

CloudPerfect Survey – Cloud computing perception of the CAE users

Introduction

This survey was held by the research project “CloudPerfect” (<http://CloudPerfectCloudPerfect.eu/>), funded in the context of EU H2020 (ICT 6 2016) research and innovation programme, under Grant Agreement No 732258.<http://CloudPerfectCloudPerfect.eu/>), funded in the context of EU H2020 (ICT 6 2016) research and innovation programme, under Grant Agreement No 732258.

The prime goal of the survey was to learn more about the pains of the cloud services currently offered from the Computer Aided Engineering (CAE) user point of view. Furthermore it allowed establishing the requirements and interests of the current or potential cloud customers regarding the future cloud compatibilities.

Methodology

The survey was structured in three sections.

The first one is composed of 6 closed-ended questions, was dedicated to the collection of general information about the participants and to sort them between section two (potential cloud adopters) and section three (cloud adopters).

Section two is composed of 4 closed-ended questions to the potential adopters, it helps to identify the reasons why they never used cloud services before.

Section three is composed of 6 closed-ended questions to the cloud adopters; it collects their feedbacks about the platform they use, their pros and cons.

The questionnaire was designed using Google Modules and distributed sharing link via e-mail, LinkedIn and Twitter.

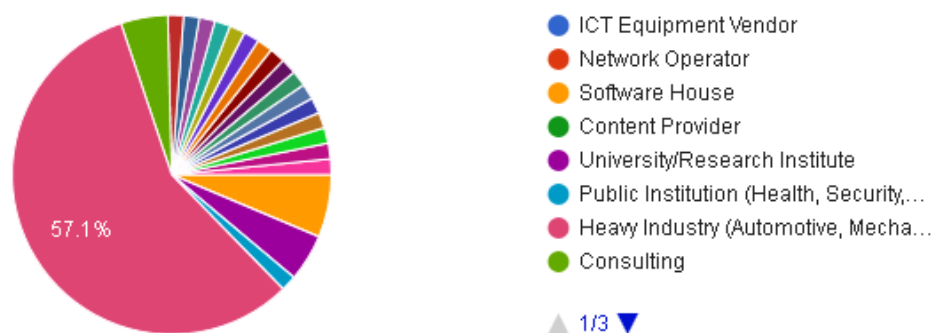
General questions

The survey involved 63 users, from the following sectors: Heavy Industry (Automotive, Mechanical equipment etc.), Consulting, Consumer products, CAE Engineering Consulting and Software development, Design and Development, HPC services, Public Institution (Health, Security, Municipality, etc.), R&D for consumer goods, Software House, University/Research Institute.

The main sector results to be the Heavy Industry (Automotive, Mechanical equipment etc.) with 57.1% of the share.

What is your company's field of operation?

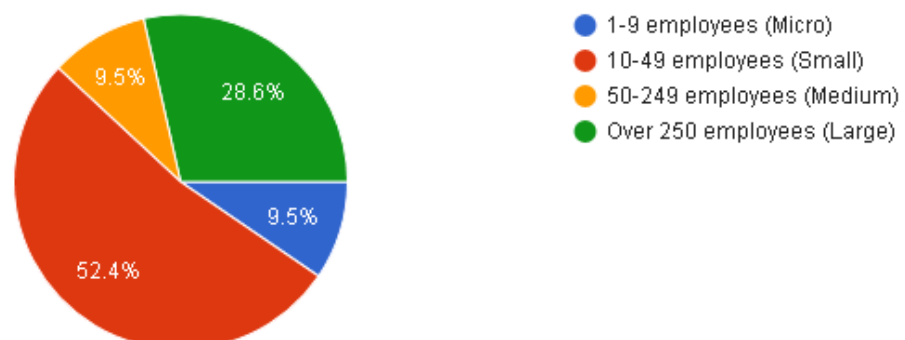
63 responses



52.4% of the respondents to the questionnaire work in organization with 10-49 employees (small business) followed by 28.6% from large business (over 250 employees). The remaining percentage equally subdivided between users belonging to micro and medium companies.

