



# TechRadar

by Devoteam

A Forward-Thinking Guide  
for Navigating Tech

2022 Edition  
[devo.team/techradar](https://devo.team/techradar)



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# What's inside



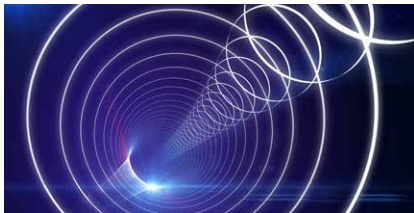
Editorial

4



Contributors

7



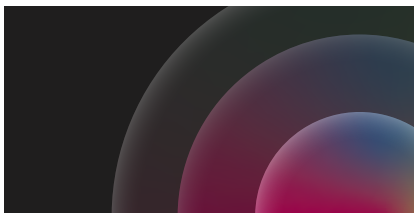
Radar at a Glance

10



Themes of this Edition

12



The Radar

16



About Devoteam

100


# Editorial

*Looking at technology through a human lens to shed light on the future*

**A**t Devoteam, we believe that the answer to the major challenges of our time can only be addressed through technology. But we also believe that we can only build a better, more prosperous, more peaceful and more sustainable world if we are guided by strong values. This vision, in which technology is indivisible from people, is our DNA, and this first edition of our TechRadar is a reflection of that.

This radar is technological because it displays 134 of the most cutting-edge and promising technologies. Some of these are already bringing about major transformations, others are still known only to a few specialists, but all have the potential to be, right now, the fundamental building blocks of a better future for companies, for their employees and for the world in general. It is crucial for organisations to have them on their radar.

*“This radar is technological because it displays 134 of the most cutting-edge and promising technologies.”*



This radar is human because it is the result of an expert, passionate and objective selection by our experts. As such, it does not claim to be exhaustive. It is not a catalogue of the solutions we deploy with our clients, nor a list of our partners, but the expression of what inspires and motivates our employees today. These are the tools with which they believe they can meet our customers' challenges, contribute to positive change and derive pleasure from their work.

*“This radar is human because it is the result of an expert, passionate and objective selection by our experts.”*

Technology is a complex and ever-changing landscape, where it is sometimes difficult to find your way around. With this forward-looking document, we want to provide essential guidance to all those who need it. We hope that this first edition will also be the start of a conversation about the world of tomorrow. A more technological and more human world.

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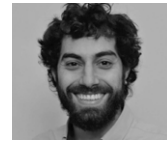
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## Thank you

Devoteam is a learning company and our talent is the spark that lights our way. The Devoteam TechRadar is a collective effort, gathered and sorted by our talented network of Devoteamers who are spread across EMEA. We want to extend a special thank you to our Tech Experts that played a key role in the realisation of this guide and hope that it will also inspire other talents to join us.

**Want to become a part of our elite team of tech leaders and have your say in the direction of the next Devoteam TechRadar?**

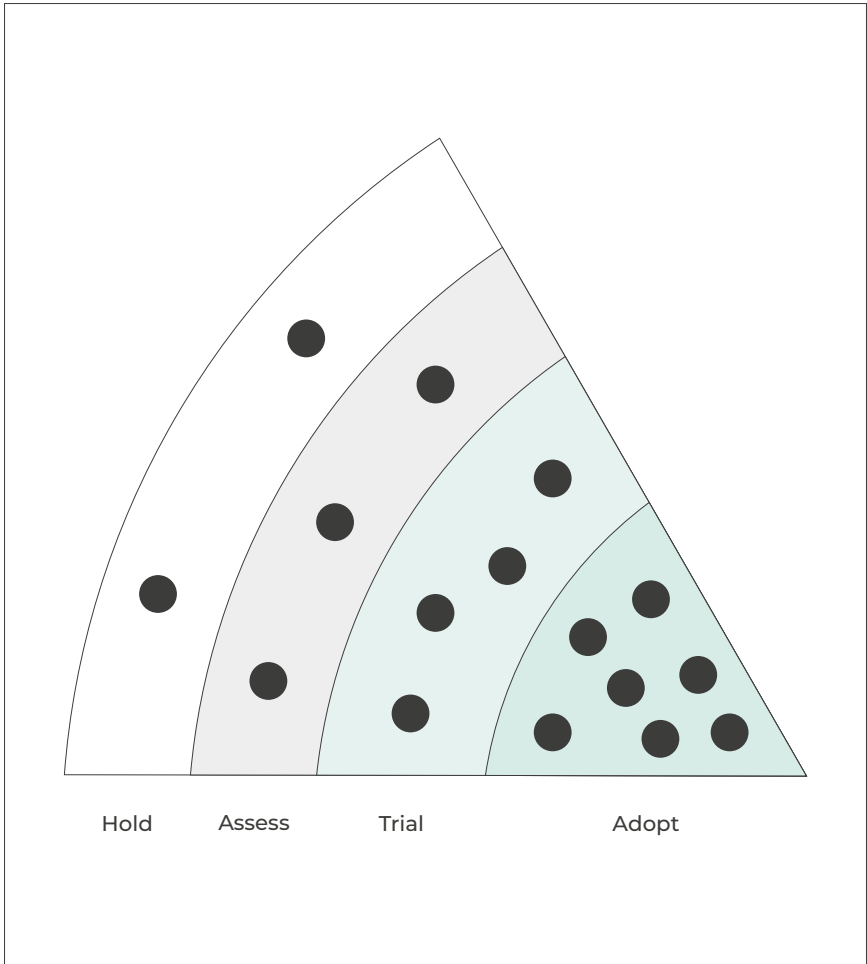
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# Radar at a Glance

Devoteam TechRadar is all about tracking interesting technologies whether they are emerging or already proven in the market. They have been carefully selected by our experts to help you navigate digital complexity and classified using 2 different elements: strategic domains and rings. The strategic domains represent topics that we consider as strategic for organisations' to become leading digital companies. The ring indicates our analysis of the technology readiness as of today - from the more "mature" ring and business-ready - Adopt - to the less one - Hold - which means the technology is a little too new to merit full investment, but should be kept in mind for future problem solving nonetheless.





**Hold**

Proceed with caution. We recommend waiting to see how the technology develops further.

**Assess**

Worth investigating to understand how it might affect your organisation.

**Trial**

Worth pursuing. You might want to try this technology on a beta project to understand how to develop this capability at scale.

**Adopt**

We strongly believe that this technology should be adopted by the industry. We use it whenever appropriate in our projects.

# Themes for this Edition

## Decentralisation

Increasingly decentralised and granular approaches to complexity

The cloud is more than a technology. It is first and foremost a way of approaching problems - decentralised, differentiated, agile, innovative - that has become a necessity for understanding the complexity of the world. This explains its unanimous and overwhelming success. Centralised approaches, hierarchical processes and “one size fits all” solutions can no longer assimilate such colossal quantities of information and provide each business, each employee and each customer with the rapid, personalised and efficient responses they expect. Increasingly combining on-premise and cloud systems under a single control plane, decentralisation is becoming the rule. Problems are being addressed in ever finer detail and solutions are being built using ever smaller building blocks, microservices, containers and functions, by increasingly autonomous teams. The technology landscape reflects this evolution, for which Gartner uses the term ‘composite’. As we can see throughout this technology radar, innovation is largely focused on these elementary blocks available and executed in the cloud; on the tools that allow them to be implemented, orchestrated, secured, scaled and the costs of this added complexity to be limited; and on the means of bringing solutions closer to the ground, by involving the business more in the development process. The challenge today is to industrialise decentralisation and decentralise industrialisation.

*“The challenge today is to industrialise decentralisation and decentralise industrialisation.”*



# Simplicity

## Ease of use, a double-edged obsession

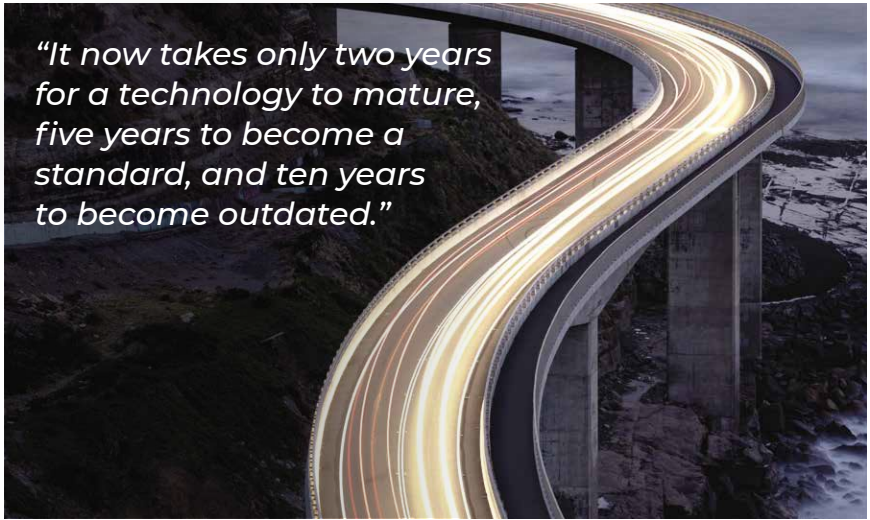
**T**o enable everyone to exploit the latest technologies and focus as much as possible on business issues (and, incidentally, to alleviate the shortage of IT skills), the vast majority of technologies listed in these pages have in common that they seek to make things easier. They create layers of abstraction to hide the underlying infrastructure, they offer connectors and standard functionalities, they automate tedious tasks, they use artificial intelligence, they offer graphical interfaces and code-free tools... Kubernetes is emblematic of this trend, and is so complex yet so essential that a whole ecosystem of solutions is being created around it to make it more accessible to developers. However, ease is not simplicity, and even less rigour. Without governance, without the strict application of common rules and without, in spite of everything, a certain technical expertise, simplicity is only a façade. The proliferation of technological artefacts created with illusory ease creates hidden complexities that will have to be unravelled one day. To quote the great Dutch mathematician and computer scientist Edsger Dijkstra, “Simplicity is a beautiful quality, but it cannot be achieved without hard work, nor can it be appreciated without education. And to make matters worse, complexity sells better.”

*“Simplicity is a beautiful quality, but it cannot be achieved without hard work, nor can it be appreciated without education. And to make matters worse, complexity sells better.”*

# Speed

## In a world of speed, technology sets the pace

**A**mong the three requirements of cost/quality/time that govern any business project, time seems to have become paramount. If the solution arrives too late, the costs will never be met anyway. As for quality, there is no longer any question of sacrificing it, as we can now do things quickly and well through agile iterations. As a result, speed is the common denominator for the technologies in this paper, whether it is accelerating IT projects themselves, decision making (through analytics and artificial intelligence), or operations (through automation). The technology world itself is caught up in this hype, and this paper is unequivocal evidence of that. It now takes only two years for a technology to mature, five years to become a standard, and ten years to become outdated. This astonishing acceleration is due in particular to the rise of open source, which is now everywhere. Subjected at birth by their creators to the appetite of developers for innovation and their critical sense, the most promising technologies spread and are perfected very quickly, accumulating users in laboratories, universities and start-ups before gradually reaching traditional companies. Better still, because of its model, open source makes it possible to go fast while reducing costs and improving quality.



*“It now takes only two years for a technology to mature, five years to become a standard, and ten years to become outdated.”*

# Sustainability

## A still emerging concern for sustainable development

**A** technology affects all aspects of life, it is natural that all aspects of life should in turn affect technology. Technology can no longer ignore the major issues of today: the environment, resilience, ethics, inequality, etc. It is no longer enough that it does not contribute to the aggravation of these issues. Tech is now expected to help address them seriously and provide solutions. When it comes to reducing greenhouse gases, large cloud based platforms are leading the way because of their scale and because their size gives them enormous leverage within clean energy use. According to IDC, switching to the cloud, and therefore to a highly energy-efficient infrastructure, often powered by renewable electricity, would make it possible to avoid the emission of one billion tonnes of CO<sub>2</sub>. Behind the leading cloud providers however, few other platforms have started to tackle this concern. Not many of these other platforms have eco-designed solutions that are intrinsically low on resources, that strive to combat accelerated hardware obsolescence, and that make their low environmental footprint an element of differentiation. However, we expect it is only a matter of time until they tackle this concern. Sustainability, which has already been taken up by the major players, will undoubtedly be one of the defining trends in technology in the months and years to come.

*“According to IDC, switching to the cloud, and therefore to a highly energy-efficient infrastructure, often powered by renewable electricity, would make it possible to avoid the emission of one billion tonnes of CO<sub>2</sub>.”*



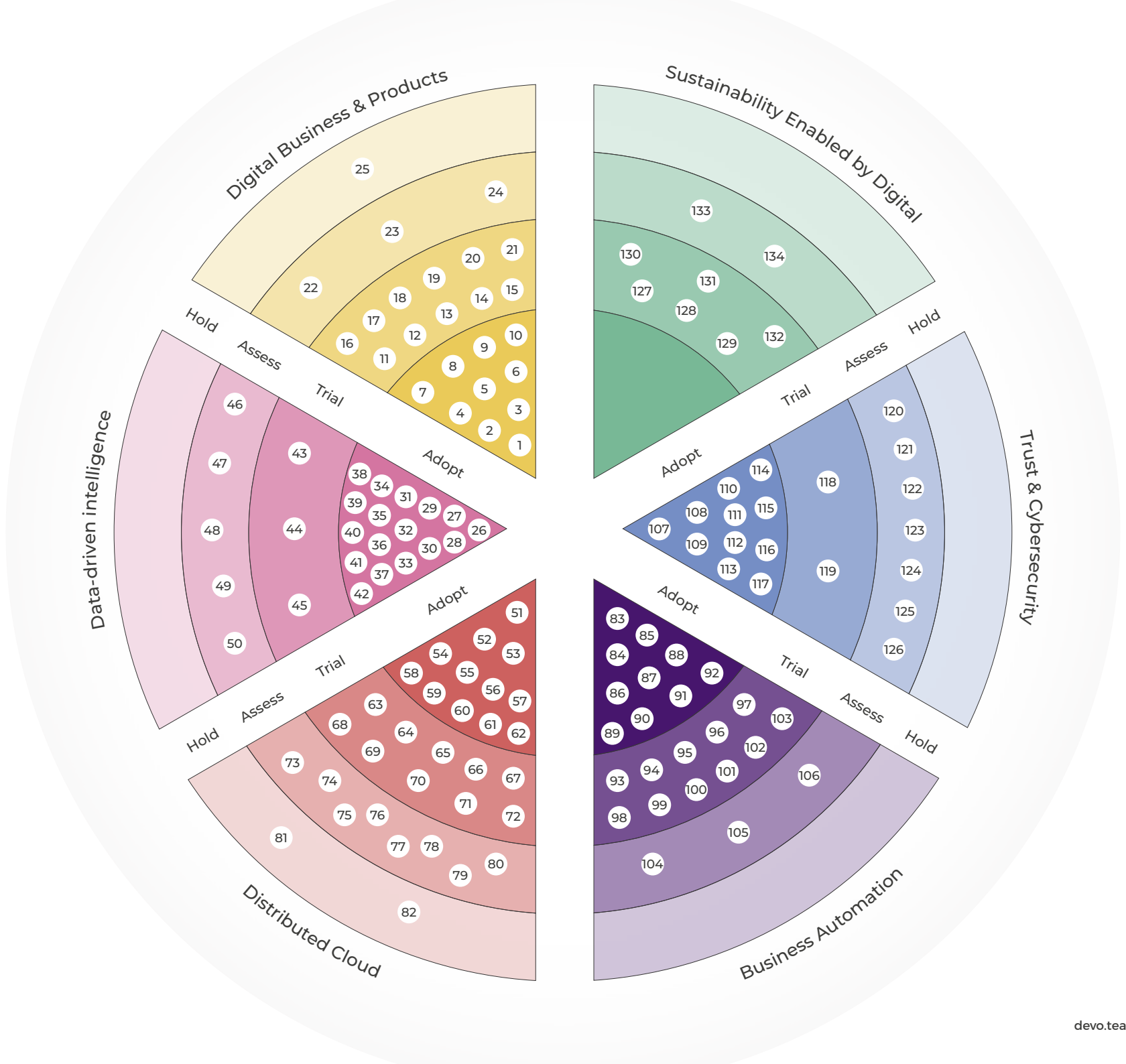
TechRadar

# The Radar

*Open to reveal* >







## **Digital Business & Products**

### **Adopt**

1. Angular
2. Apigee
3. CAST Highlight
4. Flutter
5. Kotlin
6. MongoDB
7. Mulesoft
8. OpenAPI/Swagger
9. PostgreSQL
10. React.js

