

## **Using Project Management techniques, design, plan and justify the adoption of a Cloud-based IT infrastructure in a large organisation, in light of the uncertainty created around the Brexit vote.**

### **Description of Organisation University Leading School**

Here at Cloud Launch, we are a team of business analysts and programmers, that specialise in introducing cloud based infrastructure to small and large organisations, by looking at the way the organisation currently runs, and weighing up the potential advantages and disadvantages of introducing the cloud for a particular organisation.

We have been approached by UCS, a leading based business school in Stratford, London. Dean has contacting us in hope of the implementation of the cloud based system to help meet the schools ambitious targets in teaching quality, as well as research. She hopes to achieve this by ensuring these two tasks are carried out in a more effective way. A secondary goal for the school, through the adoption of the cloud is to increase the number of foreign students, particularly from the EU that attend the school.

### **Organisational Background and Assumptions**

The school currently provides qualifications at all further education levels, including UG, PG, MBA and PhD. The school currently administrates a variety of courses, all formed around business. There are assumptions that we will make about the school, when introducing the cloud to the organisation. The first assumption is that the school has a working website up and running, which includes student, teacher and management accounts. However it is assumed the website is off poor quality, and students are not able to easy share and use resources from it. Next we will assume that the school has their own databases and servers which will be used when we transfer onto the cloud, needing high speed internet to make the transfer to cloud as quick as possible, and prevent any downtime for students and staff. Finally we assume that there is an IT department, that will be willing ti retain, to prevent the loss of any jobs from the school.

### **Why Cloud Adoption is Necessary**

Currently, 76% of universities already use cloud computing within their organisation (Sharp 2018). This shows how prominent cloud technology is within this industry already and why UCS should be no different. Currently at the university lecturers are not recorded, which can have implications for students that miss lecturers due to illness or other reason as they will not be able to rewatch the lectures to catch up. Cloud computing will also be an effective cost solution for the organisation, as it reduces the amount of hardware needed so there are less one of costs in terms of buying servers. Next the maintenance costs will be lower, as possibility of hardware going wrong for the organisation itself has been eliminated. Finally the cost of renting servers and going on the cloud, means that you will only be paying for what the organisation is using. If the school needs extra space it can purchase more, but it wont be purchasing storage that it doesn't actually need. Another factor making cloud adoption necessary for the school is that as previously mentioned, Dean hopes to increase the amount of foreign students. Currently foreign students cant easily access work from home, and so for this reason are less likely to attend the university. However if a cloud system is introduced, it will make remote access much easier for students and help the school appeal to EU students. Furthermore, students dolt currently have a platform that they can easily collaborate work on, for the likes of group coursework and projects. This ties into one of the last reasons why cloud adoption is necessary for this organisation, which is that information can be easily lost, including work and resources, where as the cloud will be able to prevent this from happening.