What is the size of the organization that you represent?

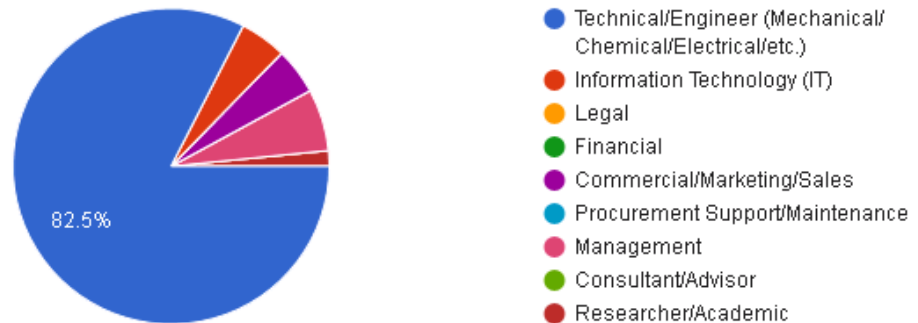
63 responses



The respondent majority have technical role in the organization with CAE background, belonging to the survey's target group.

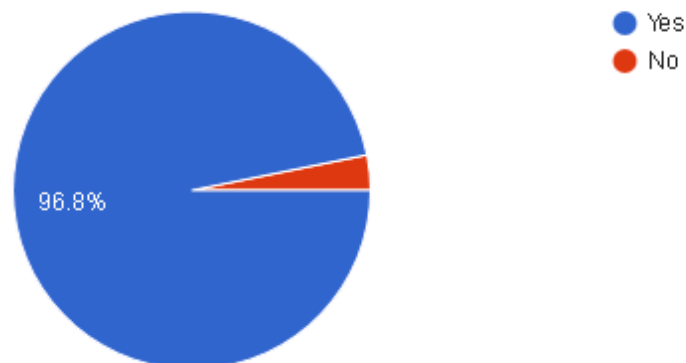
What is your role in your organization?

63 responses



Have you ever used CAE (Computer Aided Engineering) tools for simulation purposes?

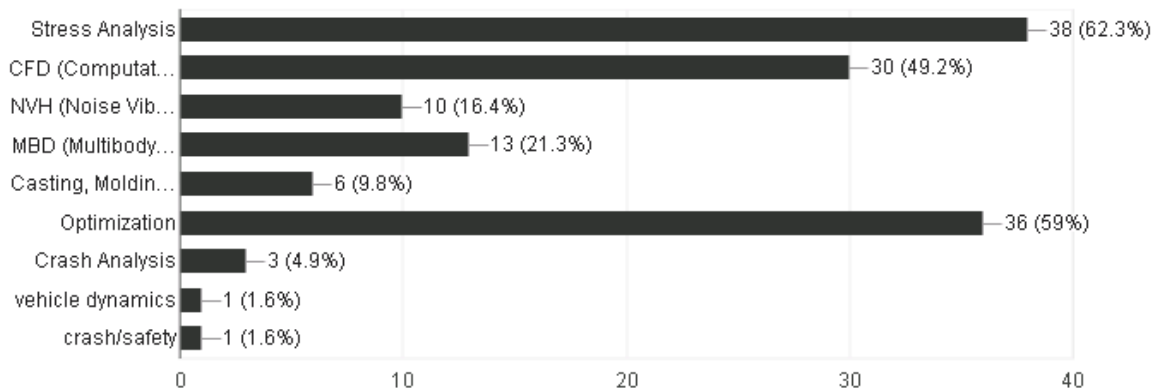
63 responses



Among those who used CAE applications, Stress analysis, Optimization, and CFD represent the three main categories.

If yes, please select all the categories that apply.