### **Trial**

11. ArgoCD
12. Cypress
13. GKE Autopilot
14. Go (Golang)
15. GraphQL
16. JHipster
17. Quarkus
18. Scala
19. SOPS
20. Storybook
21. Vue.js

### **Assess**

22. Deno
23. Robotframework
24. Rust

### **Hold**

25. Azure DevOps

## **Data-driven Intelligence**

### **Adopt**

26. Alteryx
27. Apache Kafka
28. Apache Spark
29. AutoML
30. Azure Synapse Analytics
31. Databricks
32. Datamesh
33. Delta Lake
34. Google Data Cloud
35. Informatica
36. Kubeflow
37. Looker
38. Power BI
39. Qlik
40. Snowflake
41. Tableau
42. Talend

### **Trial**

43. Airbyte
44. AWS QLDB
45. Dbt

### **Assess**

46. Alation
47. Anomalo
48. Collibra
49. Dataiku
50. Fivetran

## **Distributed Cloud**

### **Adopt**

51. Ansible
52. Anthos
53. AWS Lambda Function
54. Azure Arc
55. Azure Functions
56. Google Cloud Functions
57. Hashicorp Terraform
58. Helm
59. Istio
60. Kind
61. Kubernetes
62. Portainer.io

### **Trial**

63. Cilium
64. Crossplane
65. Flexera
66. Hashicorp Consul
67. Knative
68. Kubecost
69. Mist.io
70. Pixie
71. Spinnaker
72. VMware Cloud Foundation

### **Assess**

73. AWS CDK
74. AWS Outposts
75. Dapr
76. Hashicorp Nomad
77. Hashicorp Waypoint
78. Lens
79. Pulumi
80. Sovereign Cloud

### **Hold**

81. Microsoft Azure Stack Hub / Azure Stack HCI
82. Puppet

## **Business Automation**

### **Adopt**

- 83. Automation Anywhere
- 84. AWS Step Functions
- 85. BluePrism
- 86. Celonis
- 87. Nice
- 88. Nintex
- 89. Outsystems
- 90. Power Apps
- 91. Power Automate
- 92. UiPath

### **Trial**

- 93. Aifi
- 94. Appsheet
- 95. Automation Hero
- 96. Bizagi
- 97. HyperScience
- 98. Kryon
- 99. Power Virtual Agents
- 100. Rocketchat
- 101. RPA Supervisor
- 102. Vosk
- 103. Workato

### **Assess**

- 104. Dydu
- 105. OpenRPA
- 106. RASA

## **Trust & Cybersecurity**

### **Adopt**

- 107. Aviatrix
- 108. Azure Sentinel
- 109. Checkmarx
- 110. CryptoNext
- 111. CyberArk
- 112. ForgeRock
- 113. Hashicorp Vault
- 114. Microsoft Defender
- 115. Omada
- 116. Reach5
- 117. UserCube

### **Trial**

- 118. Darktrace
- 119. Netskope

### **Assess**

- 120. CryptoSense
- 121. Deep Instinct
- 122. Devo
- 123. Lacework
- 124. Okta
- 125. Otorio
- 126. Salt

## **Sustainability Enabled by Digital**

### **Trial**

- 127. Aguaro
- 128. Energisme
- 129. Google Carbon Assessment
- 130. Microsoft Cloud for Sustainability
- 131. Salesforce Net Zero Cloud
- 132. ServiceNow ESG

### **Assess**

- 133. Eco Vadis
- 134. Zutacore

TechRadar

# Digital Business & Products

Accelerate your business by adopting the new rules of digital. Shape innovative digital businesses, performant products and remarkable experiences enabled by technology.

# Lock or Unlock the future?

Can the technologies presented here put us on the path to a better future? Or do they risk leading us down the wrong road? A look at the perspective of our experts.

## ✓ On the right path...

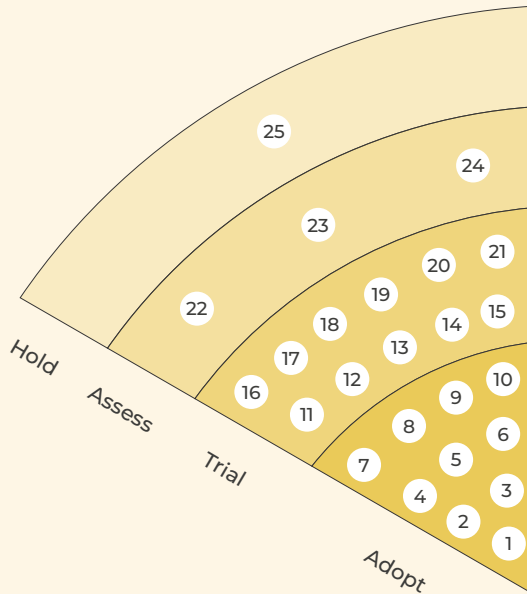
Technologies and modern development methods have now reached a level of maturity that truly gives companies the opportunity to transform themselves through and around digital. Technically, there are no more obstacles and every problem can be solved by a judicious choice of tool or infrastructure. By combining good use of technologies and new agile practices, more sustainable products are born, as well as offers that are more in line with our world and the aspirations of consumers or citizens, and virtuous models that are part of the circular economy and the economy of use.

## ✗ ... or the wrong path?

Despite all its possibilities, technology remains a tool. What it brings depends on the values of those who wield it: vision, creativity, competence, willingness to listen, humility, constancy for the best; insensitivity, arrogance, casualness, impatience for the worst. The risk of forgetting this is to fall into a form of techno-solutionist illusion: everything could only be solved thanks to technology and everything technological would essentially be progress. In order to build a better future, we must keep the necessary distance so that the end always comes before the means.



# Digital Business & Products



## Adopt

1. Angular
2. Apigee
3. CAST Highlight
4. Flutter
5. Kotlin
6. MongoDB
7. Mulesoft
8. OpenAPI/  
Swagger
9. PostgreSQL
10. React.js

## Trial

11. ArgoCD
12. Cypress
13. GKE Autopilot
14. Go (Golang)
15. GraphQL
16. JHipster
17. Quarkus
18. Scala
19. SOPS
20. Storybook
21. Vue.js

## Assess

22. Deno
23. Robotframework
24. Rust

## Hold

25. Azure DevOps

## Angular Adopt

Angular, based on TypeScript, is a free open source framework for the development of client interfaces and applications. More than just a library, Angular provides all the ingredients needed to build a web application. Based on a view-controller (MVC) pattern that separates data, graphical presentation and underlying logic, Angular envisions applications as a tree of components. This modular approach is particularly suited to the development of large applications, to which it brings rigour, clarity and performance. Widely used, Angular also benefits from the support of a strong community, but it remains a rather tricky tool to learn. The choice of a JavaScript framework will therefore depend primarily on the type of application to be created, but even more on the resources available. Contrary to React.js or Vue.js, Angular is still very opinionated, and comes with many rules and constraints to follow.

## Apigee Adopt

API-centric architecture is proving to be the foundation of new age digital businesses. For several years, Google's Apigee has been ranked by Gartner as one of the leaders in API management. To facilitate the creation, security, maintenance and use of APIs across the enterprise, Apigee offers features that span the entire API development lifecycle; turnkey policies for security, exposure and traffic management to build APIs with confidence; and all the building blocks needed to create an ecosystem: governance, developer portal, API catalogue, monetisation, etc. Apigee also enables customers to choose where to host APIs' traffic - on-premise, on GCP or on a hybrid infrastructure. Besides, with Apigee Hybrid, customers gain the full control of the runtime component while also allowing them to leverage governance and security compliance. Apigee keeps innovating with Apigee Integration, which unifies application integration and API management.



## ArgoCD Trial

ArgoCD (CD for Continuous Delivery) is a GitOps tool for Kubernetes. It allows you to view Kubernetes objects, manage the versions stored in Git (described in Helm charts, for example), compare them with the desired state and automatically restore them. With this centralised control tower of resources, developers can deploy their applications faster, and with the certainty of always using the correct and desired version. With its various possibilities (SSO, disaster recovery, scaling, etc.) and the ability to integrate with a CI/CD pipeline (Jenkins, Gitlab, etc.), this open source solution is an interesting option for industrialising the production and deployment of containerised applications.

## Azure DevOps Hold

The successor to Team Foundation Services (TFS) and Visual Studio Team System (VSTS), Azure DevOps is a suite of tools covering the entire application lifecycle: project management, requirements management, version management, testing, deployment, reporting, etc. Azure DevOps, available as a SaaS or on-premise solution, is particularly well-suited to the needs of large organisations, enabling them to rationalise and consolidate their tooling. It is compatible with

most development environments (IDEs) and can be used on all types of projects, regardless of the technologies and methodologies used. In particular, it facilitates the application of company policies and encourages collaboration between teams and between entities, making it possible to gain productivity, traceability and control over the development process.

## CAST Highlight Adopt

CAST Highlight is an application portfolio analysis tool that measures the business value of applications, identifies modernisation opportunities and potential bottlenecks, and highlights certain structural risks (open source components, licence violations, handling of sensitive data, design defects, etc.). Based on code analysis and a quick questionnaire, CAST Highlight is able to audit hundreds of applications in a few days, compared to several months for a manual process. It then provides objective and synthetic decision elements, both technological and business, which allow us to plan and then manage the rationalisation, modernisation and migration to the cloud of its applications. For organisations with a large pool of heterogeneous applications, the benefits of CAST Highlight can be considerable.



## Cypress Trial

Cypress is a testing tool for web applications based on modern front-end frameworks such as React, Angular or Vue. An all-in-one functional test engine, Cypress allows you to write scenarios in Javascript/Typescript, follow their execution step by step, debug the code and obtain a detailed report. Injected directly into the application, Cypress code reproduces the user's behaviour in the browser without having to go through the cumbersome process of an API. In addition, Cypress benefits from numerous plug-ins, which allow for example to carry out visual non-regression tests or to write tests with Cherkin and Cucumber. Lightweight, easy to use, well-documented and supported by a large community, Cypress is becoming an essential tool for front-end development.

## Deno Assess

Although Node.js is now the most popular server-side JavaScript execution environment, its designer, Ryan Dahl, considers it imperfect, especially from a security point of view. As a result, he developed an alternative, called Deno, which, like its predecessor, is based on the Google V8 engine, but this time written in Rust rather than C++. He has also embedded the latest advances in JavaScript as well as TypeScript support, and completely overhauled dependency management to avoid the use of Node Package Manager (NPM). Since the release of v 1.0 in May 2020, Deno has been growing extremely fast, having been selected by Slack for its new development platform. Based on open source, it can be deployed on various clouds, including Azure and AWS.



## Flutter Adopt

Introduced by Google in 2017, Flutter is a cross-platform open source program and development kit that allows apps to be developed for Android and iOS devices with a single code. Flutter thus eliminates the additional costs, bugs and difficulties that the coexistence of the two platforms causes to project teams. Borrowing from the best of existing approaches and compatible with common development environments, Flutter is characterised by its simplicity and performance. Very easy to learn and universally appreciated, it is supported by a still small but very active and enthusiastic community. There are already more than 150,000 applications on mobile stores developed with Flutter, which has the potential to become the language of choice for mobile developers over the next five years.

## GKE Autopilot Trial

Managing Kubernetes clusters can often be complex and time consuming without always creating value. That's why Google offers GKE Autopilot, a service that leverages Google's best engineering practises to support and automate much of the maintenance of GKE clusters. The customer loses some customization possibilities, but gains several aspects: service level guarantees, billing per pod utilisation, security by default, etc.

Serverless from the developer's point of view, GKE Autopilot can optimise the consumption of resources, but its main advantage is that it frees the teams from infrastructure issues and allows them to concentrate on the business dimension of development.

## Go (Golang) Trial

The Go language (sometimes called Golang) was created by Google in 2009 with the initial aim of facilitating the development of microservices while being accessible to less experienced developers. As a compiled language, Go requires very little memory (10 times less than an equivalent Java program), which considerably improves the performance of services. Simple, structured and concise, Go also requires very few lines of code and is relatively easy to learn, especially for developers familiar with C, from which it is inspired. Go is general-purpose, powerful and cross-platform, and has gained a lot of popularity in recent years, thanks in particular to the showcase provided by Docker and Kubernetes, which were developed with it.

## GraphQL Trial

GraphQL, which was invented by Facebook and is now open source, is an API query language

and execution environment for these requests. As an alternative to the REST architecture model, GraphQL allows clients to request only the data they want, which increases performance by avoiding unnecessary exchanges and makes it easier to scale APIs. GraphQL is particularly suitable when the data requested is organised in graphs or trees. Although it lends itself ideally to many use cases, GraphQL is still relatively uncommon because it requires an in-depth rethink of the way APIs are designed.

## **Quarkus** Trial

The frameworks of the Java world - and particularly Spring Boot, the most popular of them - were created for monolithic on-premises applications, not for distributed cloud applications. When we use them to develop microservices, the result is many "micro-monoliths" that are cumbersome, slow to start, and resource-intensive. Quarkus is a Java framework specifically dedicated to microservices and Kubernetes environments and was designed to address this issue. By eliminating the unnecessary and specialising the build for the destination platform, Quarkus enables the creation of much lighter, cloud-ready microservices. Simple and powerful, Quarkus has all the assets to compete in the future with Spring as the main Java development framework.

## **JHipster** Trial

Very often, Java applications are based on the same architectural principles and use the same basic components. JHipster capitalises on these similarities to improve both productivity and robustness of developments. As an open source low-code platform, JHipster allows the generation of complete Java source code and the rapid creation of a functional microservices-based application ready to be deployed in the cloud. To achieve a complete technology stack, JHipster ingeniously brings together a number of common frameworks and tools such as Angular and Bootstrap on the client side, and Spring Boot on the server side. JHipster saves a considerable amount of time on projects, whether they are new developments or the modernisation of legacy applications.

## **Kotlin** Adopt

Kotlin is the latest development language based on the JVM (Java Virtual Machine). It was created by JetBrains, the leader in development tools, to overcome some limitations of Java for modern development. Compatible with the entire Java ecosystem (libraries, tools, etc.), Kotlin meets the needs of both mobile development (it is the official language of the Android platform)

and back-office development, with Kotlin/Native technology allowing, if necessary, to do away with the virtual machine and have a single code for targeted platforms. Modern, concise, secure and unanimously appreciated, Kotlin is growing in popularity and seems to have the assets to last. It is used in particular by Google, Netflix and Airbnb for their mobile applications.