## Work Breakdown Structure

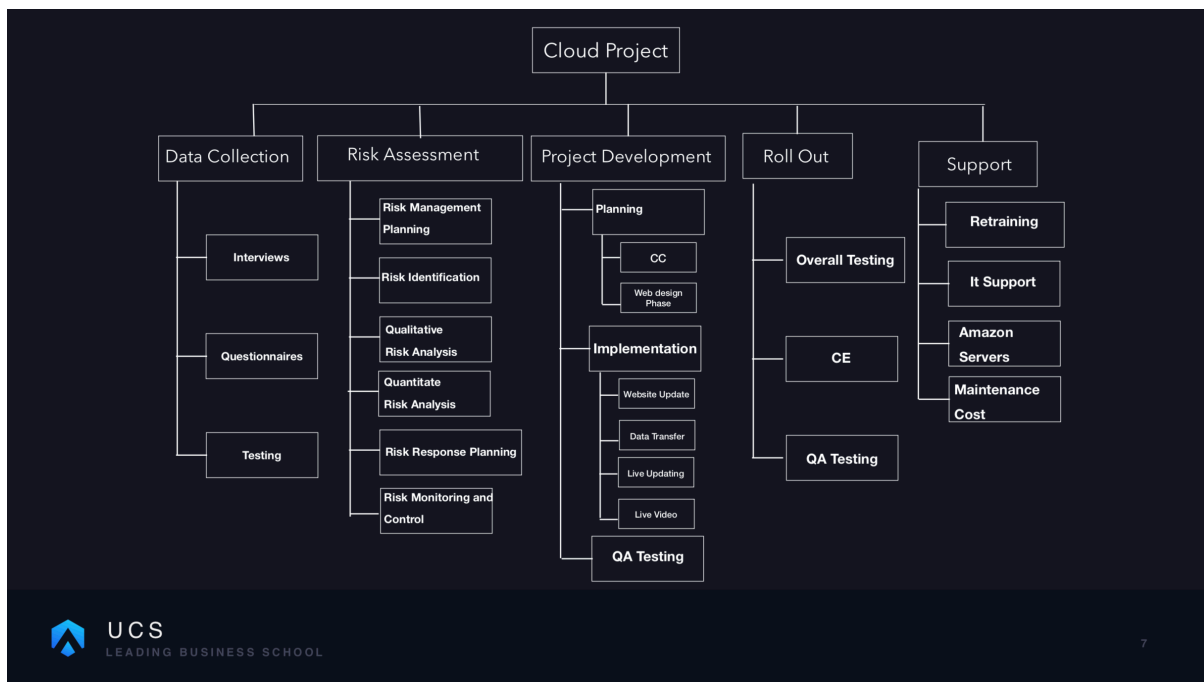


Figure 1. Work Breakdown Structure

Figure 1, shows the work breakdown structure that we will be filing for this project, which consists of 5 main stages. These are data collection, risk assessment, project development, roll out and support.

### Data Collection

Data collection is the first step that we will carry out, to gather as much information as possible about the organisation and to ensure that we have all the data needed to carry out the project. The 3 main techniques we will be using to gather this data are interviews, questionnaires and testing. This allows us to outline what the organisation is aiming to achieve from introduction of the cloud, as well as allowing us to see other potential benefits that the organisation may not be aware of.

### Risk Assessment

Once the data collection has been carried out, before we begin any sort of development and design, we must outline any potential risks of the project, and go about making sure they are eradicated or minimised. The steps we will follow to ensure that all risk are minimised or prevented are first risk management planning where we plan out how we are going to carry our risk assessment out. Then we will identify any potential risks of the project, and the analyse the risks qualitatively and quantitatively. The next stage is to plan out how we will respond to any risk that we have identified if they are to happen. The final stage is to monitor and control all risks throughout the project and stay on top of them as best as possible.

### Project Development

The third stage of our WBS, is the project development, where the project will be brought to life. First of all the overall project will be planned how we intend to carry it out through a design phase. Once this has been completed we will then begin implementation. This will

involve updated the schools website, transferring data from school servers to the cloud servers and introducing live updates and live videos. Once we believe implementation has been met, we will carry out quality assurance testing, to make sure the project has been completed to the highest standee possible and there are no improvements to be made, and no features have been missed.

## Roll Out

Once the quality assurance has been carried out to a high standard, we will then begin the overall testing of the system. This will require testers going overall all aspect of the system, following a set procedure and making sure each part of the system acts in a way that it is expected to. This stage is vital to ensure that when we roll out the system, it can begin ti immediately act how it is meant to and be used by the school and students, with minimised downtime. Once this testing has taken place the system can be introduced


## Support

Once the project has been rolled out, the final stage of our WBS is support. First of all, current IT staff at the organisation must be retrained around the new system, to be able to provide support and help showing students around the new website and cloud infrastructure. The school we also be required to start paying maintenance costs, covering the price of renting the servers from Amazon who will be there provider of their cloud servers.

## Estimation of the Project

In this section there will be an analysis of the cost and time estimation necessary for the project we are outlining for this school. The assumptions we have gathered from the school and the information we have gathered in earlier stages we have to the conclusion that these solutions are going to be solved. We therefore created an estimation of the necessary labour hours, average wage per section, number of employees needed, and the total cost of each part.

Software Function	Software Activities	Estimates of Labour Hours	Cost of About Hours Per Person	Number of Employees Needed	Total Cost	Work Share
CC:		40 Hours	£19.68	2.00	£1574.40	4.35%
Planning:		40 Hours	£19.68	2.00	£1574.40	4.35%
Web Design Phase:		140 Hours	£19.68	2.00	£5,510.40	15.22%
Updating Website to Communicate with Cloud	Website Programming	140 Hours	£10.11	4.00	£5,661.60	15.22%
Transfer Database to Cloud	Data Transfer	40 Hours	£30.00	2.00	£2,400.00	4.35%
Live Updating of Documents and Data:	Web Server Programming	40 Hours	£40.00	5.00	£8,000.00	4.35%
Live Videos For Classes / Talks:	Web / Server Programming	240 Hours	£40.00	5.00	£48,000	26.09%
Overall Testing:	Website Testing	80 Hours	£10.17	2.00	£1,627.20	8.70%
Launch Phase:		40 Hours	£19.68	2.00	£1,574.40	4.35%
CE:		120 Hours	£19.68	2.00	£4,723.20	13.04%
Total:		920 Hours	£228.68	28.00	£80,645.60	100%