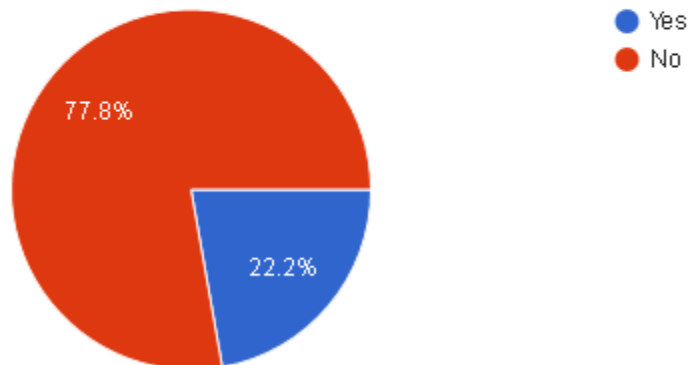
61 responses



77.8% of the users declared that they had not used cloud solution for simulation purpose. This question allowed dividing the participants into two groups. 49 had answered the questions of the section two (potential cloud adopters) and the other 14 the questions of the section three (cloud adopters).

Have you ever adopted a cloud solution for simulation purposes?

63 responses



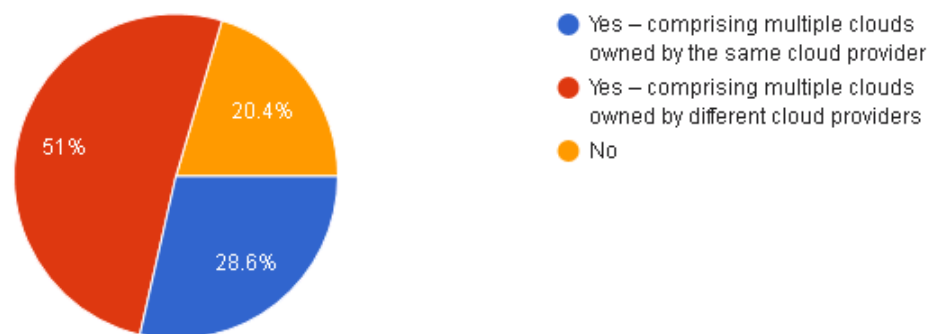
Potential cloud adopters

We have asked to non-users their opinion about cloud services to understand the area of interest in order to create the relevant cloud services. The 51% of the users accepts clouds owned by different cloud provider, while the 28.6% considered the possibility to use clouds owned by the same provider.

Only the 20% of the respondents did not consider the possibility to use cloud services.

Do you consider the possibility of using distributed cloud services (i.e., cloud services that are shared among multiple systems and which may also be in different locations) ?

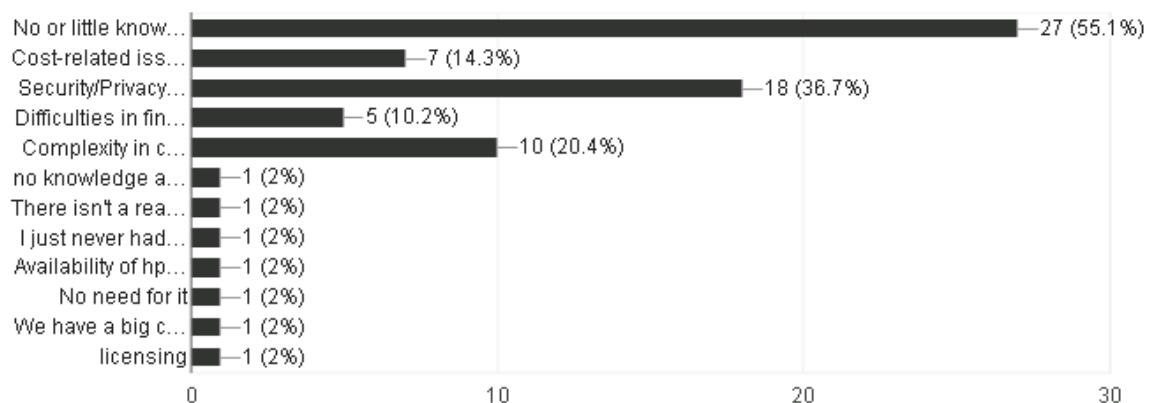
49 responses



Security, lack of knowledge of the cloud world, complexity in configuration and usage, cost related issues and difficulties in finding the correct hardware to run own applications are the main reasons why the respondents did not adopt cloud solutions so far.