## **MongoDB** Adopt

MongoDB is the most popular NoSQL database management system. It is a document-oriented system (i.e. semi-

structured content organised in JSON files according to a key/value model), which allows massive and complex data to be stored while facilitating indexing and searching. Much more flexible than a relational database since documents do not have a predefined schema, MongoDB is perfectly adapted to the usual programming objects and facilitates horizontal scaling. MongoDB is available as an open source version (Community), licensed with additional management tools (Enterprise), or as-a-service on most cloud platforms (Atlas). The Enterprise version is particularly recommended when replication and sharding are required.



## **MuleSoft**

### **Adopt**

MuleSoft's Anypoint Platform is a comprehensive suite that covers all dimensions of integration (API, security, messaging, monitoring, etc.), regardless of the environment (legacy, cloud, hybrid, etc.).

Anypoint allows you to manage, via a single platform, the entire lifecycle of APIs, connectors and integration models, from both a technical and functional point of view: development, security, deployment, monitoring, maintenance, sharing, distribution, scaling, reuse, etc. Designed from the outset in the cloud and for the cloud, Anypoint is simple to implement and use, integrates naturally with IT processes such as DevOps, and provides tools for application transformation and modernisation projects. Acquired by Salesforce in 2018, MuleSoft continues its rapid expansion, particularly relying on a rich ecosystem of partners.

## **OpenAPI/Swagger**

### **Adopt**

OpenAPI is an open and independent standard for describing, developing, testing and documenting APIs (Application Programming Interfaces) that conform to the REST (Representational State Transfer) architecture style. An OpenAPI definition can be used by documentation generators to present it, API management tools to create a test environment, code

generators to create clients and servers in different languages, testing tools to generate test data or dummy servers, etc. The original OpenAPI developer, SmartBear, continues to provide tools to create, maintain and share APIs that conform to the OpenAPI specification. Now open source and supported by major players such as Google, IBM and Microsoft, OpenAPI has become one of the most widely used RESTful API description languages.

## **PostgreSQL**

### **Adopt**

Although relational databases are increasingly competing with other forms of data representation (NoSQL databases, semi-structured documents, etc.), they continue to play a major role. On the other hand, to free up the resources needed for their new projects, organisations are tending to turn away from proprietary solutions in favour of open source databases. This also allows them to free themselves from the technical, pricing and support choices imposed by the publisher. By far the most popular open source relational database, PostgreSQL appeared in 1996 and has continued to progress ever since, demonstrating its maturity and reliability through major references. Supported by an extremely active and professional community, it also benefits from a comprehensive toolkit that greatly facilitates migration projects and the move to the cloud.

## React.js

### Adopt

A free, open source JavaScript library for creating component-based user interfaces, React is used to develop websites and mobile applications. React's distinguishing features include its Virtual DOM (Document Object Model) approach, a selective rendering that only handles the differences between the document and its in-memory representation, which greatly increases performance, and its syntax extension to JavaScript, JSX, which makes it easier to manipulate components. React thus makes it possible to improve the productivity, clarity and reusability of web developments. One of the most widely used JavaScript frameworks, React owes its popularity to its ease of learning, readability and maintainability. It also benefits from the support of a very active community and the backing of its creator, Meta (Facebook).

## Robot Framework

### Assess

Robot Framework is a generic, python-implemented, keyword-driven test automation and RPA framework with an extensive ecosystem. Originating at Nokia, it is now open-source, free to use, and supported by the non-profit Robot Framework Foundation. Robot Framework has a simple syntax that uses human-readable keywords, and its capabilities can be extended through libraries.

Robot Framework can also be easily integrated with other tools (e.g. Test tools/frameworks, CI/CD tools) to create powerful and flexible test automation solutions. As a result of its origins, the Robot Framework is widely used in the telecoms world for cloud and network testing, but it is also increasingly used in the application domain, as part of agile and DevOps approaches for unit testing (Test Driven Development, TDD) and validation testing (Acceptance Test Driven Development, ATDD).

## Rust

### Assess

Rust, created by Mozilla Research, is a development language that was designed with a dual focus on security and speed. In particular, Rust imposes requirements and controls that ensure memory security. It becomes almost complicated to write vulnerable, low-quality code in Rust! On the other hand, these same properties make it easier to parallelize the code, and thus improve performance. As a sign of its merits, Rust has become, after C, the second language of the Linux kernel. Rust is still a specialist language, used for sensitive and structuring software (operating systems, web browsers, cryptocurrency...). Adopted by most of the major players, supported by a very strong community and well equipped, it has the potential to widen its use cases and be the successor of C++.

## Scala Trial

Scala is a programming language on the JVM (Java Virtual Machine) combining functional and object-oriented programming, an original approach that allows complex models to be expressed in a very clean way. It is also a much more expressive and readable language than Java, and its syntax has become even clearer with its recent version 3. A general-purpose language, Scala can be used for any type of program, but it is more particularly used in the Big Data world, as several major tools have been written with it (Apache Spark, Apache Kafka, Twitter's Scalding...). Despite its strengths, Scala is struggling to gain popularity because its learning curve is steep and its principle remains impenetrable to many developers trained only in object-oriented programming. As a result, skills are quite scarce on the market, especially outside the US. Though, after passing this barrier, the language and its tooling deliver state of the art development capabilities for modern application development that also competes and can even surpass Java.

## SOPS Trial

SOPS stands for Secrets Operations and is a tool for managing secrecy (passwords, encryption keys, tokens, etc.) in Git. SOPS allows you to edit encrypted

files of various formats (yaml, json, binary...) using a third-party key manager such as OpenPGP, Azure Key Vault, AWS KMS or GCP KMS. These files are stored centrally in Git and SOPS enables the life cycle of the files and the information they contain to be managed. Finally, the decryption of secrets is done locally, at the time of deployment. Open source (under the aegis of Mozilla), agnostic, inexpensive, easy to use and very secure, SOPS is an alternative to HashiCorp Vault, in particular.

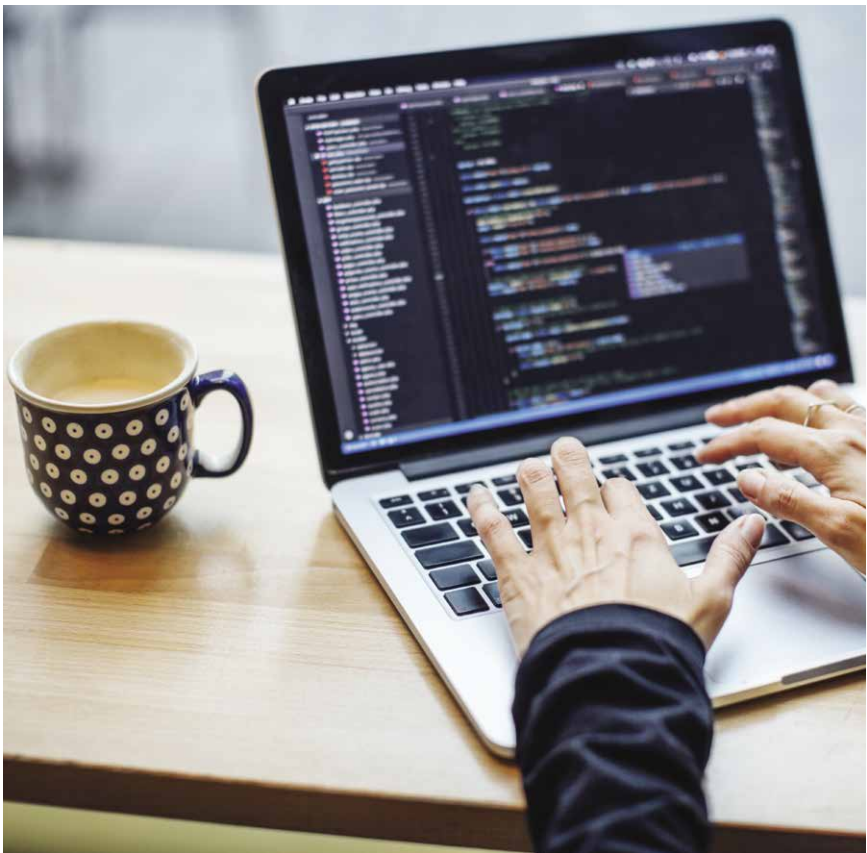
## Storybook Trial

Storybook is an open source tool that allows you to display the components visually. With large development frameworks such as React or Angular, it is sometimes difficult to isolate a single component to define, test, optimise and document it. Storybook answers this daily need of developers through a pleasant and intuitive interface. The resulting components are fully compatible with different frameworks, and most importantly, they can be saved in a repository for sharing and reuse (e.g. branded components in corporate colours). Extremely popular since its launch in 2019, Storybook has quickly established itself as a valuable lever for productivity and quality of developments and projects. However, it is already competing with another promising tool, bit.dev.

## Vue.js Trial

Vue.js was released in 2014 and is an accessible, scalable and powerful open source Javascript framework for creating modern web interfaces and applications. Vue.js stands out in particular for its component-based approach, which makes it possible to gain in interactivity and display speed, and thus improve the user experience. On the development

side, this principle is also a way to promote code reuse, reduce maintenance and increase productivity. It is lightweight, responsive, and integrates easily with existing libraries and projects. Vue.js is easy to learn and use, especially by Javascript developers with some experience. Behind React and Angular, the two main frameworks on the market (especially in terms of available skills), Vue.js is an alternative that should not be ignored.





TechRadar

# Data-driven Intelligence

Drive tangible business outcomes with data and analytics at every opportunity. Differentiate your products, services and customer experiences and surpass your competition with an insight-based approach.

# Lock or Unlock the future?

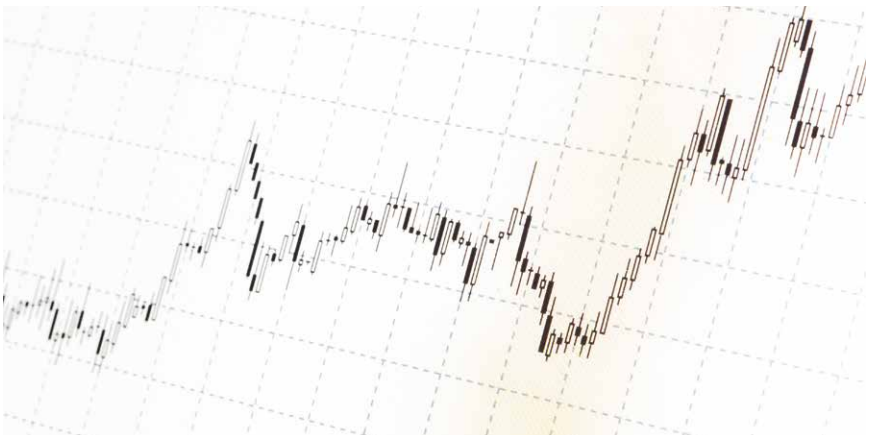
Can the technologies presented here put us on the path to a better future? Or do they risk leading us down the wrong road? A look at the perspective of our experts.

## ✓ On the right path...

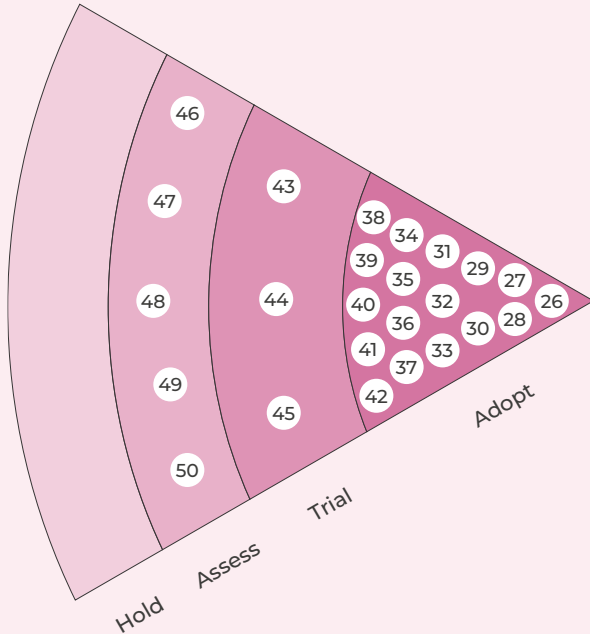
The emergence of numerous technologies that smooth out the technical complexities associated with data as well as the multiplication of tools accessible to non-specialists can give a tremendous boost to the culture and use of data in companies. This can of course help companies to make more informed choices, to become more transparent, to implement more sustainable models and to better understand and reduce their negative externalities. Data will be as important for the energy transition as it is for the digital transformation.

## ✗ ... or the wrong path?

The increased use of data and artificial intelligence also brings new ethical and societal responsibilities. The issues of security, privacy, inclusiveness, explicability and fairness of algorithms, and social impact will become central. Without strong values and institutionalised safeguards, abuses can occur very quickly. The venal exploitation of personal data, the manipulation of public opinion, systematic discrimination and mass surveillance are not science fiction topics, but current affairs.



# Data-driven Intelligence



## Adopt

26. Alteryx
27. Apache Kafka
28. Apache Spark
29. AutoML
30. Azure Synapse Analytics
31. Databricks
32. Datamesh
33. Delta Lake
34. Google Data Cloud

## Trial

35. Informatica
36. Kubeflow
37. Looker
38. Power BI
39. Qlik
40. Snowflake
41. Tableau
42. Talend

## Trial

43. Airbyte
44. AWS QLDB
45. Dbt

## Assess

46. Alation
47. Anomalo
48. Collibra
49. Dataiku
50. Fivetran

## **Airbyte** Trial

The expensive and complex maintenance of connectors, the linchpins of all data infrastructures, puts companies at the mercy of the proprietary strategies of data extraction (ETL) and ingestion (ELT) software vendors. For Airbyte, the solution is open source. The company provides a whole platform that makes it much easier to synchronise data between systems and databases, running on connectors and within Docker containers. These connectors are certified by Airbyte before being made available to users. In addition, developers are interested in the proper maintenance of the plugs, which guarantees their robustness and stimulates the community. Thanks to this model, Airbyte has been a resounding success: three rounds of funding and more than a hundred connectors created in just one and a half years of existence.

## **Alation** Assess

With its flagship product, Data Catalog, Alation aims to help companies develop the culture and use of data within their organisation. To achieve this, Data Catalog offers functionalities for data discovery, governance, understanding and sharing. In particular, Data Catalog combines artificial intelligence and human expertise to make data explicit,

assess its quality, understand its origin and meaning, and thus enable all business and IT stakeholders to access it more easily and use it with greater confidence. Alation has been named one of the leaders in data governance by Forrester and has a number of partnerships, including Snowflake, Tableau and AWS.

## **Alteryx** Adopt

As the use of data becomes more widespread in the enterprise, working manually with Excel spreadsheets or requesting IT support whenever a report needs to be created or modified are becoming decreasingly viable options. With Alteryx, business users can prepare their data autonomously, build their processes and automate them through a graphical interface requiring no lines of code. Extremely powerful and easy to use, Alteryx enables them to save considerable time and to be independent in the use of data. Founded in 1997 under the name SRC, the company became Alteryx in 2010 and has since accelerated its development, notably by forging partnerships with UiPath, Snowflake, Tableau and AWS.

## **Anomalo** Assess

Ensuring data quality is crucial, but it is a tedious and increasingly unsustainable task as volumes

increase. This is why Anomalo aims to automate it. Thanks to the indicators (freshness, completeness, homogeneity) and the reports provided by the solution, anomalies can be identified and corrected before they disrupt the whole analytical chain. The importance of the challenge and the originality of Anomalo's approach, with no competitor in this niche domain, have enabled it to attract substantial investment. However, it still has to prove itself and the absence of documentation and a trial version for the time being makes us cautious. Nevertheless, it remains a supplier to watch out for, with which to establish relationships, and whose solution should be evaluated as early as possible. If it fulfils its promises, it will be a tool that all companies will require.