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Figure 1. Financial Estimation of Project

In the figure 1, you can see the full outline of the estimations. As there is no simple answer to how long and how much it would take to implement our project ideas. There has been significant secondary research to find the average cost in time and money for every single function of our project. The largest cost of our project is the implementation of live video. From the observation Periscope, a live video website, we have found the average working hours needed and the amount of programmers needed (Cleveroad, 2018). We have also found that on average large websites take 4-6 months to develop(Liftinteractivecom, 2018). Through these analysis we have found that our project fits within this analysis and our project should take about 6 months. Through the observation of other project we were all to collect data on other part of the project. We have also used PayScale to find the average salary for the necessary position. Through this system were were able to estimate every part of the project and the cost of them.

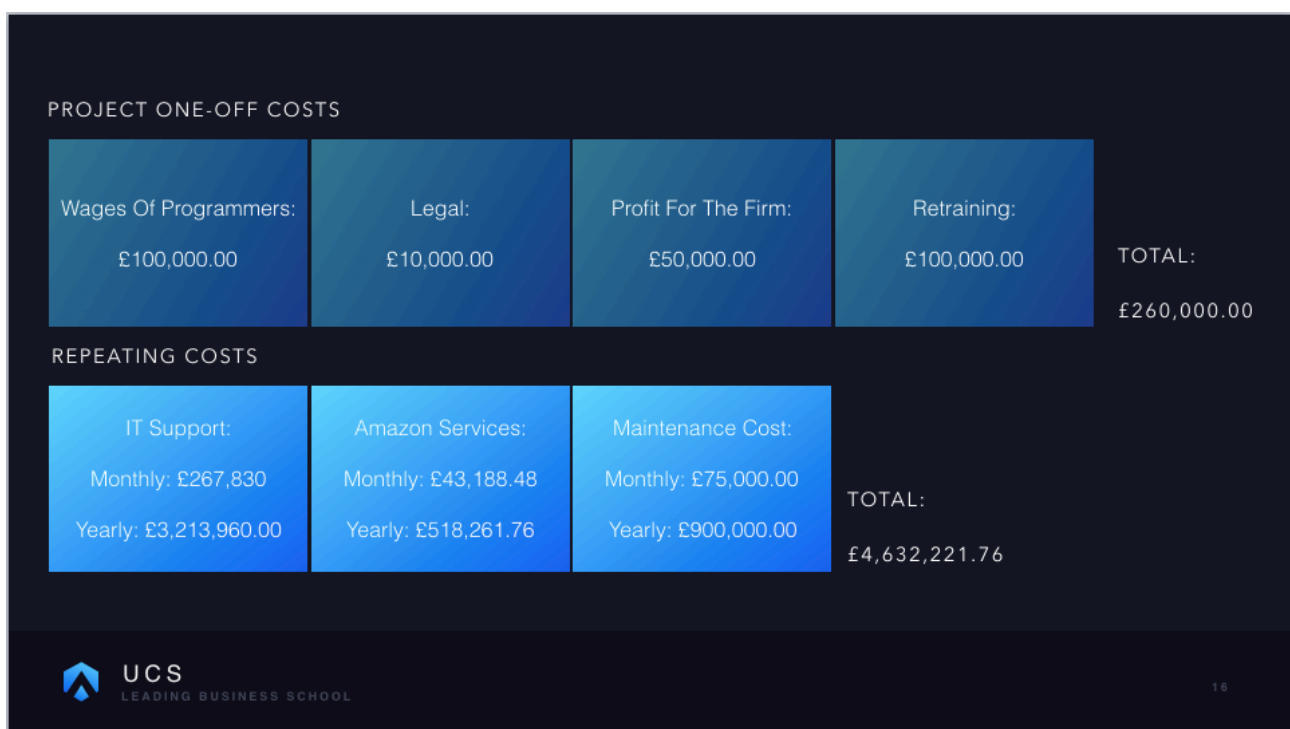


Figure 2. Project One-Off and Repeating Costs

In Figure 2, there is a description of one-off costs the project should expect and the repeating costs. One of costs are the wages of employees that we have explained in Figure 1, we have also estimated that there shall be legal costs to ensure that the project is done correctly. Mostly there shall be a retraining cost