



# Cryptomathic (Quantum)

Location	Aarhus, Denmark	Originators	Ali Al Alaf (Bence)
Industry Specialization	Software & Technology	Broker	Ernst & Young, Denmark
Industry	Software	Source	Investment bank
Owned by	Privately Owned	Auction Type	Full
Riverside Experience	Spirion	EMOM Date	06/04/2021
		Bid Due	21/04/2021

## Company Description

Cryptomathic (the "company") is the leading supplier of crypto-based security solutions worldwide. The company has patented crypto-based security solutions with market leading certifications and security levels. To protect their customers' data, Cryptomathic provides (i) key management solutions, (ii) e-signature & authentication, (iii) EMV and (iv) mobile app security solutions. The company is a trusted partner of more 90 blue-chip customers, mostly financial institutions, and enjoys first-mover advantage in crypto-based security software solutions. Founded in 1997, the company is headquartered in Aarhus, Denmark and currently employs 85 FTEs.

[www.cryptomathic.com](http://www.cryptomathic.com)

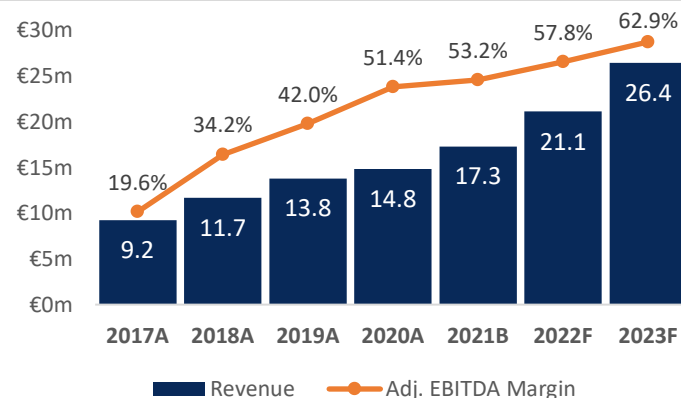
## "Sweet Spot" Characteristics:

	Yes	No	???
Little Leader? % Market Share	X		
Growth Potential? Pan-European	X		
Global	X		
Low Customer Concentrations? % #1 Customer		8.7%	
% top 5 Customers		33.1%	
Growing End Market? % Growth Rate	+20%		
Recurring Revenue? % Recurring	+80%		
Low CAPEX Business? % CAPEX/EBITDA		38%	
Owned by a Non-PEG?	X		
Favorable Auction Environment?		X	

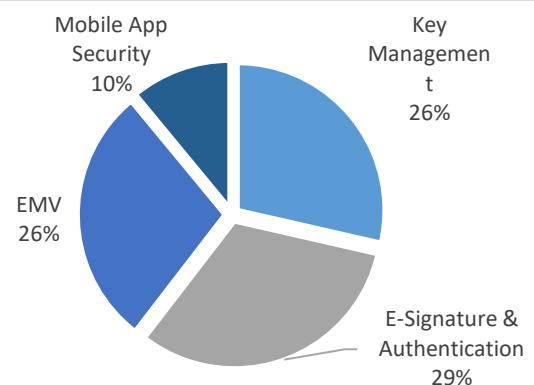
## Why Introduce?

Regarded as the gold standard in supplying crypto-based security solutions, the company is at the forefront of innovation in its space, enjoying first mover advantage in a double-digit growth industry driven by higher data complexity and volume

## Revenue Trend



## Revenue Breakdown



## Financial Data - Cryptomathic

EUR in MM, FYE 31/12	2017A	2018A	2019A	2020A	2021B	2022F	2023F
Revenue	9.2	11.7	13.8	14.8	17.3	21.1	26.4
Revenue Growth	-	27%	18%	7%	17%	22%	25%
Gross Profit	8.8	10.8	12.7	13.9	16.2	19.8	24.8
Gross Margin	96%	92%	92%	94%	94%	94%	94%
Adj. EBITDA	1.8	4.0	5.8	7.6	9.2	12.2	16.6
Adj. EBITDA Margin	20%	34%	42%	51%	53%	58%	63%
CAPEX	2.1	2.0	4.4	3.9	3.5	3.3	3.1
Capex % Adj. EBITDA	117%	50%	76%	51%	38%	27%	19%

## CAGR

'17-'20	'20-'23
17%	21%
16%	21%
62%	30%

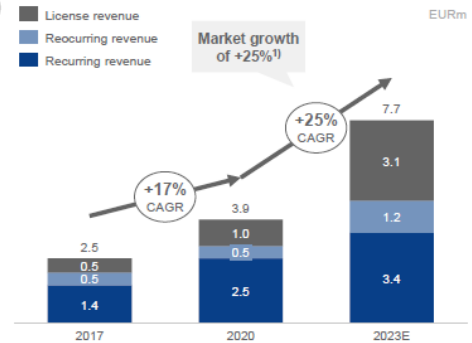
## Business Overview:

Using its unique security architecture, Cryptomathic delivers security solutions in 4 different segments of the market: (i) key management, (ii) EMV, (iii) e-signature and authentication and (iv) mobile app security. The company's solutions are recognized to be best in-class, catering to large, blue-chip customers around the world. Below an overview of the company's solutions:

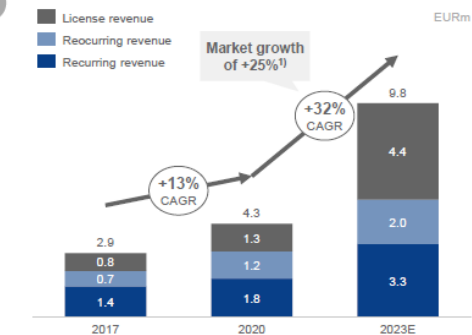
### Products

Share of total 2020 revenue

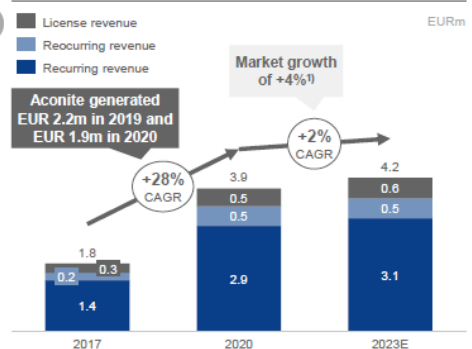
### Revenue development of segment



### Revenue development of segment



### Revenue development of segment



### Revenue development of segment

License revenue  
Recurring revenue  
Recurring revenue



In addition to its products, the company also provides services before, during and after implementation (including consulting, support or solution design).

#### Crypto Key Management System (CKMS)

16%

- When handling sensitive data, it should always be secure and accessible for the right people at the right time which is ensured by a key management system
- Managing an increasing number of cryptographic keys across business applications is becoming evermore challenging. Manual and decentralised processes are costly and error prone, and demonstrating compliance is time consuming
- CKMS solves these challenges through efficient and automated protocols, while giving administrators the flexibility to manage application keys centrally throughout their entire life-cycle
- CKMS creates instant value for customers due to its ability to automate work flows while reducing costs and risk

#### Crypto Service Gateway (CSG)

10%

- HSMs have limited power in order to drive crypto-based applications, and the optimisation of the HSMs are therefore vital. This is offered with the CSG product, allowing for significant cost saving
- CSG is a cryptographic control centre enabling businesses to deliver HSM Cryptography as a Service. CSG provides a complete overview and control of an organisation's cryptographic hardware, policy enforcement, logging and auditing as well as key management
- CSG's centralized crypto infrastructure eliminates 50+ common crypto problems, including integration, data encryption, tokenization, and many more
- CSG helps deliver huge cost and time savings for customers, e.g. Barclays reduced its number of HSMs by approximately 500

#### Signer

21%

- Cryptomathic invented remote digital signature in 2001 and is a pioneer within the field
- Cryptomathic Signer is a remote digital signature solution incorporating Cryptomathic's certified Qualified Signature Creation Device (QSCD)
- Signer allows organisations to offer a highly versatile, non-repudiable (enabled using the WYSIWYS technology) and legally binding signing service
- With the CC EAL +4 certification for eIDAS Signer has the highest possible certification and the security profile makes Cryptomathic's Signer probably the most secure solution in the world
- Signer is the system behind the most mature central signing scheme worldwide (NemID) with 4+ million users applying the solution for eBanking and eGovernment across Denmark

#### Authenticator

8%

- Digital authentication is needed to confirm than individuals are who they say they are, e.g. when logging in to a company system remotely
- Cryptomathic's Authenticator is a Multi-Factor solution designed for scalable applications such as eBanking and eGovernment
- Authenticator is a highly complementary product to Signer, since it ensures that it is the right person who is signing the document
- It is among the most secure authentication back-end solutions in the market, allowing for token independent user identification
- Cryptomathic continuously ensures to have the best authentication methods and have just been granted a worldwide patent for a new ground breaking method within authentication