## Apache Kafka Adopt

Apache Kafka is a data and event streaming platform based on a publish-and-subscribe model. Thousands of organisations use it to exchange data between applications and to build data pipelines for real-time analysis, microservice communication and critical applications such as monitoring and fraud detection. Its distributed architecture guarantees the very high performance, availability and elasticity required for such uses. Created by LinkedIn, Kafka is today a major open source project. Unique on the market for its functionalities and the extent of the possibilities it offers, it is essential for companies that handle large volumes of data. However, it remains a complex tool and its potential should be evaluated before considering its generalisation.



## Apache Spark

### Adopt

Apache Spark is an open source distributed computing framework that delivers unparalleled performance for processing very large volumes of data. Supported and used by the biggest tech players Apache Spark is compatible with most programming languages. It is indispensable for large-scale data analysis, for processing massive data streams, and for machine learning and for large-scale data operations (aggregation from countless sources, migrations). Apache Spark is also designed to provide elasticity, availability and protection against data loss. However, it requires advanced skills and heavy infrastructure (although the cloud can significantly reduce the cost). While there are alternatives better suited to certain use cases, Apache Spark is a fundamental technology for all larger organisations.

## AutoML

### Adopt

AutoML's tools aim to automate machine learning so that people without data science skills (analysts or developers, for example) can still exploit its potential. Based on artificial intelligence, they take care of some of the complex and tedious steps of the data science process (data preparation, attribute selection, model selection, result evaluation...). AutoML makes it possible to industrialise the use of Machine Learning for classic

use cases such as classification, regression, forecasting or image recognition. All the major platforms (AWS, Azure, GCP, IBM) have offerings in this field, where many highly innovative specialists such as Dataiku, DataRobot or H2O.ai also excel.

## AWS QLDB

### Trial

AWS QLDB (Quantum Ledger Database) is a cloud-based registry database that provides a transparent, unalterable, cryptographically verifiable log of mutations. As with the blockchain, each new entry adds a record to the history that cannot be erased or modified, and whose author is irrefutably identified. The difference is that the ledger relies on a centralised authority (AWS) and not on a decentralised mechanism, which can be complex and expensive to implement. For example, QLDB allows the Swedish bank Klarna to establish a complete history of financial transactions or the British vehicle registration office to keep a list of the owners of each vehicle. These references attest to the robustness of the solution and its interest for use cases requiring complete and rigorous traceability.

## Azure Synapse Analytics

### Adopt

Azure Synapse Analytics is an integrated analytical solution for Big Data in PaaS mode. Behind

a unified interface (Synapse Studio), Azure Synapse Analytics combines a data warehouse, a distributed query engine (Synapse SQL), a mass processing engine (Apache Spark) and a data loading tool (Synapse Pipeline), all with the convenience, elasticity and performance of the cloud. Naturally adapted to work with Microsoft solutions (PowerBI, for example), Azure Synapse Analytics is particularly intended for medium to large companies with advanced Business Intelligence needs (reporting, data discovery, predictive analysis, etc.) and optimised for data volumes of the order of several terabytes.

### **Collibra** Assess

Too often, data governance comes up against the priorities of everyday life. If it is not to remain a theoretical process, it must be equipped in such a way as to facilitate its implementation and make its benefits obvious: unified, clearly referenced, reliable, secure, compliant and with easily accessible data. This is the purpose of Collibra's Data Intelligence Cloud platform. It centralises all information relating to data and its governance (catalogue, rules, lineage, quality, etc.), simplifies the tasks of the various players (data owners, data stewards, data scientists, business users, etc.) and encourages their collaboration. As a partner of Devoteam, which has around 20 certified employees, the Belgian-based publisher has

established itself as a leader in this key area, which is at the heart of the repositioning of companies around data. Even to the extent that companies like Google and Snowflake are now investors.

### **Databricks** Adopt

In 2013, the creators of the high-performance analytics engine Spark founded Databricks to enable enterprises to leverage its entire power. Based in the cloud and tightly integrated with AWS, Azure and GCP, the Databricks data platform offers a high-performance, flexible and scalable solution for big data, advanced analytics, artificial intelligence and streaming. To sum up its approach, the vendor advocates the "lakehouse" approach, a combination of the robustness of a data warehouse and the flexibility of a datalake. The platform is tailored to specialised users (data engineers, data scientists, etc.) and to organisations facing complexity and/or large volumes. Currently valued at \$38 billion, Databricks continues to innovate rapidly to expand its offering and consolidate its position as a major player in data.

### **dbt** Trial

An acronym for "Data Build Tool", dbt is a solution that focuses on the T of ETL/ELT processes, i.e. the transformation phase in which data is formatted for use. Integrating

with most data warehouses on the market through standard connectors, dbt enables data analysts and data engineers to build and maintain data pipelines easily and flexibly despite the increasing complexity of the underlying business logic. To achieve this, dbt is based on the SQL language and draws on concepts from application development (CI/CD, version control, testing, code reuse, etc.). Much more flexible and easier to use than traditional ETL tools, dbt enables small data teams to respond to the explosion of requests to create or modify data flows.

## **Dataiku** Assess

Dataiku is a French company that offers an end-to-end solution for data projects, particularly artificial intelligence initiatives. Around a centralised platform, Data Analysts, Data Scientists and Data Engineers can collaborate to govern, connect and prepare data, and build analysis, visualisation and machine learning models. Dataiku's lightweight and user-friendly solution is well suited to mid-sized companies that want to accelerate the use of data, foster collaboration between the teams involved, and take advantage of artificial intelligence without having to migrate their data infrastructure to the cloud. Dataiku is positioned by Gartner as a market leader in data science and machine learning platforms, but faces strong competition.

## **Data mesh** Adopt

By breaking down the capacity limits of data warehouses, the cloud has also exacerbated the rigidities inherent in traditional, monolithic and centralised architectures. To bring more agility to data platforms, the data mesh proposes a distributed approach (comparable to microservices in the application domain). The data is gathered by domain (business, technical, geographical, etc.), whose management is entrusted to independent and autonomous teams. Each domain becomes a product (or may host several products), which its managers strive to make attractive, useful and convenient for its users. This ultimately favours the democratisation of data. However, the implementation of an overall governance and of common tools is essential for the success of this innovative approach, which could revolutionise the culture and use of data within organisations.

## **Delta Lake** Adopt

A solution created by Databricks and now open source under the Linux Foundation, Delta Lake is a structured storage layer that overlays the data lake to ensure that the data has the reliability needed for analytics and artificial intelligence. To achieve this, Delta Lake adds the ACID (atomicity, consistency, isolation, durability) transactions found



in data warehouses, large-scale metadata management, and data versioning. Compatible with the Apache Spark engine, Delta Lake can be deployed on-premises or in the cloud on most platforms. Already used by thousands of companies, Delta Lake is the new standard for Big Data storage.

## **Fivetran** Assess

In less than ten years of existence, Fivetran has established itself through its innovations in a data integration market largely dominated by established players. Fivetran is a cloud-based ELT (Extract, Load, Transform) platform that enables the creation, automation and security of data pipelines from any source to data warehouses in the cloud (BigQuery, Redshift, Synapse, Snowflake...). Fivetran's strength is its no-code approach, coupled with a very large number of standard connectors, which allows reliable data flows to be set up in a very short amount of time. This efficiency makes it an ideal solution for very large

organisations, or possibly smaller ones that want to take advantage of rapidly growing data volumes without delay.

## **Google Data Cloud** Adopt

Google Cloud brings together services and tools to build its end-to-end data platform on GCP. These include the BigQuery data warehouse, the Looker data visualisation tool, the Vertex AI platform, and a plethora of pre-trained Machine Learning models. Forming a coherent ecosystem, these various solutions integrate seamlessly with each other while respecting open source standards, allowing them to be easily combined with, or substituted for, third-party tools. On the back end, GCP guarantees a very high level of performance at all scales thanks to its considerable storage and computing capacities. Google Cloud makes it easy and cost-effective to get started with data and provides the same tools used by leading data-driven companies such as Netflix, Spotify and Twitter.



## **Informatica**

### **Adopt**

Founded in 1993 at the dawn of data warehouses and the historical leader in data integration, Informatica has reinvented itself in recent years to become a specialist in data management in the cloud. Today, the provider offers a SaaS platform based on an artificial intelligence engine that covers all the issues associated with data: integration, quality, repository (MDM), governance, anonymisation, confidentiality, etc. In a crowded data ecosystem, the functional coverage and maturity of Informatica's Intelligent Data Management solution is unparalleled. Although it is relatively high-priced, Informatica's tools are a safe choice for enterprises that need to leverage significant volumes of data despite numerous, heterogeneous, and siloed sources.

## **Kubeflow**

### **Trial**

From data collection to model development, from training to deployment and maintenance, Machine Learning (ML) projects proceed through iterations that involve data scientists, data engineers, ops engineers, and more. In order to deliver more reliable models faster, it is essential to industrialise this workflow and facilitate collaboration between these

players. The idea of the Kubeflow open source project is to leverage the Kubernetes ecosystem, which offers well-known and proven tools and execution environment. The handover from stage to stage is facilitated, and the team can easily develop, test, validate and deploy new versions of the model. Because the models and all their components are within Kubernetes containers, they are extremely portable and scalable. While still new, Kubeflow is quickly becoming a promising option in the emerging MLOps market.

## **Looker**

### **Adopt**

Looker is a BI and data analysis tool for data modelling, transformation and visualisation. It is built on its own language, LookML, which allows the creation of data models without the need for SQL. Centralised on the platform, these models can then be shared, facilitating the harmonisation of data usage and governance within the organisation. Finally, Looker does not store data permanently and relies on the power of the underlying databases, guaranteeing its performance. These particularities distinguish it from its many competitors and make it a very rich tool. Looker is suitable for all organisations, but it nevertheless requires a degree of maturity. Acquired by Google in 2019, it has become the primary reporting tool of GCP, where it is now integrated.

## Microsoft Power BI Adopt

Power BI, a Microsoft's business intelligence and data visualisation solution, allows users to create dynamic and interactive reports and dashboards from the many data sources for which it offers standard connectors. Inexpensive, since its basic functionalities are included in Microsoft 365, Power BI is also very easy to learn because it uses the familiar principles of Microsoft tools. For these two reasons, it promotes the democratisation of data use, particularly in SMEs, while offering advanced governance and security features to control usage. For several years, Gartner has positioned Power BI as the undeniable leader in data visualisation, where Tableau appears to be its only real competitor.

## Qlik Adopt

Founded in 1993, and positioned by Gartner for 11 years as a leader in the sector, Qlik is one of the pioneers of in-memory Business Intelligence. The provider, which has developed its offer technically and functionally over the years, now offers a complete SaaS data platform that includes everything from data integration and extraction to exploitation in the form of alerts, graphics and reports. Qlik is distinguished in particular by its in-memory mode of operation, which increases performance, and by very user-friendly, easy-to-use tools that promote the democratisation of data and collaboration around data throughout the organisation, regardless of its size or sector of activity. They are also inexpensive solutions, making them easy and safe to try.





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## Snowflake

### Adopt

By combining data warehouse, data lake, data engineering, data science and data sharing services, Snowflake spans the entire space between data sources and end users. Natively multi-cloud, multi-geography and disarmingly easy, the Snowflake platform breaks down both the organisational and technical barriers of traditional data infrastructures to create a one-stop shop for data and democratises its use in the enterprise. Snowflake enables organisations in particular that have an international, complex data environment, or conversely, those that lack IT and DBA resources to exploit their data easily and quickly. In all instances, the solution is very easy to test and assess its relevance and potential. Nowadays, more than 5,000 companies have been convinced and Snowflake is growing by more than 100%.

## Tableau

### Adopt

Tableau is a self-service data visualisation tool that allows anyone to create and share interactive dashboards without code or laborious operations. Tableau promotes the spread of data within organisations, making them more transparent and data-driven. Competing with Microsoft's PowerBI, Tableau stands out for its ease of use, its ease of integration

and its flexibility, all of which make it a solution within reach of all companies, regardless of their size and activity. Tableau is now looking to expand its functionality into data preparation (Prep Builder) and analytics (Ask Data, Explain Data). In 2019, Tableau was acquired by Salesforce, one of Devoteam's strategic partners.

## Talend

### Adopt

Talend, a long-time leader in data integration, has reinvented itself in the cloud era by making data quality its new workhorse. To ensure that users have healthy, compliant and usable data, the firm offers Talend Data Fabric, a platform that combines integration, governance and data quality. The cornerstone of this approach, the Trust Score, is a synthetic indicator of data reliability that Talend's tools can calculate and, above all, improve. To consolidate its position at the heart of the enterprise data ecosystem, Talend can also rely on its technological partnerships with the major cloud operators (AWS, Azure, GCP) as well as with leading analytics players (Snowflake, Databricks, Cloudera).

TechRadar

# Distributed Cloud

Harness the power of the cloud at scale to unlock a limitless future. Embrace cloud as your foundation for becoming a “digital company.”

# Lock or Unlock the future?

Can the technologies presented here put us on the path to a better future? Or do they risk leading us down the wrong road? A look at the perspective of our experts.

## ✓ On the right path...

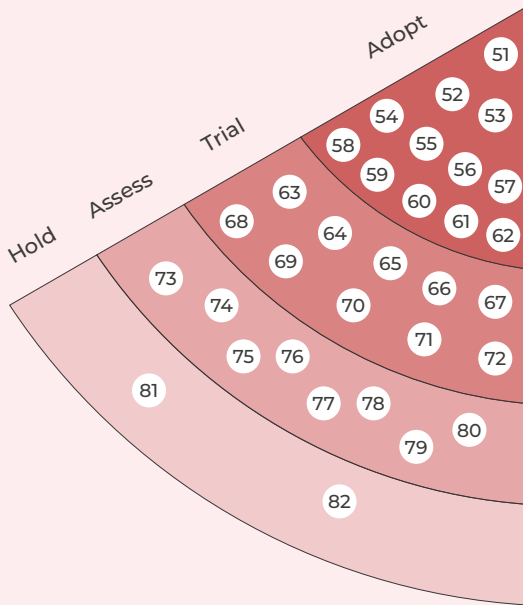
Cloud is clearly the key tool for implementing new business models, new ways of working and new lifestyles at scale. There is hardly any resistance and its innovations are so rapid that it constantly offers new answers to emerging business challenges. It is also becoming increasingly well integrated with systems which, for various reasons, are intended to remain close to the field, which increases the possibilities. Finally, it allows the environmental footprint of systems to be reduced considerably.

## ✗ ... or the wrong path?

However, Cloud leads to profound changes in IT practice, management and usage, and it is essential to support these changes. In addition, very solid governance must be put in place to guard against an uncontrolled proliferation of resources and to manage a mosaic of global suppliers and local specialists. While it may be tempting to entrust all of one's systems to a single operator, this creates operational and strategic dependency as well as security and compliance risks that cannot be offset by the convenience of having a single point of contact.