by founding that the school has a staff members that would require an understanding of how this website work. Therefore we have estimated that about a hundred thousand pounds would be necessary to do a full retraining of the staff(Blakely-Gray, 2018). The repeating costs are also the cost we already the expect for the school to have. IT support and maintain requires IT specialist and programmers to ensure that the websites works well and errors can be updated. We have done this by finding out the average salary for both by looking at PayScale. Amazon's largest server costs around 43,000 pounds per month to operate. The actual cost would be dependent on the amount of data that need to be saved at servers.

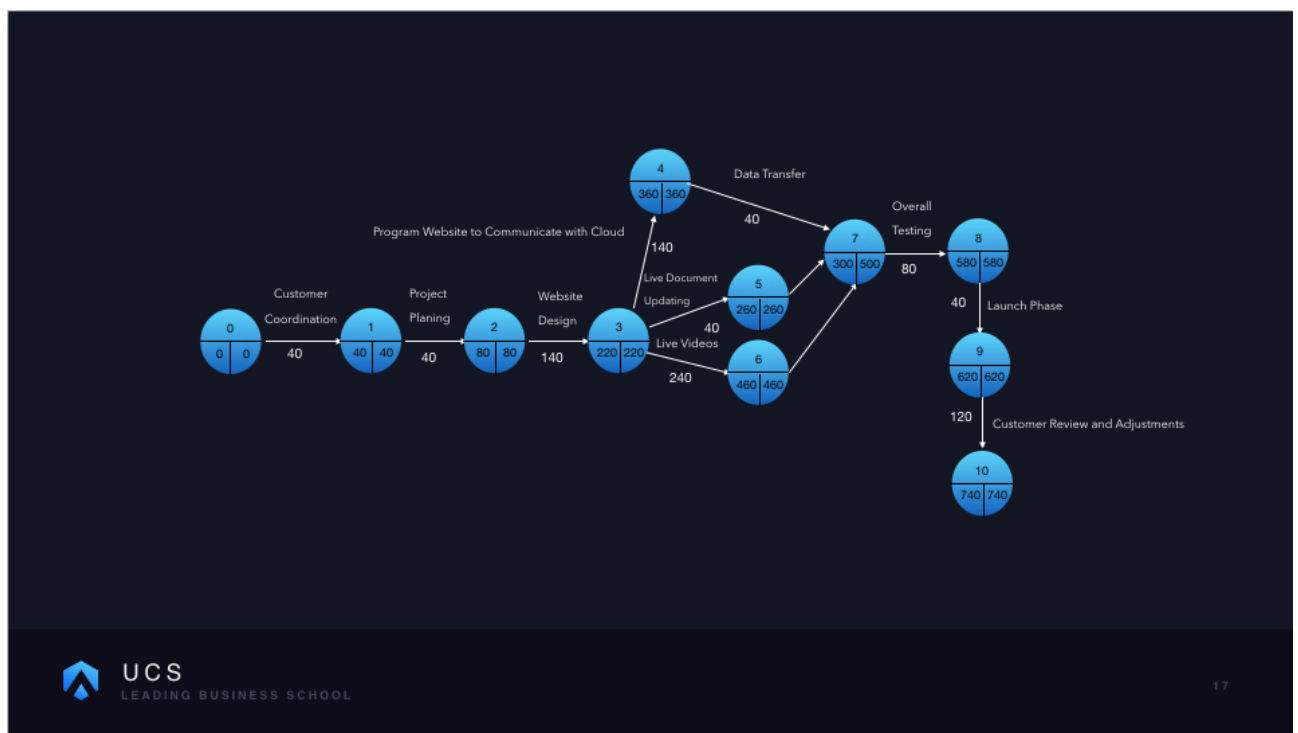


Figure 3, Time Frame of Project

In Figure 3, we have a visual representation of the timeline for the project. This figure shows how the project will run through the timeline as well as what part of the project have to be completed before we can continue to the next. This also allows the project to show how the project will run and why we need each section to be completed before the next. For example, website design is a prerequisite for starting program website, live documents, and live videos. Also these three are shown as able to run simultaneously. This is because they can be done at the same time. However before we can continue all these have to be finished before overall testing has to be completed. Lastly the project finished in customer review and adjustments.

