with abstract, flowing white and light blue wave-like patterns that sweep across the frame from the bottom left towards the top right. The overall aesthetic is clean, modern, and professional.

ASML