# Distributed Cloud



## Adopt

- 51. Ansible
- 52. Anthos
- 53. AWS Lambda Function
- 54. Azure Arc
- 55. Azure Functions
- 56. Google Cloud Functions
- 57. Hashicorp Terraform
- 58. Helm
- 59. Istio
- 60. Kind
- 61. Kubernetes
- 62. Portainer.io

## Trial

- 63. Cilium
- 64. Crossplane
- 65. Flexera
- 66. Hashicorp Consul
- 67. Knative
- 68. Kubecost
- 69. Mist.io
- 70. Pixie
- 71. Spinnaker
- 72. VMware Cloud Foundation

## Assess

- 73. AWS cdk
- 74. AWS Outposts
- 75. Dapr
- 76. Hashicorp Nomad
- 77. Hashicorp Waypoint
- 78. Lens
- 79. Pulumi
- 80. Sovereign Cloud

## Hold

- 81. Microsoft Azure Stack Hub / Azure Stack HCI
- 82. Puppet



## Ansible

### Adopt

Ansible, acquired by RedHat in 2015, is an open source configuration tool for Infrastructure as Code (IaC), competing with Puppet, Chef or Terraform. Ansible is distinguished by its ease of use, richness and versatility, which allow it to be used in a wide variety of contexts and use cases: automation of cloud, security, network, database administration, provisioning and deployment of applications and infrastructure, disaster recovery, etc. By promoting upstream productivity, content reuse, and limiting risks, Ansible allows users to take full advantage of automation. In addition, the capabilities are fairly widespread, which facilitates its adoption. Finally, Ansible brings the necessary guarantees of durability to complete the long journeys that automation projects often entail.

## Anthos

### Adopt

The rise of hybrid and multi-cloud environments is leading to a twofold fragmentation: on one hand, of the information system, complicating the implementation of global and homogeneous policies; on the other hand, of skills, becoming rarer and more expensive. With Anthos, Google is responding to this dual challenge by offering to unify the management of heterogeneous infrastructures around a single platform that capitalises on the technologies, skills and vast ecosystem associated with Kubernetes. Through containerisation, Anthos allows users to modernise the application park, to industrialise development and deployment practices, and to rationalise administration in heterogeneous environments. Anthos clusters are currently compatible with a large number of cloud and on-premises platforms, including AWS, Azure, VMware, etc.



## AWS CDK

### Assess

AWS Cloud Development Kit (AWS CDK) is a framework for developing infrastructure as code (IaC) in the AWS world. Starting from standard AWS components (structures), AWS CDK allows you to define infrastructure resources using a common programming language (Python, Java, etc.). The execution of these programs generates an AWS CloudFormation model, which deploys the desired resources in AWS. Unlike tools such as Pulumi or Terraform, which are designed to be multi-cloud, AWS CDK assumes that it is exclusively dedicated to a single environment, for which it is perfectly optimised.

## AWS Lambda

### Adopt

AWS Lambda is the AWS serverless execution platform. The static code is executed in response to predetermined events using resources allocated and optimised by AWS, and the developer never has to worry about it. AWS Lambda supports a wide range of languages (Java, Python, Go, C#...) and also offers turnkey functions. Pioneering the serverless concept back in 2014, AWS Lambda is a mature technology appreciated by developers who can focus on business logic. It is particularly interesting for occasional and infrequent tasks because it avoids paying for resources that would be mostly occupied with waiting.

## AWS Outposts

### Assess

For security, regulatory or performance reasons, some companies cannot, or do not want to, put all their data or applications in the cloud. AWS Outposts allows you to host a “zone” of the AWS cloud in your own data centre and benefit locally from services such as EC2, RDS, EMR, S3 or SageMaker without latency or additional connection costs. A recent and growing offering, Outposts is in the original form of a dedicated rack, which makes it very simple to implement, and provides remarkable levels of technical compatibility and continuity of user experience. However, not all AWS services are offered and its pricing model reserves this solution for certain very specific use cases, such as the processing of sensitive or very large data.

## Azure Arc

### Adopt

Whether it's to spread operational risk, avoid reliance on a single supplier, or take advantage of the strengths of each platform, almost all organisations have now adopted multi-cloud strategies. Recognising this and the complexities it creates, leading cloud providers are offering customers single control plans that provide global visibility, streamline management practices and consolidate skills.

With Azure Arc, Microsoft's multi-cloud environment management solution, companies can control and optimise their entire infrastructure, manage and allocate the various resources (VMs, containers, etc.) in the best possible way, and apply uniform policies everywhere, particularly in terms of governance, compliance and security.

### **Azure Functions** Adopt

Azure Functions enables the development of serverless functions for applications that are intended to run in the Azure environment. The promise of

serverless is that developers will not have to worry about technical issues and that resources will only be required - and therefore charged - when needed. This approach allows, for example, the rapid production of additional functionality for websites or mobile applications, but it does not offer all the guarantees needed for large-scale enterprise applications. Furthermore, while strict pay-per-use appears to be the most cost-effective approach, it is important to ensure that it remains so when scaling up. Combined with Azure DevOps (to manage versioning, deployment, etc.), Azure Functions is a very powerful tool, but it should be used with discretion.



## Azure Stack Hub/ Azure Stack HCI

### Hold

For reasons of sovereignty, compliance or performance, using the cloud is not always possible or optimal, and local infrastructure is still required. Examples include branches subject to national regulations, production sites where IoT requires minimal latency, or environments with uncertain connections such as ships. In order to benefit from the power of the cloud in these situations, Microsoft offers a new generation of hyper converged infrastructures. Azure Stack HCI allows you to deploy your applications and part of your services locally while connecting them to additional cloud services (IA, ML, PCA/PRA, backup, etc.). Azure Stack Hub is a set of hardware and software that allows you to recreate the equivalent of an Azure region in your data centre, and thus benefit from the main Azure services and portability of Azure applications locally.

## Cilium

### Trial

Thanks to the Extended Berkeley Packet Filter (eBPF) technology, which allows it to intervene inside the Linux kernel in a secure way, the Cilium open source tool brings new possibilities around the connectivity of Kubernetes clusters. Cilium goes beyond the usual monitoring tools by

allowing close observability of the functioning of clusters and their connections. It also allows network policies to be set at a very fine level of aggregation to improve performance and security, load balancing, on-the-fly encryption, service mesh, etc. Already adopted by Google and AWS, Cilium has been selected by the Cloud Native Computer Foundation (CNCF), where the project is being incubated. Cilium is an extremely promising technology, but it still needs to prove itself in an operational context.

## Crossplane

### Trial

Crossplane offers the ability to control all Kubernetes clusters from a single interface, regardless of their operating platform, thus unifying the way Kubernetes components are managed and assembled. Furthermore, in an Infrastructure such as Code logic, Crossplane allows the creation of meta-objects to build, deploy or group sets of clusters. This greatly simplifies the work of infrastructure managers and, above all, allows them to provide developers with higher-level objects, accessible in self-service via APIs, through which they can exploit the full power of Kubernetes without being specialists. Crossplane is currently being incubated by the Cloud Native Computing Foundation (CNCF) and is extremely promising, but it has yet to prove itself at scale.

## Dapr Assess

For distributed applications to become widespread, developers must be able to continue to use their preferred language and concentrate on functionality without worrying about technical issues. Dapr (Distributed Apps Runtime) meets this dual challenge by dissociating the business logic from the technical aspects, which are grouped together in a “sidecar”. Linked to the application itself via APIs, the sidecar is a portable execution environment where exchanges between containers (service calls, events, etc.), observability, state management, secret management, etc. are managed. This promising approach was initiated at Microsoft and is being incubated at the Cloud Native Computing Foundation (CNCF).

## Flexera Trial

Thanks to the acquisition of Rightscale in 2018, Flexera now offers to manage all of its IT assets, licences (on premise and cloud) and cloud services (catalogues, contracts, consumption, etc.) via a single SaaS solution called Flexera One. This makes it possible to optimise financial management globally, to consolidate and rationalise the consumption of services by the various entities, to establish precise re-invoicing, and to monitor contractual developments and budgetary commitments in a predictive manner. However, the relevance of the dashboards and suggestions for optimisation depends on the quality of the definition and organisation of the information gathered from the cloud providers.



## Google Cloud Functions

### Adopt

GCP Cloud Functions is Google's serverless execution environment. There are two ways to trigger the execution of a function: either by calling it via a standard http request or by making it conditional on the occurrence of an event. It then runs in an environment specific to the chosen programming language (to date, Node.js, Python, Go, Java, .NET, Ruby and PHP) and only the computing resources actually used are invoiced. GCP manages the infrastructure, scales it according to the load, and provides network, security and monitoring functions. The new version of Cloud Functions (dubbed 2nd Gen), which was introduced in early 2022, provides for more than 90 potential triggering events and reinforces the available infrastructure (CPU, RAM, maximum duration, number of concurrent executions) for each function.

## HashiCorp Consul

### Trial

In distributed, hybrid, multi-cloud environments, exchanges between services can quickly become inextricable. Open source and agnostic, HashiCorp Consul allows us to connect, configure and secure services running on heterogeneous and dynamic infrastructures including, for example, virtual machines (VMs), containers, and/or different orchestrators (Kubernetes, Docker

Swarm...). In particular, HashiCorp Consul enables service discovery by maintaining a centralised and dynamic registry where the list of services, their location and their health status are noted in real time. HashiCorp Consul also allows for the control of access to services and ensures that exchanges between services are authorised and properly encrypted. Finally, HashiCorp Consul allows you to automate certain network tasks such as load balancing.

## HashiCorp Nomad

### Assess

HashiCorp Nomad is a scheduling and orchestration tool for all types of workloads: Docker containers, microservices, legacy and batch applications, etc. Lightweight, flexible and agnostic, HashiCorp Nomad allows companies to easily deploy and manage all of their applications on a single infrastructure and via a single process. In particular, HashiCorp Nomad allows existing applications to benefit from orchestration without the need for rewriting, and to move towards containerisation without having to invest heavily in Kubernetes.

## HashiCorp Terraform

### Adopt

HashiCorp Terraform is an open source Infrastructure as Code (IaC) development tool. Based on its own language (HashiCorp Configuration Language, HCL), it

allows the creation, modification and versioning of an infrastructure, with the user describing the final state of the desired infrastructure and Terraform generating and executing the plan to achieve it. To do this, Terraform relies on two key concepts: providers, which establish gateways to the resources to be used, and modules, which are reusable infrastructure components. The repository of providers and modules developed and made available by the community currently includes more than 1,800 providers and over 8,400 modules. In particular, HashiCorp Terraform allows for the flexible, secure and standardised implementation and evolution of hybrid and multi-cloud infrastructures.

### **HashiCorp Waypoint** Assess

Deploying applications in the cloud for developers is often a source of complexity and frustration. HashiCorp Waypoint is a tool that allows them to specify in a very simple and abstract way their deployment needs for any application on any platform (Kubernetes, EC2, Azure container instances, Google Cloud run, HashiCorp Nomad...). Waypoint allows - with a single command and from a single configuration file - to build, deploy and release the application on the chosen environment. A relative newcomer to the HashiCorp suite of solutions, Waypoint could be particularly useful for small

development teams that do not have infrastructure expertise and do not need the procedures of large organisations or for larger organisations that wish to normalise their workflows across multiple deployment targets.

### **Helm** Adopt

Manually defining, deploying and managing applications on Kubernetes can quickly become very complex and time consuming, hence the interest in using a package manager such as Helm. Based on pre-configured templates, configurable and gathered in a single descriptive folder (Chart), Helm allows one to easily create and manage all the resources attached to the Kubernetes cluster and necessary for its operation (pods, services...). The principle of Charts greatly facilitates the updating, sharing and versioning of clusters, and thus the management of the application lifecycle. Open source, Helm is supported by the Cloud Native Computer Foundation (CNCF), which classified it as a graduated project in 2020.

### **Istio** Adopt

By bringing flexibility and lightness to applications, containers make it possible to take better advantage of the cloud, but still remain complex technical tools. As an infrastructure layer directly

implemented in the application, a service mesh makes it possible to control data exchanges between microservices and to configure and manage the various technical services (discovery, performance, access, etc.) via APIs. This simplifies container environments and, above all, the technical aspects can be managed at the application level without strong skills, or even automatically, from templates defined by the architects. Open source and integrated with OpenShift, Istio is the oldest and most mature service mesh, and big players such as Netflix, Spotify and Twitter attest to its robustness. For companies that have made microservices widespread, it is already a must-have.

## Kind Adopt

Kind is an open source tool that allows you to create Kubernetes clusters on local Docker nodes very quickly and easily. As an alternative to Docker Compose, Kind is used in Go, the language in which it was developed. Clusters are destroyed immediately after use and do not require any management or cost as they do not consume any resources in the cloud. Kind is an extremely convenient and useful productivity solution for developers when making POCs, prototyping, or testing new tools or features, to name a few examples.





## **Knative** Trial

Serverless architectures have a dual benefit: to let the development teams focus on the business issues and to reduce the future execution resources (and their cost) to the bare essentials. But setting up a Serverless function in a container is a tricky task... unless a layer of abstraction masks this complexity! This is the principle behind Knative, a framework designed to deploy, run and manage Serverless applications on Kubernetes. Knative's components notably manage the rapid deployment and automatic scaling of containers according to the needs, and the events that trigger them. Created by Google but open source, Knative is up against proprietary competitors (AWS Lambda, Azure Functions, etc.) in this segment, which is still in its early stages but is set to become an important DevOps component.

## **Kubecost** Trial

Even if cost reduction is not necessarily the primary objective of cloud-native architectures, it certainly remains an essential parameter to monitor. Founded in 2019 by former Google engineers, Kubecost provides real-time visibility on the costs specific to the operation of Kubernetes clusters (memory, CPU, etc.) and the external resources they

call upon (databases, cloud services, etc.). These costs can be managed at the level of each cluster or consolidated by application, project, team or department in order to facilitate rebilling and management. Finally, Kubecost offers alerts and optimisation paths to prevent the multiplication of clusters from resulting in an explosion of budgets.

## **Kubernetes** Adopt

In an extremely competitive technological landscape, some solutions are nevertheless establishing themselves as absolute standards. One such example is the Kubernetes container orchestration platform (abbreviated to K8s), which enables a multitude of containers to be deployed, maintained and scaled in an automated manner, independently of cloud providers. Originally developed by Google and now open source, Kubernetes has established itself as the irreplaceable backbone of cloud-native architectures, earning it the nickname "OS of the cloud". Adopted and supported by all the big tech players, surrounded by an increasingly rich ecosystem of complementary solutions (security, management, etc.), Kubernetes still remains a complex tool, requiring a certain technical maturity. Devoteam currently has more than 200 certified employees to support its customers.

## Lens Trial

Lens offers a visual environment that allows users to manage all their Kubernetes clusters (AWS EKS, Azure AKS, Google GKE, OpenShift, etc.) in a user-friendly and centralised manner. One can deploy and manage one's clusters directly from the console, while dashboards allow users to monitor their status (capacity, load, performance, etc.) and that of the various resources (pods, deployments, namespaces, network, etc.). In particular, this allows problems to be spotted quickly and the origin of the problem to be understood. An open source tool launched in 2020, Lens is already a huge hit with developers and SysOps engineers, as it greatly simplifies the management of Kubernetes landscapes, the complexity of which can sometimes hinder adoption.

## Mist.io Trial

With increasingly heterogeneous and fragmented infrastructures in multiple clouds or sites, it is becoming more and more complex to have overall visibility, to apply harmonised governance rules, to standardise processes and to finely control costs. The Mist.io platform allows you to manage all resources from a single interface: public and private clouds, containers, virtual

machines, bare metal, etc. The console offers a complete and detailed view of the infrastructure and its components, and allows you to industrialise management and usage reports. It allows you to create and manage a centralised repository of automation recipes, and to segment assets and actions according to user and team roles. Open source and agnostic, Mist.io also allows itself to remain independent of its suppliers, particularly cloud providers.