## **Risk Assessment Evaluation**

UCS, as an educational institution, holds a significant amount of sensitive data, containing the personal details of students and staff, including research and teaching materials. The risk assessment is very important in the case of a cloud server system, as the way the data is stored, accessed and managed will directly affect the success in the implementation of the project. It is significantly important to analyse the key risks that UCS may face by adopting the cloud and whether they are justified.

To start with, one of the key and significant risks that UCS faces - is the upcoming process of Brexit. Whilst the United Kingdom remains a part of the European Union, UCS has to follow strict Data Management Guidelines regulated by the EU. However, there will be an inevitable complication of the various policies caused by Brexit, which will result in the UCS having to adjust their procedures in order to supervise the institutional data in the future. Therefore, UCS will need the support guidelines from the government to be able to determine the changing pattern of the requirements for hosting and transferring data after Brexit, which is still impossible to determine due to the complete absence of relevant information.

To continue, since May 2018, UCS as an organisation that hosts and stores data of its students and staff has to oblige to European General Data Protection Regulation also known as GDPR that ensures the protection of data and privacy of the users. However, it is still unknown whether this mechanism will be used in the UK and how will the safety of the customers' data will be insured, specifically in the cases when the cloud host is located in Europe and the client is located in the UK. On the other hand, it is a minor risk for UCS as there are Amazon cloud servers that are located on the territory of the United Kingdom, therefore there is no need to overcomplicate the legal process by using a server located in the mainland Europe. Though, it is still the UK's government responsibility to ensure the development of the regulations regarding the movement, storage and the provision of data and assist the organisations like UCS in adopting these rules in the future if there is any change.

Moreover, Brexit has already resulted in the financial complications for the organisations that adopt a Cloud-based server strategy. Due to the decrease in the value of Sterling, the prices of renting a cloud storage have seen a minor but steady rise, especially if billed in foreign currencies such as Euros or Dollars. On the other hand, this is a relatively short-term issue as the value of British Pound is likely to rise when the current political tension and uncertainty is resolved. Still, the trend of rising prices of renting a cloud storage is likely to continue for a completely different reason. Major technological cloud providers such as Microsoft and Amazon have announced that they will continuously adjust the renting price for their cloud servers that are billed in Pounds to balance it with other currencies. Furthermore, there is a slow but steady general increase in the price of renting a cloud storage. The overall prices have increased by 12% since the Brexit vote and are predicted to rise even more which will mean a continuous IT budget updates for UCS.

Last but not the least, Brexit is a big but not the only risk in the cloud adoption strategy, one of the key risks is the nature of the cloud itself. By switching to the cloud storage, UCS will inevitably reduce the visibility and the control over its operations and assets, depending on the policies of the provider, which can be subject to an agreement. This is a very important matter as UCS cannot allow the third parties to access any sort of data of the institution as the majority of it is very sensitive and should be accessed only if UCS is aware of it. As a result, this will cause the implications to the use, access, and authorisation of data by both - the client and the host. This will complicate the process of signing the contract with the provider but it is a risk that UCS and Amazon will be able to resolve if they reach an agreement. Finally, the cloud provider does not guarantee the absolute security of the data if the server is breached. Despite the high levels of encryption and the continuous improvement of the security protocols, the breaches may still occur. This creates a greater threat for the data that UCS host, however, cloud storages of Amazon are believed to be far more secure than local servers of UCS making this risk a minor one.

To sum up everything above mentioned, the real risks and consequences of Brexit on the cloud adoption remain unknown and can only be assessed theoretically. It is hard to estimate the impact on both companies and the clients due to the inability to determine which one of three Brexit options will happen - soft, hard or no Brexit deal, especially with the current uncertainty within the British government. Only after knowing one of the outcomes it will be possible to begin to determine the future changing pattern and deal with the risks they may possess accordingly but not now. Whereas outsourcing the data to the third party will complicate the procedures of managing the data in the short run, it will still

give UCS more possibilities to manage and store their data more effectively in the future with almost unlimited possibilities to expand.

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## **Client requirements translated into Requirements Specification**

### **Introduction**

As soon as our company received the request form the dean of the University Collage of Stratford (UCS), the business analyst team immediately start adopting techniques in order to get customer's requirements and translate them into technical ones. Doing so our developers would be able to have a clear idea of what it needs to be created and start the actual development of the cloud-based application. Have clear requirements would make possible to create a tailored service for our client reducing errors.