#### Cardlink and EMV CA

13%

- Cardlink is an EMV data preparation system that offers best-of-breed centralised data formatting and key management while maintaining flexibility to meet any card issuing environment
- The system is used globally to issue 100+ million EMV cards annually
- Cardlink is the only major system in the market that is both HSM vendor and card platform independent ensuring that customers are not tied to one particular technology. Cardlink integrates with various issuing systems from major vendors and its format converter allows for simple integration
- Cardlink can be used for both small or large production since the solution is 100% scalable and the price is dependent on the required functionality
- Cryptomathic also has an EMV CA (Certificate Authority) in its product portfolio which is used by national or regional payment schemes to certify issuer keys in a trusted environment<sup>2)</sup>

#### Pin Manager, Payment Application Manager and EMV Transactions Manager (Aconite)

13%

- PIN Manager (APM) is primarily a solution for electronic capture and distribution of PINs through digital channels such as web and mobile banking, SMS and IVR. With PIN Manager, PIN Mailers are no longer required which is a disruption within the industry
- Payment Application Manager (PAM) is a comprehensive solution for the issuance and management of EMV payment cards as well as cards with other smart applications such as transit, eID and healthcare
- EMV Transaction Manager (ETM) adds PCI-certified<sup>3)</sup> EMV capability to an existing mag-stripe authorisation system or switch without the need for extensive modifications or an expensive upgrade

#### MASC (Mobile Application Security Core)

10%

- MASC is a proven mobile banking app security solution for Android and iOS offering the highest degree of security
- MASC enables app providers to focus on developing user-friendly business applications while leaving the critical and specialist security-related parts to MASC
- MASC is a platform independent security software development kit (SDK), delivering a framework that allows for continuous updates and rearrangement of the active protections

**Stevie Graham**  
Founder of Teller and has hacked HSBC and Barclay's app

*"The Lloyds app is watertight, clearly some brilliant security folks have worked on it!"*

Market Share	The company claims to be one of the market leading companies in the world, enjoying first mover advantage and delivering the gold standard in crypto-based security solutions.
Market Niche	High-end, crypto-based software security market
What makes it special?	<ul style="list-style-type: none"> <li>• <b>Market leading position:</b> The company claims that it is one of the leading suppliers of crypto-based security solutions worldwide, with patented solutions recognized as the gold standard in the industry. Cryptomathic enjoys first mover advantage and has been ahead of its competitors in developing solutions with the market's highest certification and security levels</li> <li>• <b>Blue-chip customer base:</b> Cryptomathic caters to a large customer base of 95 clients, mostly consisting of FIGs and technology companies. The company has some of the world's largest banks, including JP Morgan, Deutsche Bank and UBS among its clients, and enjoys low churn rates of about 9%.</li> <li>• <b>R&amp;D capabilities:</b> The company has heavy R&amp;D capabilities with 62 FTEs focusing on innovation and new product development. It is claimed that the in-house R&amp;D team of the company is one of its main differentiating factors. The R&amp;D team works in dynamic product teams combined with specialized expert groups?</li> <li>• <b>Product range:</b> The company is active within 4 different product segments based on a unique security architecture. Furthermore, the software architecture is claimed to be 100% scalable, with current delivery models based on on-premise installations or managed services. Cryptomathic claims its products are #1 in all 4 segments.</li> </ul>
Situation & Ownership	Cryptomathic is currently majority-owned by its founder Peter Landrok, co-owned by his sons Mads and Morten
Why for sale?	The company's management is looking for a new partner to help take the company through its next phase of growth, including a professionalization of the sales and marketing effort, as well as tapping into new, cloud-based products for the public market. Cryptomathic also plans to target new industries and open new offices worldwide.

## Company Overview

Year of Inception	1997
Plants & Facilities	The company has offices covering the United States and Europe with facilities in (i) Aarhus, Denmark, (ii) Cambridge/London, UK, (iii) San Jose, US and (iv) Munich, Germany.
Distribution	Cryptomathic has one sales representative in the UK, Germany and US. The sales representatives handle everything from new sales to client contact and negotiations of M&S contracts. Sales efforts have been relying on a reactive pull-in strategy with no proactive go-to-market model.
Suppliers & Materials	Technology partners/suppliers are typically HSM vendors whose products are an integral part of Cryptomathic's solutions within key management, e-signature & authentication as well as EMV. Furthermore, the company has long-standing relationships with OEMs such as Thales, Ultimaco and Entrust. The company also has solution partners, primarily consisting of 2 groups: resellers and hosting providers.
Management Team	Key management of the company consists of 7 people: (i) Mads Landrock, EVP US & Co-CEO, (ii) Morten Landrock, EVP EMEA & Co-CEO, (iii) Guillaume Forget, VP & Co-Owner, EMEA, (iv) Emil Kaae Hansen, CTO, (v) Johannes Lintzen, VP, US, (vi) Carsten Lyngsoe, (vii) Charlotte Moller Andersen, CFO. The founder of the company, Peter Landrock, is also acting as the Chairman of the company but is not part of day-to-day operations.
Employees	85 FTEs
Customers	As of 2020, the company has 95 customers, mostly from banks and other types of financial institutions. The company also serves technology companies and the eID & trust services industries.