## Pixie Trial

Pixie is an open source Kubernetes cluster observability tool that uses Extended Berkeley Packet Filter (eBPF) technology, which opens up the Linux kernel, to automatically collect highly detailed operational data in real time. This information provides insight into the state of the cluster, the behaviour of the resources and the performance of the code, which in turn enables debugging and optimisation of the code. Pixie was initiated by the monitoring platform New Relic and submitted to the Cloud Native Computer Foundation (CNCF), where the project is in its early stages (sandbox). Like Cilium, which also uses eBPF, Pixie offers very promising possibilities, but still lacks references.

## **Portainer.io**

### **Adopt**

To manage rapidly expanding container environments, it is increasingly less viable to intervene directly on the clusters. Direct interaction with the clusters or containers is both complex, risky and time-consuming.

Portainer.io is a centralised management platform for multi-cluster environments that allows developers to deploy, manage and maintain containerised applications easily and without having to become experts. Compatible with Kubernetes, Docker Swarm and Azure ACI, Portainer.io is based on recognised best management practises while allowing the possibility to create its own recipes and automate its processes. Supported by a large and very active community, Portainer.io has proven to be a reliable and valuable tool for all organisations moving towards large-scale multi-cloud and containerised environments.

## **Pulumi**

### **Assess**

Defining itself as a cloud engineering platform, Pulumi offers to use the usual software development practices and tools to create, deploy and manage cloud infrastructures according to the “infrastructure as code” principles. Unlike Terraform, for example, which has its own language, Pulumi accepts Node.js, Python, Go and .NET for infrastructure coding. In addition to broadening

programming possibilities with the use of loops and conditions, this approach allows the IT organisation to capitalise on unified skills, methods and tools (IDE, tests, CI/CD pipeline, etc.). Developments are faster, better controlled, and collaboration between teams is more fluid.

## **Puppet**

### **Hold**

Puppet is a configuration management tool that automates the setup and maintenance of infrastructures as the applications they support evolve. Puppet appeared in 2005 and is one of the most mature and popular solutions in this crowded segment. Widely validated in traditional environments, Puppet suffers from the competition of more recent alternatives, born with the distributed architectures of the cloud and the concept of Infrastructure as Code. The choice of such a tool will therefore depend on the maturity of the company and the trajectory it foresees for its infrastructure.

## **Sovereign Cloud**

### **Assess**

With the rise of national rules, the supraterritoriality of the cloud poses increasing compliance and security challenges. For companies, sovereignty is achieved through the “trusted cloud”, which adds various guarantees to the services (IaaS, PaaS, CaaS, SaaS), particularly

concerning the location of data and the non-justification of extraterritorial regulations. However, depending on its activities, location and strategy, each company has its own perception of sovereignty. For each scope (application, business, geographical area, etc.), it is therefore necessary to establish a risk matrix to select the appropriate services from the cloud providers' catalogues, as well as the ways of operating and securing them.

## Spinnaker Trial

Deploying applications in a multi-cloud environment can quickly get very complex and become the bottleneck of a DevOps approach. Originally developed by Netflix and now open source, Spinnaker allows you to create a single deployment pipeline that is compatible with all major cloud platforms. This makes the deployment process much easier to manage, but also allows it to be separated from continuous integration, enabling teams to work at their own pace. With broad industry support (Google, Microsoft, IBM, etc.) and a very active community, Spinnaker

has quickly established itself as the most solid, agile and rich deployment platform. It is primarily designed for companies that already have a good DevOps practice and that want to accelerate their developments in multi-cloud environments.

## VMware Cloud Foundation Trial

VMware Cloud Foundation is a software suite that enables you to deploy private clouds, locally driven hybrid clouds, or VMware infrastructures on most public clouds (AWS, Azure, GCP, IBM, OVH...). Based on the technologies, principles and tools common to VMware solutions, the VMware Cloud Foundation allows you to capitalise on the knowledge of your teams and service providers, which facilitates and secures the adoption of the cloud prior to a possible application redesign. The most common use cases are the implementation of cloud bursting, the implementation of disaster recovery and business continuity plans (DRP/CBP), and the closure of ageing data centres with a complete and identical port of the virtualized infrastructure.



TechRadar

# Business Automation

Take your business to the next level. Streamline business processes to connect people with more efficient tools and smarter systems.

# Lock or Unlock the future?

Can the technologies presented here put us on the path to a better future? Or do they risk leading us down the wrong road? A look at the perspective of our experts.

## ✓ On the right path...

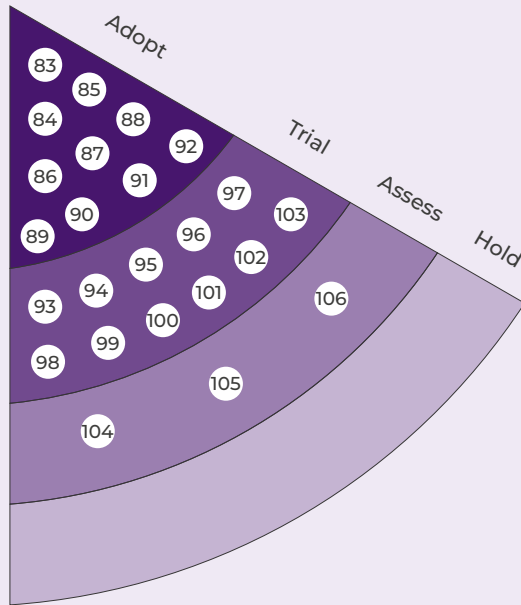
In a world of finite resources, automation is essential to avoid all waste: of materials, energy, time and skills. It enables the implementation and orchestration of new, optimised and dematerialised processes. Freed from thankless tasks and equipped with increasingly powerful no-code tools, employees can invest - and flourish - more in the transformation of the company and of their own business.

## ✗ ... or the wrong path?

We must not underestimate the human dimension of these changes, which challenge habits, raise legitimate fears and put individuals under pressure. For employees, the risk is not so much of losing their jobs to robots as of feeling pressured to be as available and fast as they are. Unlike humans, the machine never gets tired or stops, and letting it dictate the pace of the company means running the risk of serious psychosocial problems.



# Business Automation



## Adopt

- 83. Automation Anywhere
- 84. AWS Step Function
- 85. BluePrism
- 86. Celonis
- 87. Nice
- 88. Nintex
- 89. Outsystems
- 90. Power Apps
- 91. Power Automate
- 92. UiPath

## Trial

- 93. Aifi
- 94. Appsheet
- 95. Automation Hero
- 96. Bizagi
- 97. HyperScience
- 98. Kryon
- 99. Power Virtual Agents
- 100. Rocketchat
- 101. RPA Supervisor
- 102. Vosk
- 103. Workato

## Assess

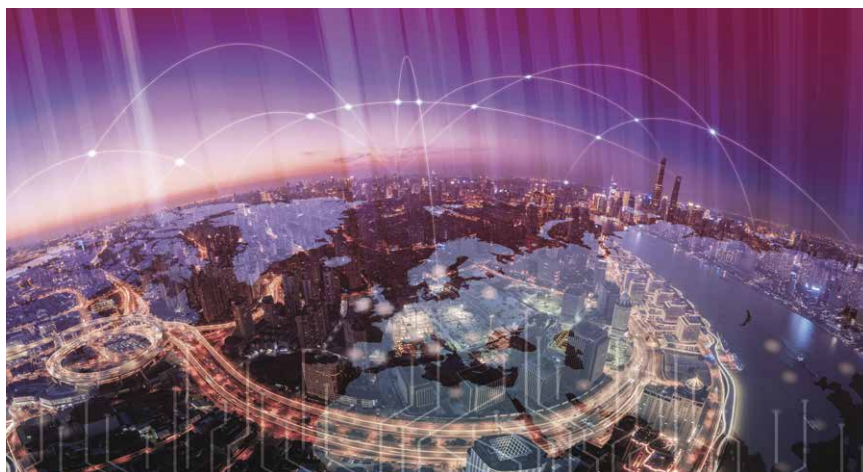
- 104. Dydu
- 105. OpenRPA
- 106. RASA

## Automation Anywhere Adopt

With its Automation 360 solution, Automation Anywhere is one of the major players in RPA (Robotic Process Automation), the fastest growing software segment. Automation 360 is a low-code, cloud-native, user-friendly solution that allows users to easily develop, deploy and manage automated processes, thus relieving them of time-consuming and unpleasant tasks. Automation 360 is useful for all business areas (HR, finance, etc.) and is particularly aimed at large organisations, where the benefits in terms of productivity, quality and user satisfaction are multiplied. In March 2021, Automation Anywhere signed a global technological partnership with Google that will see them closely integrate their respective products and develop joint solutions based on artificial intelligence.

## AWS Step Functions Adopt

AWS Step Functions is a serverless workflow orchestrator. In particular, it allows you to extend the capabilities of AWS Lambda functions by combining them to create complex, robust and massive application processes. Step Functions manages, among other things, the error cases, which makes the code of each function lighter and clearer. It is also possible to restrict functions to elementary tasks, which are easier to maintain, and to present the business logic (loops, conditional branches, etc.) at the level of the Step Functions itself, which can take up to one year to execute. Mature and proven, the use of Step Functions appears to be essential to realise the promises of the serverless paradigm: to develop without worrying about execution conditions and to pay only for the computing resources actually used.





## BluePrism

### Adopt

Blue Prism, founded in 2001, is the historical pioneer of Robotic Process Automation (RPA) and is still one of the major leaders today. Its solution is distinguished by its robustness (which allows it to support complex processes and very large numbers of robots), its highly visual and intuitive interface, its dynamic debugging, and its rich queue management features. On the other hand, Blue Prism appears to be less advanced than some of its competitors in the cloud and in its offer of complementary products such as task or process mining. The platform is nonetheless particularly mature, ideal for the automation of back office processes in large organisations.

## Celonis

### Adopt

Celonis specialises in the exploration, analysis and diagnosis of business process efficiency. Its EMS (Execution Platform System) solution is capable of analysing processes during execution on a large volume of transactions, and identifying, thanks to artificial intelligence, bottlenecks and areas for improvement. With around a hundred off-the-shelf connectors, it also offers the possibility of creating, without development, inter-application integration paths to immediately implement these recommendations. This dual dimension of analysis

and implementation is what makes Celonis unique, and it is developing through numerous partnerships with software publishers, integrators and consulting firms. Recently, Celonis joined forces with ServiceNow and formed a strategic partnership with Accenture.

## Nice

### Adopt

Positioned among the leaders in CCaaS (Contact Center as a Service) by Gartner, NICE offers with CXone a platform that unifies and optimises the customer experience throughout their journey. As soon as contact is made, via a chatbot or by telephone, CXone recognises the customer and directs him or her to self-service tools or an agent, depending on the request and profile. In this case, CXone provides the agent with all the necessary elements to respond effectively. A studio and RPA engine enable end-to-end automation of processes, boosting productivity while letting agents focus on the relational dimension of their work. Finally, thanks to its analysis and back-office management tools, the contact centre optimises its operations and resources according to needs in order to improve service quality and control costs.

## **Nintex** Adopt

Nintex offers a platform dedicated to automation of business processes based on three main pillars: process management, automation and optimisation. With the Promapp module, the organisation can map and visualise its processes, manage and control their evolution, and ensure their governance. Thanks to a library of standard connectors and integrated functionalities such as electronic signature and document editing, the automation module makes it easy to create and execute complex workflows. Ultimately, Hawkeye, the optimisation module, provides visibility into process efficiency to enhance performance. The Nintex platform is easy to integrate and use, and is particularly suited to optimising and automating largely manual processes, such as those found in finance, HR or marketing.

## **Outsystems** Adopt

Founded in 2001 in Lisbon, OutSystems is the publisher of a low-code development platform that helps companies create, deploy and manage their applications quickly and easily. The solution provides a full range of visual tools, as well as automation and support services based on artificial intelligence, to speed up and make reliable the entire application lifecycle. The applications developed with

Outsystems can be deployed on-premises or in the cloud, where they benefit from the best possible execution environment. Depending on the requirements, Outsystems can also be used to implement all necessary security, compliance and performance features at scale. OutSystems is extremely powerful and is aimed at IT professionals, who can benefit from significant productivity and quality gains. Very recently, Outsystems has launched “Project Neo”, their new platform which generates Kubernetes applications and therefore brings the speed of low code to cloud-native applications.

## **Power Apps** Adopt

Microsoft's low-code/no-code solution, Power Apps allows both casual and professional developers to easily create basic (Canvas) or more elaborate (Model Driven) applications. Power Apps is based on the tools of the Power Platform, such as Dataverse (cloud database), AI Builder (intelligent modules) and, above all, Power Automate, the inseparable complement to Power Apps to which it brings its capabilities for automating and linking tasks and processes. Power Apps also benefits from its natural integration with Microsoft's collaborative work environment and over 400 connectors to various data sources. All of this makes it possible to develop applications that are closer to the needs of users

more quickly, at a lower cost and in a more agile manner, provided that appropriate governance has been put in place upstream.

## **Power Automate** Adopt

Formerly Microsoft Flow, Power Automate is Microsoft's cloud-based RPA solution. Flexible, graphical, intuitive and highly robust, Power Automate enables users without programming skills to build and maintain automated processes, from the most mundane

day-to-day tasks to the most complex business logic. For this reason, Power Automate is tightly integrated with Microsoft 365 and Power Platform tools, and has standard connectors for a large number of cloud services (if necessary one can create one's own connectors). With AI Builder, Power Automate also allows the integration of artificial intelligence capabilities, such as text or image recognition. Although limited, the Power Automate licence included in Microsoft 365 offers the possibility to test and use the solution easily, and to take the first steps in RPA.



## UiPath Adopt

Across many organisations, there are many processes that are based on repetitive, low-value-adding tasks. In recent years, automating these processes has become the holy grail of productivity and operational efficiency, so that RPA (Robotic Process Automation) is now the fastest growing area of enterprise software. UiPath is the undisputed market leader in this area according to various analyst firms, offering an end-to-end solution, from the discovery of processes and automatable tasks to the design, integration, execution and management of the robots. What is the only risk? Automating processes that are not optimised in any systematic way. However, with the right support, UiPath delivers a proven and rapid return on investment, and is a technology that no company should ignore any longer.

## Aifi Trial

Thanks to a computer vision system, AiFi univocally identifies each customer in a point of sale as well as the products they pick up or put down on the shelves. The customer, who has registered with their mobile phone when entering the shop, can then pay for their purchases automatically and without contact when leaving. Customers benefit from a faster, smoother shopping experience while stores can remain open 24/7 without the need for checkout staff. The system was designed with absolute respect for privacy and compliance with current regulations (RGPD, CCPA). It does not use facial recognition and does not store any biometric data. AiFi has already deployed its technology in dozens of shops around the world.



## Appsheet

### Trial

No-code development will be a major challenge for the years to come, as it helps to overcome the shortage of developers by giving businesses the ability to create the digital applications they need more quickly. Google, which is positioned in this market like all the major players, acquired the specialist AppSheet in January 2020. AppSheet is a no-code tool for citizen developers, allowing them to build web and mobile applications in a few days around numerous data sources (Google Sheet, Excel, Salesforce, MySQL, etc.). Appsheet offers turnkey functionalities and ready-to-use artificial intelligence components (character recognition, predictive models, etc.) to automate processes, as well as governance tools, which are essential to support the democratisation of development.

## Automation Hero

### Trial

AutomationHero combines RPA (Robotic Process Automation) and artificial intelligence to automate all types of processes, from the most basic non-assisted tasks to the manual processing of complex documents such as invoices and contracts. In addition to a tool for process mining, AutomationHero offers an intuitive no-code interface, and a set of ready-to-use connectors and actions. Above all, AutomationHero makes it easy to incorporate artificial

intelligence into its processes by means of predefined models (character recognition, document classification, data extraction, etc.) that can be parameterized. In the case of assisted automation, AutomationHero offers a customised interface, called Robin, that allows users to keep control of the process.