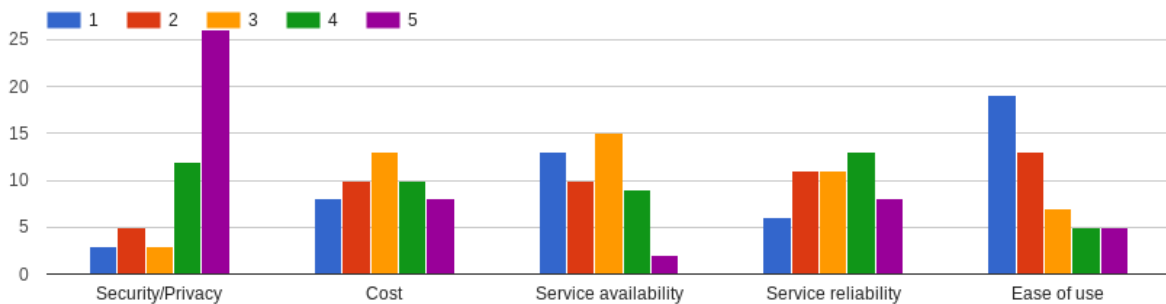
Which are the main reasons you haven't ever used cloud computing (or do not want to use it)?

49 responses



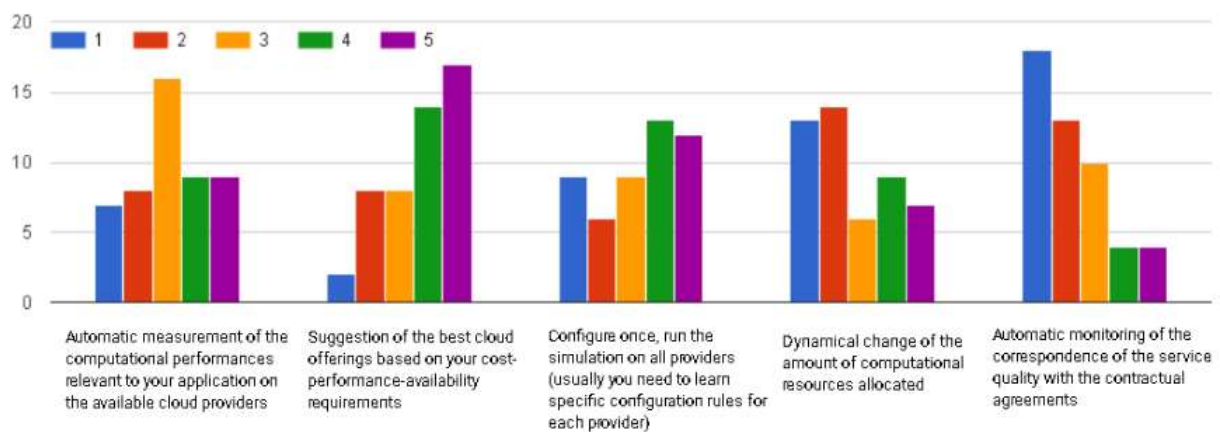
Security and Privacy are considered key points to convince the non-users to use cloud services. Cost and reliability are considered equally important, while ease of use and service availability are the less important perceived aspects.

According to your opinion, please rank the importance of the following aspects related to cloud computing (1: less important , 5: most important).



The following chart underlines how the potential users rank first the possibility of suggestion of the best cloud offerings based on cost-performance-availability requirements. An automatic measurements of the computational performance linked on the own application is seen as a plus but non fundamental for a future use of cloud systems, as for the possibility to configure once the simulation. Finally are considered less important, the automatic monitoring of the service quality and the possibility of dynamic change of the amount of computational resources.

Please rank, according to your opinion, the importance of the following cloud tools/utilities (1: less important, 5: most important).



