CS 646 Presentation: Software as a Service (SaaS)

Prithul Sarker

Learning outcome

- Brief overview of Software as a Service
- History of SaaS
- Types of SaaS
- SaaS model
- Comparison with IaaS and PaaS
- Advantages and drawbacks of SaaS

What is SaaS

- Software as a Service (SaaS) is a software delivery model in which software and its associated data are hosted centrally and accessed using a thin-client, usually a web browser over the internet.

- Simply put, SaaS is a form of cloud computing that delivers a cloud application and all its underlying IT infrastructure and platforms to users.

- COVID-19 has acted as a catalyst and many companies are shifting to remote work for the longer term and need to pivot to SaaS-based offerings.

History of SaaS

Fee-Based Applications Software Deployment

Software Bundled with Hardware
"Free Applications Software"

On-Premise Applications Licensing

Off-Premise Applications Services Subscription

1950s
First Commercially Available
Mainframe Computers
(Discrete Applications)

1970s
First Microcomputers
(Personal Computers)
(Discrete Applications)

1990s
Migrations from
Mainframe Computing
to Client-Server Architectures
(Enterprise Applications Suites)

1989
World Wide Web
Invented

1998
First "Mult-Tenant"
SaaS Application

~ 2005
SaaS Ecosystems
(e.g. salesforce.com)

1960s
First Midrange Computers
(Minicomputers)
(Discrete Applications)

1980s
First DOS-based Microcomputers
and Personal Computer Networks
(Application Suites)

1990s
"Single-Tenant"
Applications Service Providers (ASPs)
  - Managed Hosting Services
  - First SaaS

~ 2003
SaaS Application Suites
(e.g. NetSuite, Inc.)

Commercial Software Industry

Horizontal vs Vertical SaaS

Horizontal SaaS: Instead of focusing on solving the specific business problems of one particular industry, they offer a broader range of tools that serve companies across industries and borders.

- Examples: Salesforce offers CRM and workflow automation tools suitable for virtually any industry.

Vertical SaaS: Vertical SaaS refers to software solutions specifically designed for a specific industry need.

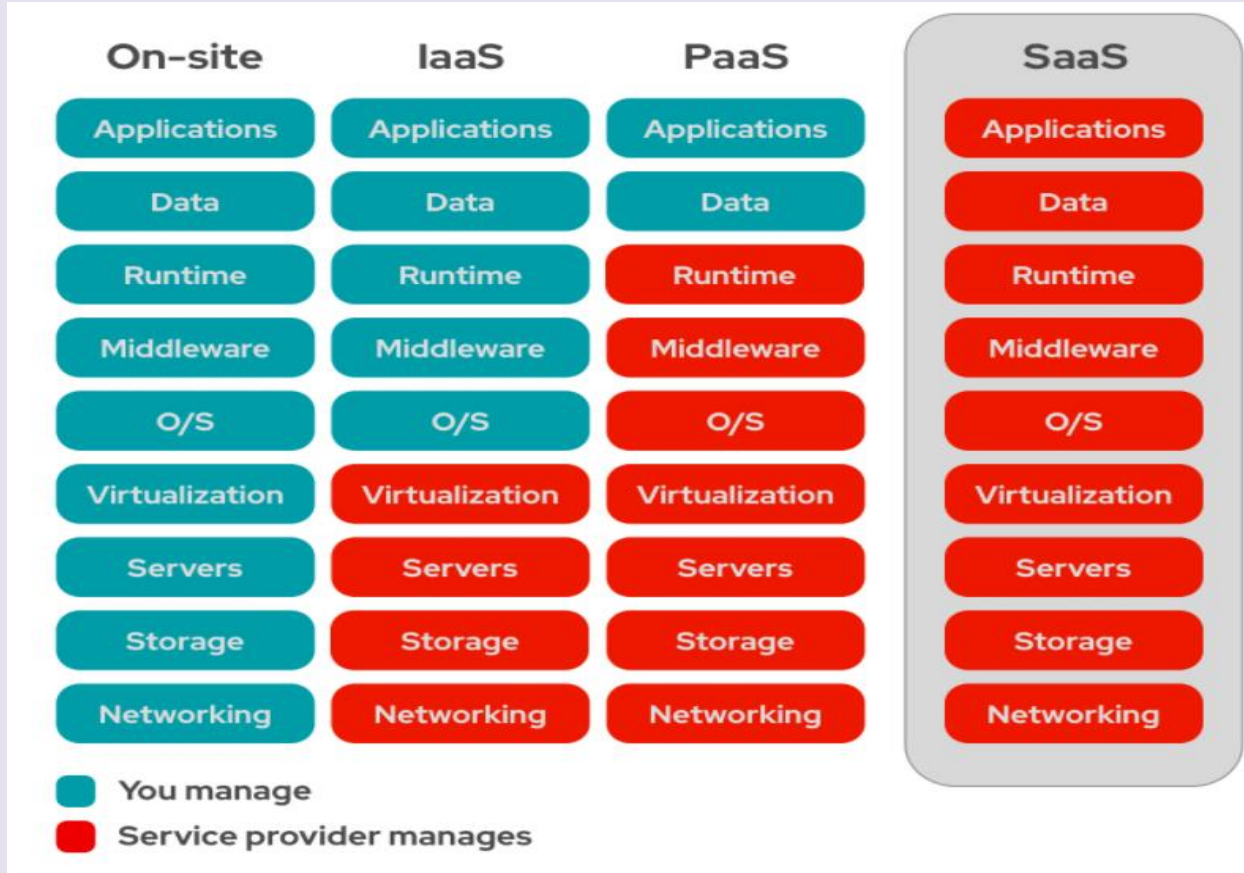- Examples: Opentable is a table booking system tailored to restaurants.