## Bizagi

### Trial

Bizagi is a Business Process Management (BPM) platform that includes a process mapping and modelling tool, a low-code studio for creating automated processes, and an engine for running and orchestrating them. In order to accelerate development, Bizagi also offers process models, components and turnkey connectors (more than sixty). These combined solutions allow complex business processes involving humans, robots and systems to be optimised and automated from start to finish. Bizagi was founded in 1989 and has more than 1,000 customers in a wide range of industries.

## HyperScience

### Trial

HyperScience uses artificial intelligence to extract useful information from scanned documents, thus avoiding time-consuming and error-prone manual re-keying. HyperScience processes scanned forms as

well as low-resolution images or PDF documents, handwritten text as well as printed or typed characters. The platform uses the data collected to create and automate processes connected to the company's various applications. Hyperscience is of particular interest to activities that process large volumes of paper documents, such as invoice management, mail sorting, claims and reimbursement processing, or identity verification, for which the productivity and quality gains can be considerable.

## **Kryon** Trial

Kryon is a Robotic Process Automation (RPA) platform that covers the entire lifecycle of automation projects. This includes everything from automatic discovery and mapping of processes and detection of optimisation opportunities to simplified creation of automated processes using a low-code tool and a library of predefined actions and connectors. Kryon also covers execution and orchestration of robots and facilitates reporting, analysis and management via a centralised console. The Kryon platform allows for the automation of both assisted (requiring human intervention at certain stages) and unattended (robots operate completely autonomously) processes, expanding the possibilities of RPA and maximising its benefits. In February 2022, Kryon was acquired by its competitor Nintex.

## **Power Virtual Agents** Trial

Power Virtual Agents are chatbots integrated into Microsoft Teams, which make it possible to equip and make interactive various needs for assistance: first level support, requests for information - as a company navigator that helps employees to find important information and as an interactive FAQ assistant about a tool, a product or a project. As a code-free solution, Power Virtual Agents makes it easy to define the dialogue stages (greeting, trigger expressions, escalation, etc.) for this type of use case based on pre-existing knowledge bases. Despite its limitations (lack of multilingualism, for example), Power Virtual Agents offers many possibilities for improving both the productivity of support services (which can focus on cases where a human presence is required) and the user experience (which benefits from accessible and immediate information).

## **Rocketchat** Trial

Rocket.chat is a chat platform that provides companies with all the guarantees they need to make instant communication a daily tool. In addition to real-time chat, it allows for audio and video communications, and file sharing. Exchanges are end-to-end encrypted, and the company retains full control over its data. Finally, Rocket.chat is entirely open

source and allows for all kinds of customisation and integration, particularly with social networks, productivity tools and chatbots. Rocket.chat can therefore be used for all sorts of purposes: remote working, communication within DevOps teams, unification of customer service channels, technical support, etc. Rocket.chat is a mature solution that is widely used in companies and has over 12 million users in 150 countries.

### **RPA Supervisor** Trial

RPA Supervisor is a robot orchestration tool that can be connected to most RPA platforms

(Blue Prism, UiPath...). The solution relies on artificial intelligence to optimise task scheduling and resource allocation according to business priorities. In case of failure or error, RPA Supervisor reacts automatically to maximise the availability of robots. The solution also allows the monitoring of usage data and performance indicators necessary to evaluate the return on investment. RPA Supervisor is a fairly young product, which is probably not yet fully mature, but its Norwegian publisher is very keen to listen to its customers and partners to improve it. The more robots become popular and important, the more this type of tool will be indispensable for managing the challenges of their profusion.

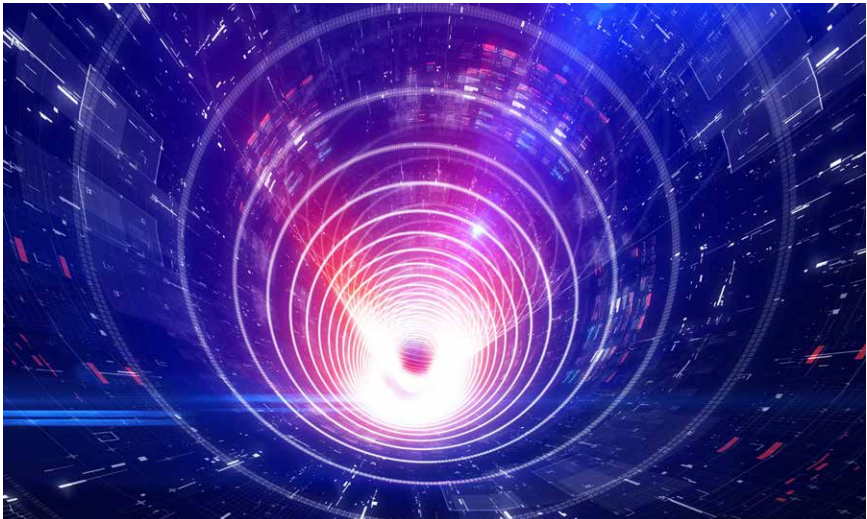


## Vosk Trial

For practical or regulatory reasons, it is not always possible to use cloud-based speech recognition solutions. To remedy this, VOSK offers an offline tool that can transcribe audio files in more than 20 languages. VOSK's language templates are only 50 MB each, making it suitable for use on mobile devices such as the Raspberry Pi, iOS or Android. VOSK is also distinguished by its simplicity of implementation. The counterpart of this lightness is a transcription that is still rather basic (to date, punctuation is not taken into account, for example), which would tend to reserve VOSK for the time being for non-critical use cases such as transcribing the words of customers in a call centre.

## Workato Trial

Workato is a leading provider of cross-application integration use cases that enable code-free integration with the most popular business applications on the market. Workato develops and maintains an extensive library of connectors (more than 600 to date) and a catalogue of integration use cases (recipes), both of which are supported by their community of partners. This allows a business user, without technical expertise, to configure integration paths either by implementing existing recipes or by creating their own integration scenarios using drag-and-drop connectors. Positioned for the fourth consecutive year by Gartner as a leader in iPaaS integration, Workato has already convinced more than 11,000 customers.





## Dydu

### Assess

The French editor Dydu offers a solution for building automated 24/7 intelligent conversational solutions, chatbots, callbots or voicebots. Thanks to its proprietary Natural Language Processing (NLP) algorithm, users can communicate with the bot as they would with a human being, without being forced to use predefined keywords or scrupulously respect spelling, for example. This user-friendliness improves the user experience, facilitates the insertion of the bot into omnichannel paths and allows all the expected benefits to be reaped, whether in terms of customer satisfaction, productivity of support teams or cost reduction. Low code, the Dydu solution gives business teams the possibility to create, administer and continuously improve their bot in complete autonomy.

## OpenRPA

### Assess

OpenRPA is an RPA (Robotic Process Automation) engine, which is positioned as an open source alternative to the solutions of the major players in the field (Automation Anywhere, Blue Prism, Microsoft, UiPath, etc.). OpenRPA is a young tool, developed by the Danish publisher OpenIAP on the most recent technological standards (Kubernetes/Docker, MongoDB, etc.), which undoubtedly still lacks

maturity, but which already offers some very interesting features. And, as it is free, you can try it without risk and evaluate the potential of automation.

## RASA

### Assess

Rasa is a platform for creating virtual assistants, chatbots, voicebots and callbots. The German publisher offers two versions, Rasa X (free) and Rasa Enterprise (paid and more complete), the understanding (Rasa NLU) and dialogue (Rasa Core) engines on which they are based being open source. Together with the possibility of deploying Rasa containers on site (VM) or in the cloud (Kubernetes), it allows companies to retain complete control over their bots and data, and thus guarantee compliance and confidentiality. Powerful, accessible and relatively easy to use, Rasa is an alternative to the tools of the big players (Google, IBM, Microsoft, etc.) and enables all companies to integrate conversational agents into their internal (IT support, HR portal, collaborative platforms, etc.) and external (customer service) communication channels.

TechRadar

# Trust & Cybersecurity

Inspire confidence with a 'digital trust at scale' strategy. Understand your evolving threat landscape and swiftly address risks to evolve with adequate measures and ultimate security features.

# Lock or Unlock the future?

Can the technologies presented here put us on the path to a better future? Or do they risk leading us down the wrong road? A look at the perspective of our experts.

## ✓ On the right path...

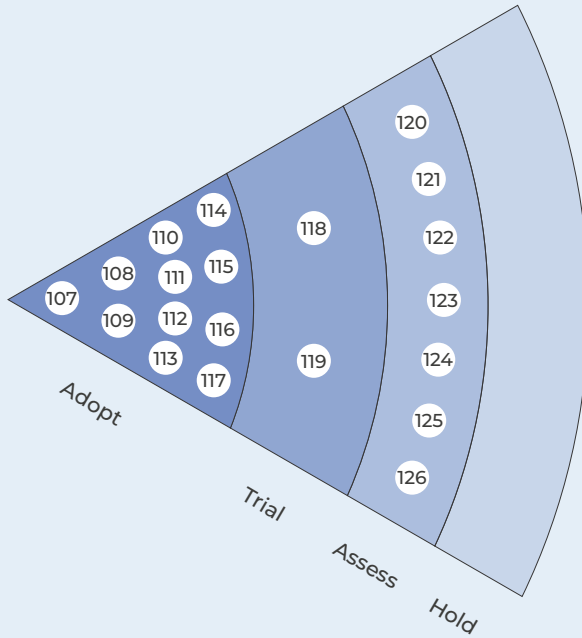
The shift towards increasingly digital business and operational models is creating new vulnerabilities and risks. Without adequate security and compliance measures, organisations not only expose themselves to considerable damage, but will be unable to build the trust among their customers and employees that is essential for the widespread and sustained adoption of new digital services. However, the maturity of the tools and a growing awareness of the issues at stake may give reason to hope that cybersecurity will no longer be treated as a separate issue, but rather as a differentiating and value-creating factor from the moment new services are defined.

## ✗ ... or the wrong path?

Despite the continued fragmentation of security capabilities, the technologies and concepts are ready to address current and future cyber security challenges, but are the minds? Humans remain the weakest link in all cyber arrangements, and this cannot be solved by a pile of tools. Just as awareness of the dangers of the sea permeates every gesture and every decision on board a ship, the culture of cybersecurity must become a fundamental asset at all levels of the organisation, from strategic choices to daily practices.



# Trust & Cybersecurity



## Adopt

- 107. Aviatrix
- 108. Azure Sentinel
- 109. Checkmarx
- 110. CryptoNext
- 111. CyberArk
- 112. ForgeRock
- 113. Hashicorp Vault

- 114. Microsoft Defender
- 115. Omada
- 116. Reach5
- 117. UserCube

## Trial

- 118. Darktrace
- 119. Netskope

## Assess

- 120. CryptoSense
- 121. Deep Instinct
- 122. Devo
- 123. Lacework
- 124. Okta
- 125. Otorio
- 126. Salt

## Aviatrix Adopt

With each cloud vendor offering its own network connectivity tools while providing very few visibility tools, it is difficult to deploy consistent flow management, security or resource allocation policies in a multi-cloud environment. Aviatrix's solution is to define a unified network and security architecture overlaying the different clouds. Hiding the specifics and limitations of each underlying cloud, Aviatrix gives network and security teams the visibility, control and power they had in their own data center. This allows them to deploy advanced and consistent network and security features such as end-to-end encryption or active/active mode for high availability across different clouds. Aviatrix also simplifies the adoption of a unified segmentation strategy based on traditional firewalls.

## Azure Sentinel Adopt

Azure Sentinel is a cloud-based Security Information Event Management (SIEM) and Security Orchestration, Automation and Response (SOAR) solution that centralises and processes the data collected by various security devices, and coordinates and optimises the technical and organisational response to threats. Using artificial intelligence and Microsoft's experience in cybersecurity, Azure Sentinel provides analytical insight and automation capabilities that result in improved operational efficiency and a more robust incident response. Based in the cloud, Azure Sentinel easily supports changes in scope while keeping costs under control. Azure Sentinel is a solid and proven solution, particularly at ease in predominantly Microsoft environments.



## Checkmarx

### Adopt

Application security starts at the code level, which must leave as few gaps as possible for perpetrators. Checkmarx offers static code analysis (SAST), interactive code analysis (IAST) and dependency analysis (OSA) tools that identify vulnerabilities, assess their level of criticality and suggest remediation actions. With the recent acquisition of Dustico, a software supply chain security specialist, Checkmarx relies on the complementary expertise of its partners - such as Devoteam - to help developers filter the results by providing them with really useful recommendations, and by accompanying their increase in skills on good security practices, notably through CodeBashing, the e-learning tool. It is not uncommon to observe a rapid reduction of 50% to 70% of vulnerabilities.

## CryptoNext

### Adopt

It is well known that the traditional public key encryption devices (RSA-2048) will not withstand the quantum computers announced for 2023. Some hackers are therefore already collecting encrypted data and intend to decrypt it as soon as they get that power. Fortunately, research has uncovered mathematical problems that can defeat

quantum computers. The French startup CryptoNext has used one of them to develop a hybrid post-quantum cryptographic library to protect itself today from classical computers and, when necessary, from quantum computers.

Companies with sensitive data (health data, intellectual property, etc.) with a lifespan of more than fifteen years should be aware of the emerging quantum risk and evaluate CryptoNext as a means of coping with it.

## Cryptosense

### Assess

With the multiplication of cryptographic uses, it becomes necessary to centralise information in order to have complete visibility of keys, algorithms, protection mechanisms, etc. Without this, there is a risk, for example, of using a key that is out of date with respect to internal policy and/or the regulatory framework, and thus creating a vulnerability. A pioneer in Cryptography Lifecycle Management (CLM), Cryptosense provides inventory, management and compliance monitoring of cryptographic resources. Designed primarily for security teams, Cryptosense is also an operational tool that allows developers to use cryptography in a simple and secure way. Cryptosense's solutions are primarily designed for mature companies, such as banks, healthcare and sensitive industries, where encryption control is a major issue.

## **CyberArk** Adopt

For hackers, confidential information (passwords, certificates, encryption keys, etc.) and the rights of privileged accounts (administrators, managers, etc.) are priority targets, as obtaining them can immediately give them considerable power. This very specific information therefore requires reinforced control and separate management. Recognised by Gartner as a world-class leader in this delicate area, CyberArk offers a centralised and automated privilege as well as a secret management platform that covers all identities, endpoints and systems in all types of scenarios (hybrid, multi-cloud, SaaS). CyberArk helps to protect against identity and rights violations (involved in 80% of cyber attacks), to comply with regulatory requirements, and to secure digital collaborative processes without burdening them.

## **Darktrace** Trial

A pioneer in the use of AI for cybersecurity, Darktrace identifies unusual behaviour as well as threats that have already been identified. Thanks to machine learning, Darktrace can accurately characterise the usual functioning of the information system, extended to the cloud, and thus immediately detect suspicious anomalies with very few false

positives. This innovative approach allows us to respond as early as possible to all attacks, including the most sophisticated. Darktrace offers a detection solution (Enterprise Immune System), which can feed a SIEM; automatic remediation solutions (Antigena Network, Antigena Email), which respond in a rapid, targeted and proportionate manner as soon as a threat is detected; and Cyber IA Analyst, a solution that filters, reconciles and synthesises security information to facilitate and accelerate its analysis by teams.