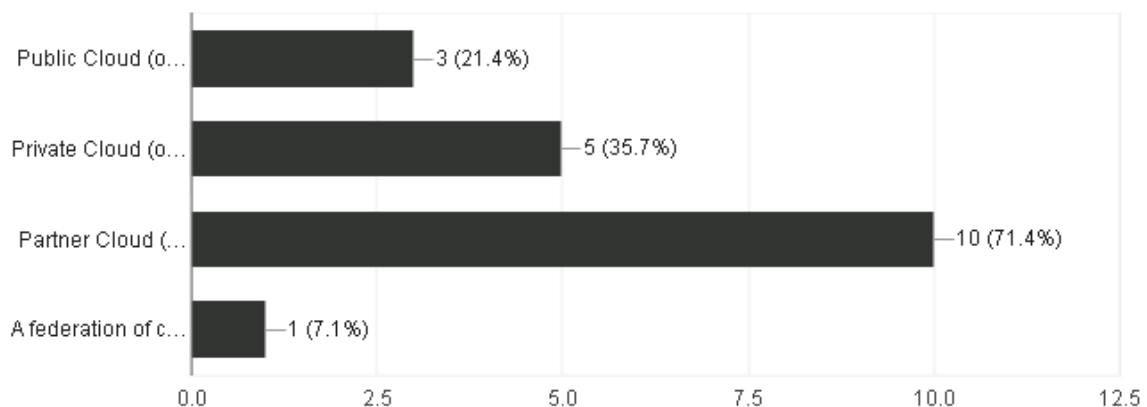
Cloud adopters

The cloud adopter's section of the survey had collected 14 responses because of the small number of interviewed who used cloud solutions before.

The majority of the cloud adopters use Partner cloud (owned and managed by a trusted partner).

Which solution(s) have you adopted as cloud adopter, in terms of the following Cloud Computing taxonomy?

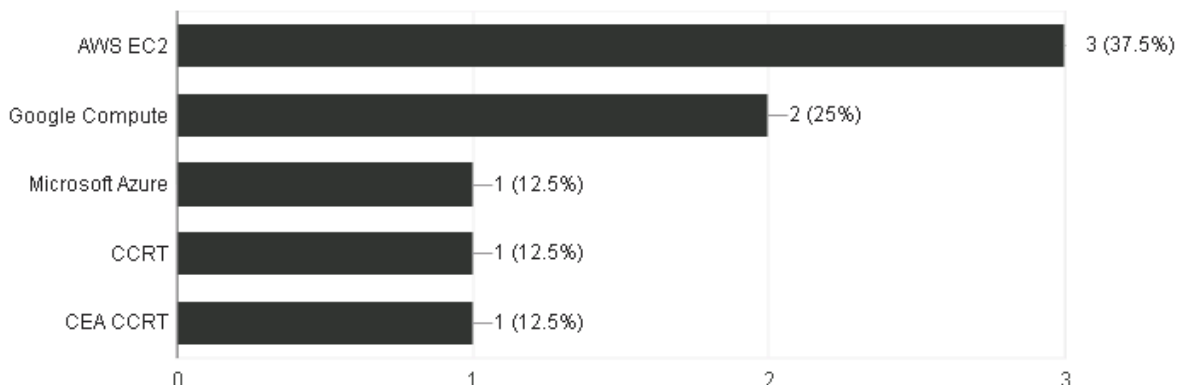
14 responses



Amazon Web Service and Google Compute Engine are the most used public cloud services for cloud computing.

Please indicate which of the following existing public cloud services and providers you have used, if any.