Banking

44 contracts

J.P.Morgan

UBS

BANK OF WEST

UBP

Swedbank

Customer examples

LLOYDS BANKING GROUP

BARCLAYS

Scotiabank

Deutsche Bank

Other financial services

44 contracts

fiserv.

FirstData

cpi card group

nets

EVRY

Customer examples

ENVOY DATA CORPORATION

eID & Trust Services

15 contracts

LUXTRUST

Enabling a digital world

State of Qatar

State of Malta

State of Estonia

DEEP SECURE

State of Angola

State of Bahrain

Customer examples

Technology

3 contracts

infineon

NVIDIA

ThreatMetrix

Customer examples

Geographic Distribution

78% of the company's revenue is generated in the EMEA region, the balance of 22% coming from the Americas and Oceania.

% Recurring Revenue

The company claims 80%+ of recurring/reoccurring revenue

Competitive Landscape

Cryptomathic competes with different competitors based on the solutions it provides. Below an overview of some of the company's competitors based on the product line:





Key management competitors:

Company	Focus	Security level	Full life-cycle key management	Supports large set of key formats	BYOK for cloud	Financial services crypto formats	True crypto agility <sup>1)</sup>	Asynchronous key ceremonies
CRYPTOMATHIC	Financial services	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>
In-house development	The offline world	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>
Fortanix	General purpose crypto Key Management	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>
IBM <sup>2)</sup>	Financial services	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>
utimaco <sup>®</sup>	All industries (ATMP/OS Key Management)	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>
VENAFI	Certificate management	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>
THALES security	All industries	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>







E-Signature competitors:

Company	Industry focus	Security (certification) level	Product performance	Product flexibility	Public/private cloud readiness	Integration potential	Low cost per signature
CRYPTOMATHIC	Trust service providers and financial services	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>
BSCript	Trust service providers and financial services	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>
DocuSign	B2B and B2C in all industries	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>
Standard-based solutions such as AdobeSign	B2B and B2C in all industries	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>
OneSpan workstream	Financial services	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>
Handwritten signatures	The offline world	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>

EMV competitors:

Company	Industry focus	Security level	Product flexibility	Financial services key management	EMV Data Preparation	EMV Authorization	PIN Management	EMV CA for new schemes
 CRYPTOMATINC	Banks, FinTech Services Providers, Perso Bureaus	<div><div></div></div>	<div><div></div></div>	✓	✓	✓	✓	✓
 BARNES INTERNATIONAL	Banks, FinTech Services Providers, Perso Bureaus	<div><div></div></div>	<div><div></div></div>	✗	✓	✗	✗	✗
 Entrust Datacard	Banks, FinTech Services Providers, Perso Bureaus	<div><div></div></div>	<div><div></div></div>	(✓)	✓	✗	✗	✓
 otas group an hnf company	Banks, FinTech Services Providers, Perso Bureaus	<div><div></div></div>	<div><div></div></div>	✗	✓	✓	✓	✗

Mobile app security competitors:

Company	Industry focus	Overall security level	App storage security level	Ability to communicate trouble to back-end	Ability to thwart reverse engineering attacks	Software Development Kit
 CRYPTOMATINC	Financial services	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	✓
 OneSpan an hnf company	Mainly financial services	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	✓
 TRUSTONIC	Broad (hardware based approach)	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	✓
 pradeo	Broad	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	✓
 appealing	Broad	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	✗
 perom	Broad	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	✓

## Market Overview

<b>Umbrella Market</b>	High-end, crypto-based software security market
<b>Size</b>	Total addressable market of c. €5Bn (2020)
<b>Overall Dynamics</b>	<ul style="list-style-type: none"> <li>Increasing volumes of data requiring protection, with global data volumes expected to grow 250% through 2024, with costs and amounts of data breaches also expected to be increasing</li> <li>Growing number of cyber-attacks, with the number of malware infections increasing from 12 to 813 million from 2009 to 2018 (34% of the affected companies took at least a week to regain access to their data)</li> <li>Regulatory pressure trending upwards, companies across all countries and industries have faced more data regulation since 2000, with GDPR being the most important change since then in 2018. On the other hand, the United States has 20+ industry-specific data and security laws on the federal level and hundreds of related state laws, both expected to increase further in the future</li> <li>Most of the growth driven by financial services and technology companies, as well as industries such as healthcare and insurance demanding more secure and scalable solutions to protect data</li> </ul>
<b>Growth</b>	CAGR +20% 2020 – 2025