## **Deep Instinct** Assess

The objective of cybersecurity has always been to intervene as quickly as possible after the detection of incidents, but Deep Instinct proposes to go even further and stop them before they even take place! Thanks to deep learning, the Israel-based editor believes it is possible to detect the early signs of a malware deployment, even an unknown one, and to block it in less than 20 ms, i.e. before it has had the time to start executing. After focusing primarily on the security of information system entry points, Deep Instinct is now extending its preventive approach to the main attack vectors: files, applications, gateways, etc. Although the concept is very attractive, the solution is still in its infancy - and costly - and must therefore be evaluated in an operational context.

## Devo Assess

Devo is a modern, cloud-based, next-generation SIEM (Security Incident Events Management) system that is easy to deploy and has very strong analytical capabilities to process data from security tools in real time, detect incidents and assess threats based on context. Its flagship reference, the US Air Force, attests to its strength and performance. In addition to security, Devo also provides a real-time view of the functioning of the information system and analyses its use and performance to optimise operations. Finally, Devo offers an attractive pricing model, which could widen access to this type of solution, usually reserved for very large accounts. This would in any case be invaluable for small and medium-sized companies, which are particularly affected by the delays they often experience in detecting incidents.

## ForgeRock Adopt

ForgeRock is an identity and access management (IAM) solution that secures the access of people and entities to all systems and applications, on-premises and in the cloud. ForgeRock's comprehensive platform includes identity governance and administration, identity federation, multi-factor authentication (MFA), single sign-on (SSO), consent management, API and endpoint security, and many more. Initially built on Sun OpenSSO, it is also a tool that has proven its robustness, flexibility and performance in the most demanding business environments such as banking, healthcare and telecoms. Today, ForgeRock, which was founded in 2010, is the only IAM provider ranked as a leader by the three main analyst firms.





## HashiCorp Vault

### Adopt

HashiCorp Vault is a tool for centralising the secrets (passwords, certificates, encryption keys, tokens, etc.) needed by applications to access protected resources. Secrets are stored, encrypted and auditable. HashiCorp Vault manages their generation, rotation, renewal and destruction in an automated manner in accordance with corporate security policies. This allows the life cycles of secrets and applications to be decoupled, as applications only need to be authenticated to access secrets. This means that developers no longer have to know about them, copy them, hard-code them or worry about them expiring, resulting in considerable productivity and security gains. However, the implementation of such a centralised management of secrets has significant organisational impacts and requires support.

## Lacework

### Assess

Lacework uses data and AI to improve cloud security. Its technology, called Polygraph, continuously monitors the application environment and identifies deviating behaviour. Thanks to the data at its disposal, the solution is then able to analyse the origins of the anomaly and assess its level of criticality before launching an alert, if that's necessary. The finesse of the analysis allows it to eliminate false positives and to focus on the most critical incidents, which Polygraph allows to treat with all the more efficiency as it provides a detailed report on their nature, their origins and their implications. This close monitoring also makes it possible to follow the evolution of the configurations of the various components and to indicate when they are not in conformity with the rules of the company.



## Microsoft Defender

### Adopt

Microsoft Defender, the former name of Microsoft's antivirus, now refers to Extended Detection and Response (XDR) technologies dedicated to the user environment. Microsoft Defender prevents, detects and neutralises threats to identities, terminals, applications, e-mails and documents, relying on artificial intelligence and the expertise that the supplier draws from its vast installed workstation base. Microsoft Defender stands out for its effectiveness against malware and the exploitation of security holes, its speed of reaction and its low false positive rate. Thanks to its agent-based architecture, it works on all types of terminals without burdening their resources. The solution has matured considerably since its launch and is now considered by analysts to be a frontrunner in endpoint security.

## Netskope

### Trial

Netskope is a leading player in SASE (Secure Access Service Edge), an approach to cybersecurity that addresses the atomisation of systems and usage in the cloud era. SASE is a cloud-based security architecture that delivers the network and security services needed to protect data, applications and users in a context-sensitive manner, without compromising experience or performance. Netskope's Cloud

Security Platform provides the essential building blocks of a SASE model: Zero Trust Network Access (ZTNA), Secure Web Gateway (SWG), Firewall as a Service, Cloud Access Security Agent (CASB), Continuous Monitoring of Cloud Services (IaaS, PaaS, SaaS), Data Leakage Prevention (DLP). As part of a Zero-trust approach, Netskope gives security teams back control over every application transaction, whether it is performed on internally hosted applications or on external platforms (SaaS, IaaS or PaaS).

## Okta

### Assess

Already a recognised reference in identity and access management (IAM) and ranked by Gartner as one of the leaders in the field, Okta has further strengthened its position with its recent acquisition of Auth0, a specialist in customer IAM. Around its Identity as a Service platform (IDaaS), Okta provides all the necessary building blocks to secure and simplify connections for all types of users: workflows and simple provisioning, identity lifecycle management, directory, access controls, Single Sign-On (SSO), securing APIs through access, securing access to resources in hybrid and multi-cloud infrastructures, and more. In particular, Okta enables the implementation of ZeroTrust approaches that maximise security in complex digital environments. Devoteam is an Okta partner.

## **Omada** Adopt

As organisations migrate to the cloud, they need visibility into every platform, application, service and user. Cloud governance is a set of policies and controls to manage user access, compliance, and reduce security risks in a multi-cloud environment. It must include the discovery, modelling, management, and control of access to all applications, resources, and data in the cloud. The Omada Identity Cloud SaaS solution provides identity and access governance, risk management, compliance, role-based access management, and process governance services. It enables organisations to ensure compliance, reduce risk exposure and maximise efficiency by providing policies, processes and solutions to meet governance requirements. Omada is considered a leader in the identity governance and administration (IGA) market by analyst firms Gartner and Forrester.

## **Otorio** Assess

Accelerated by the rise of 5G and IoT, the convergence between information systems (IT) and industrial systems (IIoT) poses increasing threats to the latter. Israel-based Otorio focuses on this emerging issue with three solutions. The first is RAM2, a Security Orchestration, Automation & Response (SOAR) platform that inventories

equipment, centralises data from sensors and security tools, assesses risk and compliance, and takes appropriate action. The second is pOT, which manages the risks and vulnerabilities of individual devices, including those isolated from the network. And the third is remOT, which secures the connections of remote users, for example during maintenance operations. For manufacturers, this is a player that deserves to be watched with all the more interest as it has few competitors.

## **ReachFive** Adopt

As a key step in the customer journey, authentication must be seamless enough to not compromise the user experience and secure enough to inspire trust. ReachFive meets this dual requirement with its Customer Identity and Access Management (CIAM) platform, which manages identity and consent management, authentication and access control, and identity federation in multi-channel and multi-brand journeys. ReachFive also connects to back-offices (CRM, marketing, etc.) to enhance the value of connection data and personalise the experience. ReachFive is a French provider with a large number of references in the retail sector, validating the relevance, reliability and robustness of its solution, which is able to withstand heavy seasonal loads. According to Forrester, the ROI of the ReachFive solution can reach 333% in 3 years.

## Salt Assess

The proliferation of APIs creates new offensive domains that are less and less controllable manually or with traditional tools such as Web Application Firewalls (WAFs). Dedicated to API security, the SALT platform collects all API traffic in order to map their endpoints, identify the nature of the data exchanged and detect anomalous behaviour. SALT enables security teams to detect API vulnerabilities, assess the risks, and respond quickly and effectively. Although still in need of development, SALT is an innovative solution that fills a blind spot in security systems and earns the attention of companies, like those in the banking sector, for example. However, SALT is primarily intended for organisations that are mature in application security and already have a SOC/SIEM.

## Usercube Adopt

In large organisations with high staff turnover, it is vital to keep rights and entitlements up to date. Without it, there is a risk of disrupting the business by denying legitimate actions or, on the contrary, of weakening security by leaving unauthorised rights open. Thanks to its IGA (Identity Governance & Administration) solution, Usercube enables the automation and reliability of the complex and time-consuming management of authorisations and access. Connected to source systems (HR, general services, etc.), the solution allows for the establishment of user identities, can use artificial intelligence to create and assign the appropriate authorisations and open up the corresponding rights in the applications. Regular renewal ensures that rights are up to date, while a management system provides a 360° view of individual rights and manages special cases.



TechRadar

# Sustainability Enabled by Digital

Turn ESG theory into action. Understand your impact, implement responsible strategies throughout your company and discover untapped potential through sustainable practices.

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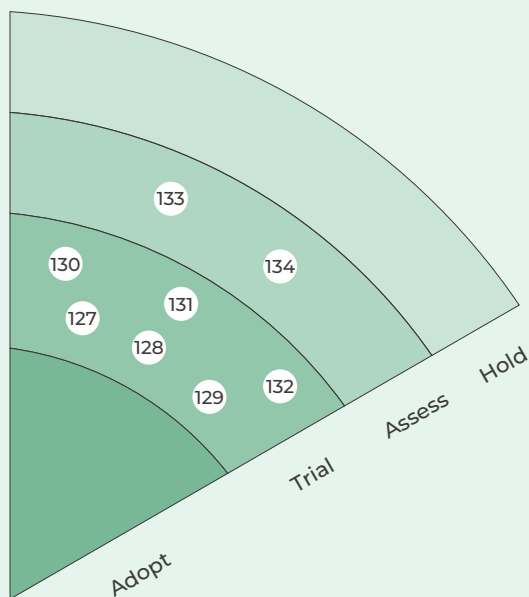
Technology increasingly offers tools to measure, monitor, improve and report on the societal and environmental impacts of economic activities. This is a decisive step forward in guiding, streamlining and scaling up sustainable development policies and putting an end to catalogues of good intentions, isolated initiatives and greenwashing. It is also a formidable lever for innovation to transform ways of doing things and adopt more responsible practices.

## ✗ ... or the wrong path?

While dematerialisation saves natural resources, digital technology must not forget that its own environmental footprint (greenhouse gas emissions, but also water, metals, pollution, etc.) is growing at an unsustainable rate. Its growth also raises major societal issues such as the digital gap, lack of literacy and accessibility. This is why responsibility must be shared by all, from technology providers to end users. In particular, a whole culture of accelerated obsolescence of technologies must be challenged.



# Sustainability Enabled by Digital



## Trial

- 126. Aguaro
- 127. Energisme
- 128. Google Carbon Assessment
- 129. Microsoft Cloud for Sustainability
- 130. Salesforce Net Zero Cloud
- 131. ServiceNow ESG

## Assess

- 132. Eco Vadis
- 133. Zutacore

## **Aguaro** Trial

Aguaro is a French company whose solution, My IT Footprint, helps organisations manage their end-to-end journey towards more sustainable IT. Based on ServiceNow (Build-on-Now), My IT Footprint takes advantage of the automation and integration capabilities of the Now platform, as well as the data it contains on the IT assets and usage, to accurately measure the environmental impact of IT (greenhouse gas emissions, waste, etc.). My IT Footprint enables organisations to define their strategy for more responsible IT services, identify and implement concrete actions, measure progress, and communicate reliable and transparent results. In addition, it is a tool for raising awareness and driving change, and for including environmental concerns in all IT projects and practices.

## **EcoVadis** Assess

In order to benchmark themselves against their peers, guide their policies and measure their progress, companies need to assess their social and environmental performance. EcoVadis was founded in 2007 and has developed a unique methodology for assessing corporate sustainability based on international standards such as the Global Reporting Initiative, the

United Nations Global Compact and ISO 26000. Covering twenty-one criteria divided into four themes (environment, social, ethics, responsible purchasing), this assessment is based on a personalised questionnaire, third-party information sifted through artificial intelligence, and expert analysis, and results in a summary report and avenues for improvement. This global approach is complementary to more targeted approaches, like Green IT. EcoVadis currently has more than 85,000 rated companies.

## **Energisme** Trial

With its SaaS platform N'Gage, Energisme puts data and artificial intelligence at the service of energy performance, whether on the scale of a building, a production site or an urban complex. The solution collects data associated with all types of use (heating, lighting, industrial production, IT, etc.), regardless of their source (meters, IoT, management systems, etc.) and the nature of the fluids (water, gas, electricity, steam, etc.), then consolidates and analyses them to enable real-time management of consumption. With its predictive models, Engage also enables organisations to implement a sustainable optimisation strategy across practices, infrastructure and supply contracts. Energisme relies on its own data integration engine, developed and marketed by its subsidiary Loamics.



## Google Carbon Assessment Trial

For more than a decade, Google has been investing massively to reduce the environmental impact of its activity, which has enabled it to lower the overall PUE (Power Usage Efficiency) of its data centres to 1.10, compared with an average of 1.67 for the world's major data centres. With Google Carbon Assessment, Google is helping companies measure the carbon footprint of their own data centres and identify ways to improve, particularly by moving to the cloud. The tool is inexpensive and non-intrusive, and provides valuable information for CIOs wishing to embark on a green IT journey. However, its ease of use depends on the type of infrastructure: easy with VMware environments, more delicate with Linux servers and strict security rules. In all cases, support is still needed for more precise measurements and recommendations.

## Microsoft Sustainability Cloud Trial

In order to reduce their greenhouse gas emissions, companies need figures above all in order to be able to direct and monitor their actions. An SaaS solution based on Microsoft tools (Azure, Power Platform, etc.), Microsoft Cloud for Sustainability enables them to collect and aggregate operational data to assess their direct and indirect emissions (Scopes 1, 2 and 3), to identify the sources of CO<sub>2</sub> on which mitigation measures should be focused as a priority, and to establish a targeted and quantified strategy. Through summary reports and dashboards, the company can then visualise and report on the environmental impact of its activities and value chain, and measure its progress in near real time. They can then find out how to make progress in their efforts to reduce emissions, improve efficiency and make sustainable changes.





## Salesforce Net Zero Cloud Trial

The Salesforce Net Zero Cloud is designed to monitor an organisation's overall energy consumption, CO2 emissions, and renewable energy use. Using the Einstein Analytics artificial intelligence engine, Net Zero Cloud can calculate greenhouse gas emissions, analyse the numbers, and quickly produce accurate environmental reports for audit and management purposes. The company is then able to make informed decisions and commitments to reduce its environmental footprint and drive large-scale climate change programmes.

## ServiceNow Integrated ESG Trial

In response to the urgency of the issues and the growing expectations of stakeholders, Integrated ESG helps companies turn their CSR commitments into concrete initiatives and report on their actions with rigour and transparency. Based on the Now platform, this operational control tower allows companies to set CSR objectives, define and measure performance indicators, and publish results in accordance with current reporting standards; build a roadmap, manage projects and assess their impact; and identify and address CSR-related risks, from regulatory compliance to brand image. Thanks to ServiceNow's expertise

in integrating elements from multiple enterprise applications and its rich ecosystem, Integrated ESG covers all CSR topics, not just environmental.

## ZutaCore Assess

Data centres account for between a quarter and a third of corporate IT energy consumption. However, the PUE (Power Usage Effectiveness), which measures their energy performance, is on average around 1.5 compared to less than 1.1 for the best. There is therefore significant room for improvement, including innovative cooling techniques. This is why Zutacore has developed HyperCool, a liquid cooling solution that brings the fluid directly to the chip, where it dissipates heat by evaporation. Highly energy-efficient and very compact (making it particularly suitable for dense equipment and limited space), HyperCool can be deployed at the server, rack or data centre level, including on existing systems. The company claims that its solution achieves a PUE of 1.02.

# About Devoteam

Devoteam is a leading consulting firm focused on digital strategy, tech platforms and cybersecurity. By combining creativity, tech and data insights, we empower our customers to transform their business and unlock the future.

With 25 years' experience and more than 8,500 employees across Europe, the Middle East and Africa, Devoteam promotes responsible tech for people and works to create better change.

**Creative tech for Better Change**





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Creative tech for Better Change