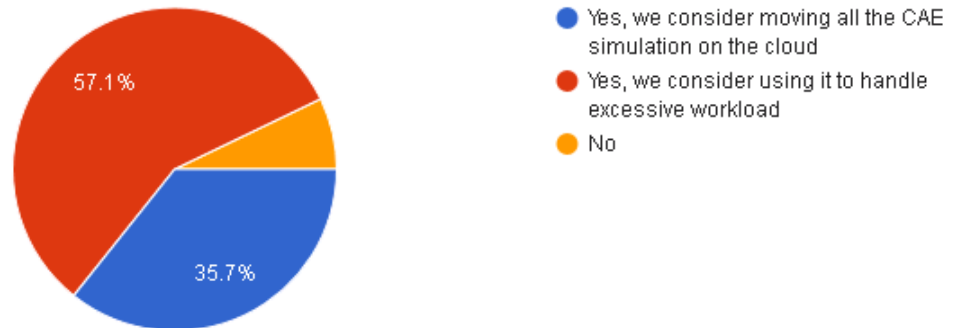
8 responses



The adopter's majority is planning to use cloud services again in the future, in particular to handle excessive workloads.

Do you plan to use cloud services for CAE again in the future?

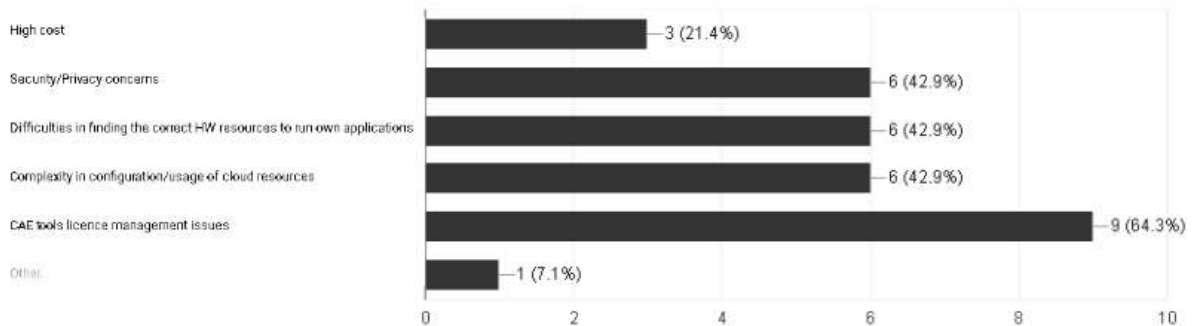
14 responses



The CAE tools license management issues are the primary drawbacks detected by the adopters, as well as the main problems (security/privacy, complexity in configuration and usage, difficulties in finding the correct hardware to run own applications) that actually discourage the use of cloud services like a main platform for doing the job. The cost does not appear to be an issue for the adopters.

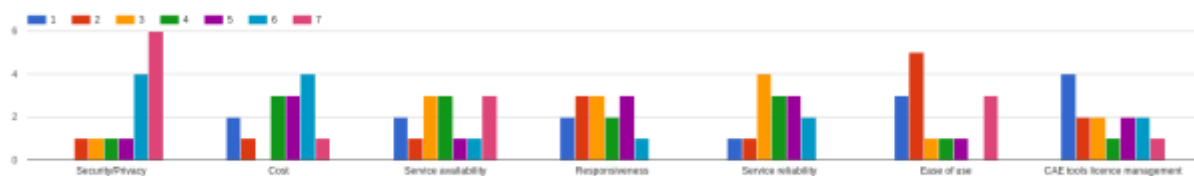
Which are the main drawbacks you have experienced using cloud computing?

14 responses



In terms of importance, once again security is by far the most relevant aspect. Cost is the second most important one, while all the others are considered equally.