SaaS Model

- Subscription Model – Monthly or Annual
- Initial setup cost for SaaS is typically lower than the equivalent enterprise software.
- Opportunities also exist to charge per transaction, event, or other units of value, such as the number of processors required.

Comparison with other as a services

On–site	IaaS	PaaS	SaaS
Applications	Applications	Applications	Applications
Data	Data	Data	Data
Runtime	Runtime	Runtime	Runtime
Middleware	Middleware	Middleware	Middleware
O/S	O/S	O/S	O/S
Virtualization	Virtualization	Virtualization	Virtualization
Servers	Servers	Servers	Servers
Storage	Storage	Storage	Storage
Networking	Networking	Networking	Networking

You manage

Service provider manages

Comparison with other as a services

Software as a Service (SaaS)

Especially interesting for private users is cloud-based application software complete with user interface, such as Microsoft Office 365 or Dropbox, Google Drive, OneDrive & Co.

Platform as a Service (PaaS)

Companies can rent predefined platforms for software development, e.g. Microsoft Azure. The provider deals with administration of the underlying servers.

Infrastructure as a Service (IaaS)

Providers like Amazon Web Services (AWS) rent out storage and computing capacities on their servers.

Advantages of SaaS

- Easy to use
- Cheap
- Scalability
- Less prone to data loss
- Do not require users to install/uninstall binary code on their machines
- Cross Device
- Collaboration
- Agile development life cycle

Drawbacks of SaaS

Robustness:
- SaaS software may not be as robust (functionality wise) as traditional software applications due to browser limitations.

Privacy:
- Having all of a user's sensitive data sit in the cloud raises security & privacy concerns.

Security:
- Prone to attack
- Not sure what you agreed to

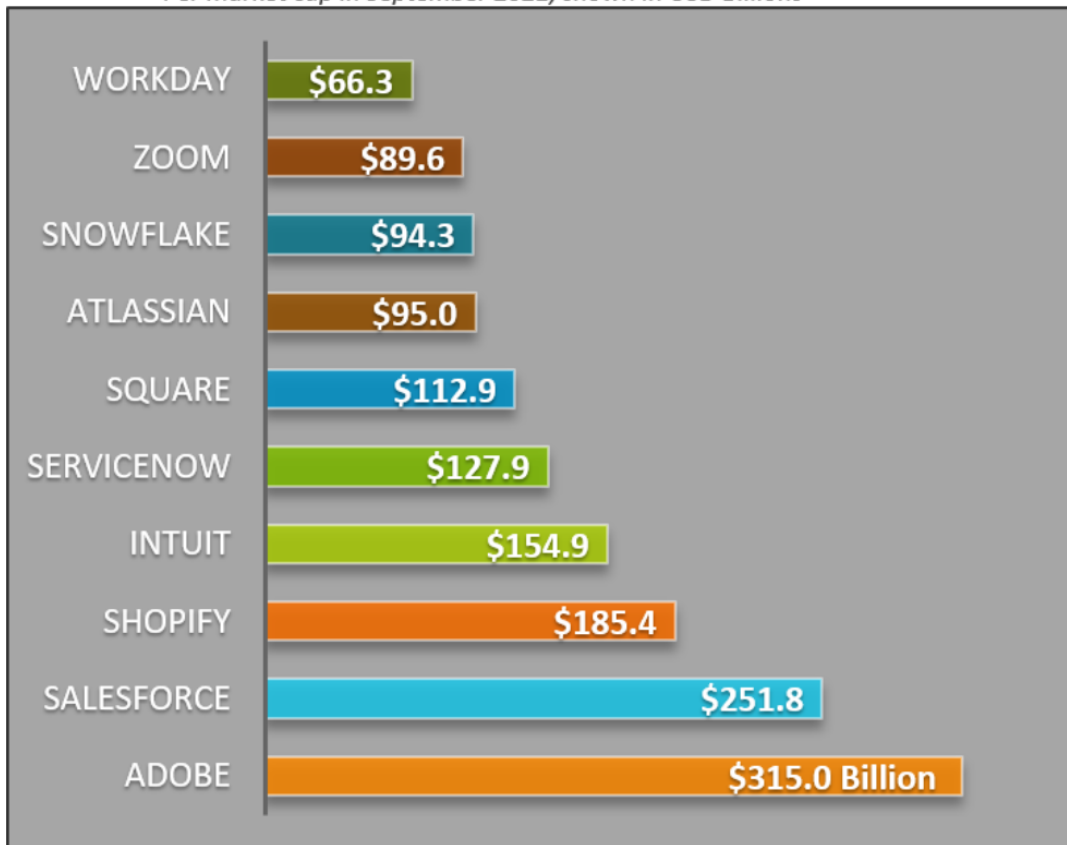Reliability:
- Difficult to recover from the server down time.

Largest SaaS Companies 2021-2022
Per market cap in September 2021; shown in USD Billions

Company	Market Cap
WORKDAY	$66.3
ZOOM	$89.6
SNOWFLAKE	$94.3
ATLASSIAN	$95.0
SQUARE	$112.9
SERVICENOW	$127.9
INTUIT	$154.9
SHOPIFY	$185.4
SALESFORCE	$251.8
ADOBE	$315.0 Billion

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Thank you