### **Technique used**

The first technique adopted is a face-to-face interview with the Dean of UCS, responsible for the creation of this new project. Having this opportunity means to have a detailed conversation with the project leader in which he can clearly express his requirements and receive a direct feedback from us, reducing misunderstandings and decreasing the time of communication. At the same time, our team could express to the client ideas that could be useful, creating together the best possible framework of the project. During this interview the main problem stood out comes from the lectures which are not recorded. As the main objective of the project is to increase foreign students the team will adopt solutions in order to allow students abroad to follow the lectures even if are not present in the country. This would lead to a greater satisfaction and motivation in studying abroad.

The second step in gathering requirements is a questionnaire address to students and lecturer. End-users are normally considered the best source in order to understand product functionalities and services needed. The questionnaire is divided in two section, the first give the possibility to freely express users ideas and suggestions, the second part is aimed to collect feedback with specific questions regarding ideas the team has in mind. The problem most of the students emphasise is that communication methods with the lecturer are not sufficient, at the moment the only way to contact them is via email or face-to-face meeting. Being a foreign student include going back home periodically, during these periods students have to be able to organise meetings and to have a direct conversation with their lecturer online. This would also lead to a massive save of time for commuter students, who won't need any more to be in campus to organise appointment.

The final step in the collection of the requirements is a test of the previous system from our team. Doing so technical problems not emerged in the previous steps can be analysed and resolved. The problem that here has been observed is that the website is not intuitive and does not offer the services that it could with a communication with the cloud. Sections and functionalities are not user-friendly and is poorly designed. Having a communication with

the cloud permit a up-to-date material in real time and a redesign of the website can improve the usability of it.

## **Solutions**

At the end of this three techniques the requirements can be clearly defined, offering a quality product to our client having a solid idea of which sectors will be affected by our system. Our solutions will be essential in order to attenuate barriers that Brexit will create in order to access education abroad, motivating foreign students in applying anyways after Brexit.

In this part of the report our solutions will be presented, however, only the three major changes that solve the problems mentioned before will be described in details. In general, our project mainly affects three big categories of the institutions: Studying, communication and usability. The main change that will affect studying is the possibility to have live stream lectures, students abroad and commuters can easily follow lectures even if they are not in campus. Another big change is that notes will be automatically saved in the university platform and each student will be able to access them with every device. Communication will be affected by online meetings and student's forum, in here students can receive feedback from others. Most of the time lecturers have hundreds of students and not enough time to reply to everyone. Usability will be improved by a website communication with the cloud, all the material from lectures, coursework and notes will automatically update and will be shared in every device. This permit to foreign students to access all the university material from abroad, without the needs of having the laptop with them.

## **Requirements specification**

In this part of the report the three major changes will be described in detail

Live stream lectures:

1 Users must be able to access live lectures in each modules' section.

1.1 Users must be able to stop the live stream

1.2 Users must be able to change volume

1.3 Users must be able to change size of the screen

1.4 The livestream will show the slides and the lecturer in two different parts

2 Recorded lectures are kept in the system.

3 Users must be able to download lectures.

4 Users must be able to keep track of lectures seen.

Online meetings:

1 User must be able to see the availability of lecturers

2 Users must be able to



## **References**

Sharp, J. (2018). *Cloud technology: the advantages and disadvantages for universities*. [online] Times Higher Education (THE). Available at: <https://www.timeshighereducation.com/blog/cloud-technology-advantages-and-disadvantages-universities> [Accessed 23 Nov. 2018].

Liftinteractivecom. 2018. Lift Interactive. [Online]. [22 November 2018]. Available from: <https://liftinteractive.com/blog/how-long-does-it-take-to-design-and-build-a-website/>

Cleveroad Inc. - Web & App development company. (2018). *What should you take into account for live broadcast app development?*. [online] Available at: <https://www.cleveroad.com/blog/how-much-does-it-cost-to-create-a-live-streaming-app-like-periscope> [Accessed 12 Dec. 2018].

Blakely-Gray, R. (2018). *What Is the Cost of Training Employees?*. [online] Payroll Tips, Training, and News. Available at: <https://www.patriotsoftware.com/payroll/training/blog/cost-training-employees-average/> [Accessed 12 Dec. 2018].