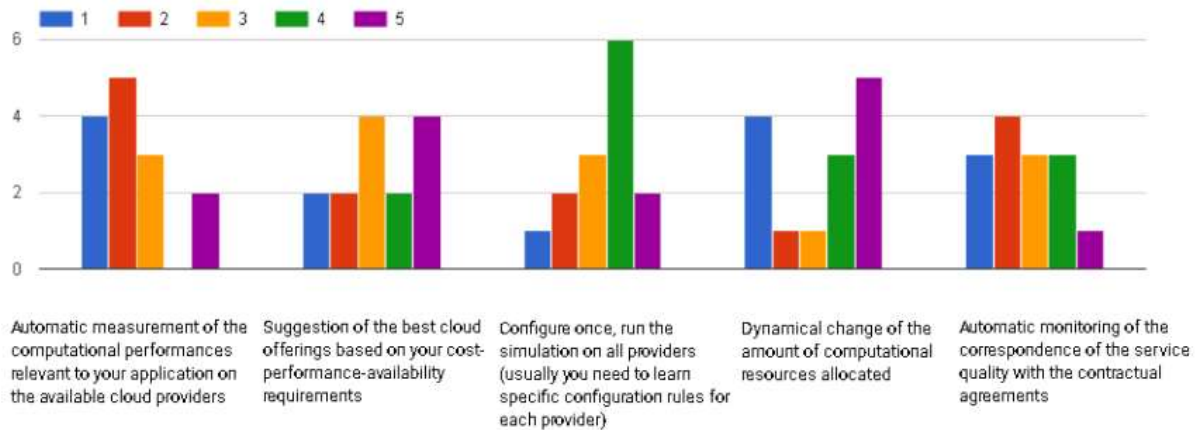
According to your experience, please rank the importance of the following aspects related to cloud computing (1: less important, 7: most important).



In terms of desired utilities, cloud adopters are mostly interested in tools capable to suggest the best cloud offerings, configure once for different platforms and dynamically change the allocated

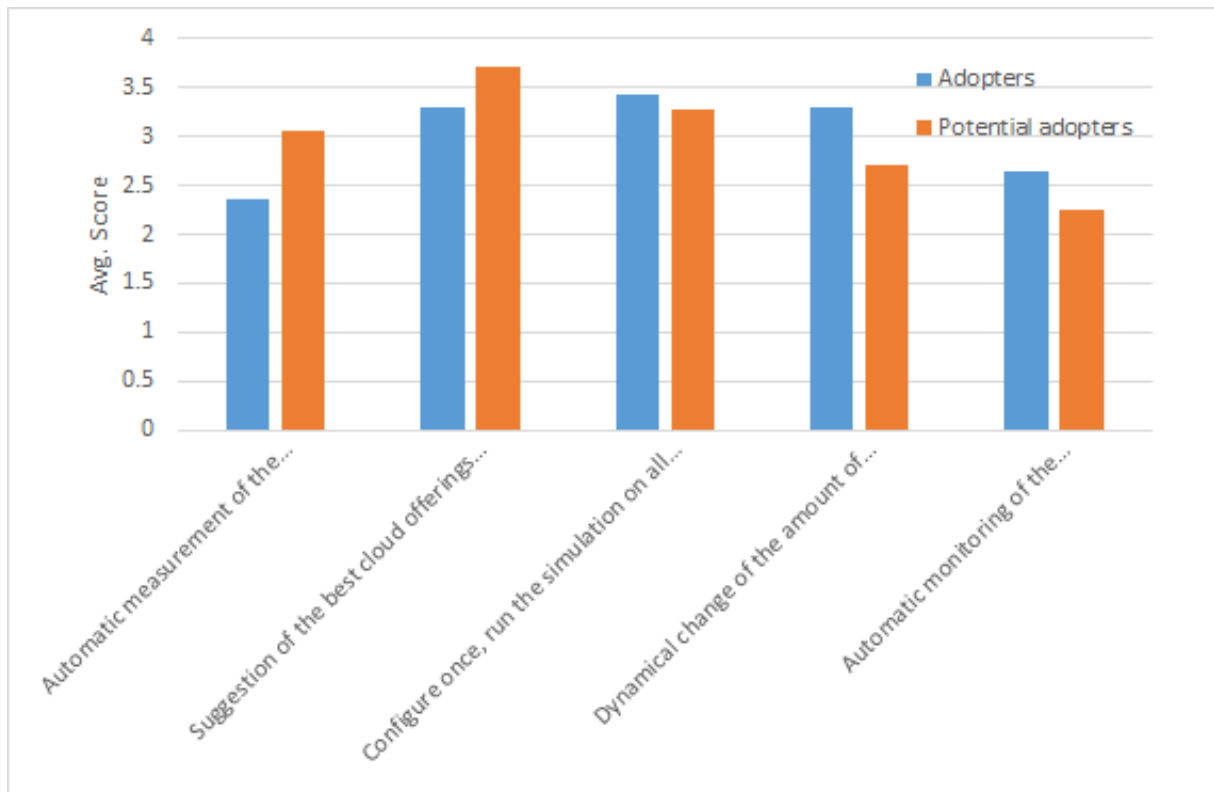
resources. The automatic measurement of the computational performances and the SLA monitoring are considered less important.

Please rank, according to your opinion, the importance of the following cloud tools/utilities (1: less important, 5: most important).



It is interesting to notice how cloud adopters and potential adopters have aligned opinions about the criticalities while they have different ideas about the useful tools needed to run CAE simulation on cloud.

Security and Privacy is the common most important issue (for adopters) and concern (for potential adopters), followed by the complexity in configuration and running of cloud system. Despite that, none of the two groups considered the ease of use one the most relevant aspects. Both groups don't consider cost as a big issue.



Software license management is considered as a big issue for adopters, while only one of the potential users considered it as a foreseeable problem.

The scenario in terms of useful tools is different and the two groups consider differently desirable functionalities: adopters, in opposite to potential ones, give much more importance to dynamical change in allocated resources and SLA monitoring, as visible in the above graph.

On the other hand, potential adopters give more importance to tools related to the choice of the right cloud system in relation to their application.

This difference is probably due to the fact that the majority of the respondents belonging to the adopters group make use of Partner cloud solutions, as highlighted by the survey, making the cloud choice less important.

Conclusions

Scope of this survey was the understanding, in the framework of the research project Cloudperfect, of customers' perception and needs about cloud systems applied to CAE simulations.

The objective was twofold: a better insight of cloud system perception is necessary both to improve the market and dissemination strategies and to focus the future development of the Cloudperfect platform.

From a pool of 63 respondents, belonging principally to heavy industry (but also consultancy, software development and universities) of small-to-large size, only 22.2% of the interviewed adopted cloud solutions for CAE simulation.

Among those who never used cloud, almost 80% is considering the possibility to use cloud systems in the future; the main reasons they didn't use before is, for most of them, related to the lack of knowledge, followed by security concerns, complexity in the setup of the system and the cost.

The most important aspect of a cloud system for potential users is security and privacy of their data (as easily understandable, looking at the target group). Then the service has to be reliable and the cost has to be low. The aspects that are considered less relevant are the availability of the service and, surprisingly, the ease of use (the main reason cloud is not used appears to be the lack of knowledge).

The most interesting Cloudperfect toolkits for potential users are those related to the correct choice of the best cloud solution for their applications and the possibility to have a multi-platform compatibility.

On the other hand, those who already used cloud for simulation purposes relied mainly on partner cloud solution or, in case of public cloud services, only on Amazon or Google solutions. More than 90% of the users are satisfied by their cloud experience and are planning to benefit from cloud platforms again.

The feedback obtained by the cloud adopters in terms of encountered drawbacks shows how the major problems are related to license management, complexity in configuration and in finding the correct hardware and, once again, security and privacy concerns.

The Cloudperfect toolkits that could be useful for the adopters are mainly the possibility to configure once for multiple platforms, the suggestion of the best cloud resources and, the possibility to change dynamically the allocated resources for the application.

In summary, the survey highlighted how the cloud technology is an interesting option for CAE engineers, even if today it is only used by few adopters. The major concern is, for the entire respondent group, the privacy of the data, while the major obstacles to a broader diffusion of these systems are the complexity in configuration and usage and the difficulties in the choice of the right cloud resource, problems that are greatly alleviated by the Cloudperfect toolkit.

Nevertheless, few aspects could be further investigated and improved in the framework of Cloudperfect: the license management and the dynamical change of the allocated resources.