Written internship report

by

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at

ABGX

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Summary

Introduction

For 3 months now, I have had the pleasure to work as a web developer for ABGX, a management and radiation protection company oriented towards medical activities implying radioactivity. This internship was for me the occasion to learn new programming languages and how to work efficiently in a team. My work was mainly focused on one project, the solution developed by ABGX, which we will discuss later on.

In the first part I will talk about how a new employee can get his hands on the project, what he should know about it, about the company, about how work is organized and what he should do to continue it.

In the second part I will talk about my will to be part of a new project, what I can bring to this project with my recent experience.

PART I

ABGX

ABGX is a company created by Thomas Lamy in 2015 and based in Clermont-Ferrand to fulfill the role of a management solution, as there are plenty in other domains of activities, in a growing sector, radiation protection. The company is a young startup composed of one developer and one project manager with a growing need of employees to have the work done as the company develops its partnerships.

Nowadays ABGX is recognized as one of the main solutions dedicated to the management of radiation protection and healthcare establishments.

It equips different types of healthcare establishments, such as large French hospitals counting up to 2.000 workers exposed to radiation, medium-sized structures with a hundred workers and very small businesses

The company, originally focused on medical sector, is now expanding its domain of activities with partnerships involving industrial groups.

ABGX headquarters in Clermont-Ferrand

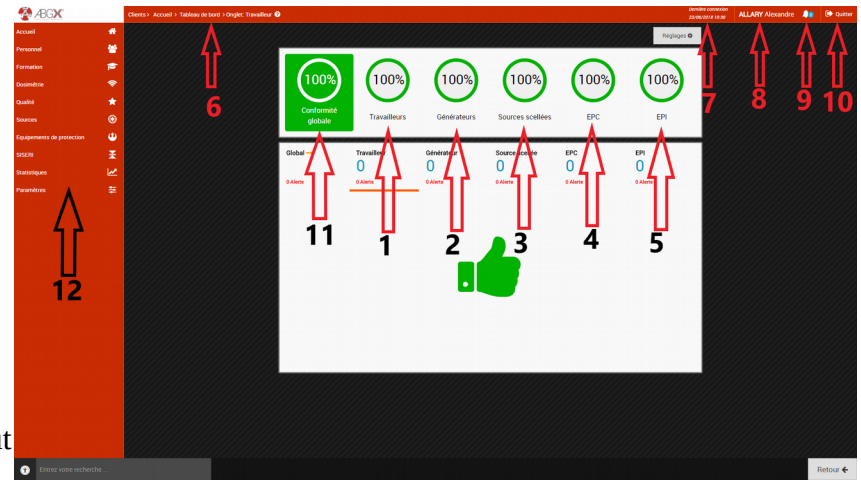
The project

As I said earlier, ABGX is developing a management solution for radioprotection. This solution consists of a website where managers, doctors, CRPP (Competent Radiological Protection Person) or human resource managers can directly organize ASN (Nuclear Safety Authority) inspections, medical examinations and so on.

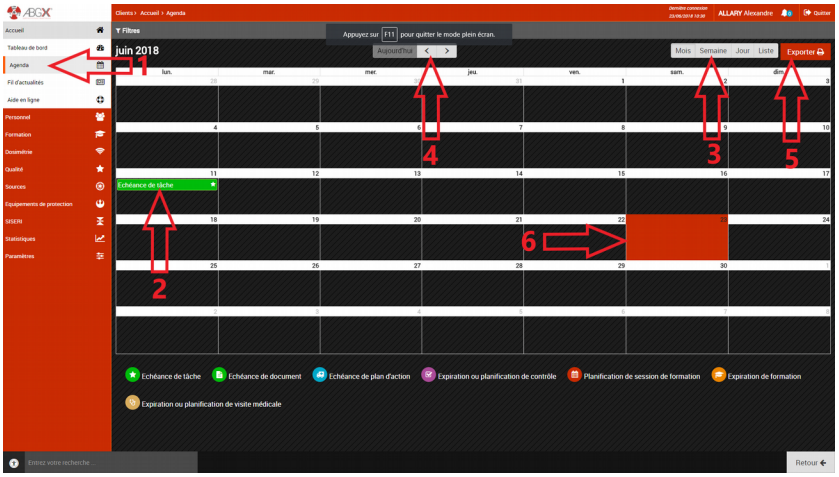
From now on I will introduce you to this website and how to navigate in it so you can be familiar with it before starting the development in itself.

First of all, the connection page, which is pretty classic, username and password required with a two-step verification requiring a code sent via e-mail.

Then you arrive on the dashboard page, where some graphics are displayed, their number depends on your establishement's preferences. There you can see your establishement's statistics concerning workers (1), radiation generators (2), radiation sealed sources (3), collective protection equipement (4), individual protection equipment (5) and a global statistic regrouping all of them, it's used to measure the establishement's global conformity (11). On top of the screen is a toolbar regrouping the path you followed to arrive on this page (6), date of your last connection (7), your name (8), your notifications (9) and a logout button (10). On the left you can see modules (12), on which you can click to access different parts of the website.

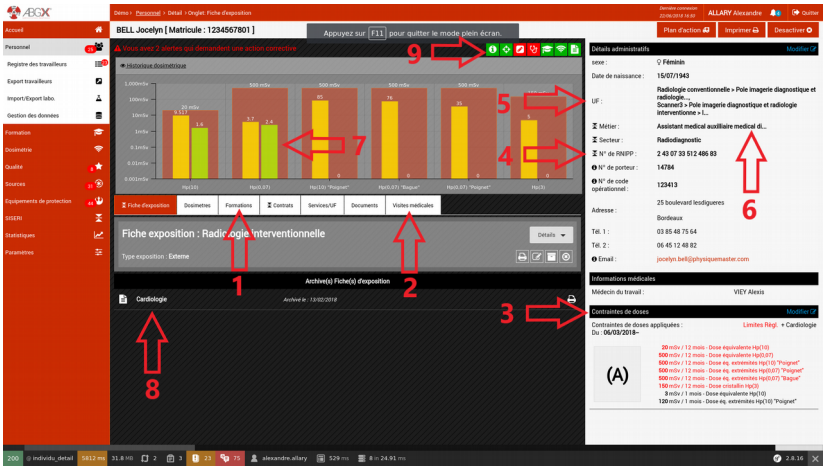


If you click on the “Accueil” panel on the left (1) you will see the agenda in form of a calendar, the agenda is where every expiration date or scheduled event is displayed, like medical examinations or tasks (2). In red on the calendar is today’s date (6), the calendar has multiple display modes, day, week, month or year (3), by default the display mode is set to month. You can switch from month to month by using the arrows in the middle (4), on the left of the arrows is the actual month and on the right of the display modes is the export button (5) used to generate a printable file. I did this module by myself so I will use it later to explain which languages are used, how the code is functioning and how the team is organized.



After that if you click on the “Personnel” panel on the left you will see multiple choices, by clicking on the “Registre des travailleurs” tab you will arrive on a page displaying all the workers of your current establishement, their names, job, and all the useful information about them. On the right, at the end of each line are the alerts concerning training sessions, medical examinations, radiation doses and so on. On the top is the filter bar, which is used to do more precise research among all the entities present in the database. By clicking on “+ Travailleur” you can add a worker to the database, this worker creation form requires several things such as a name, registration number, date and place of birth and every useful information about their career.

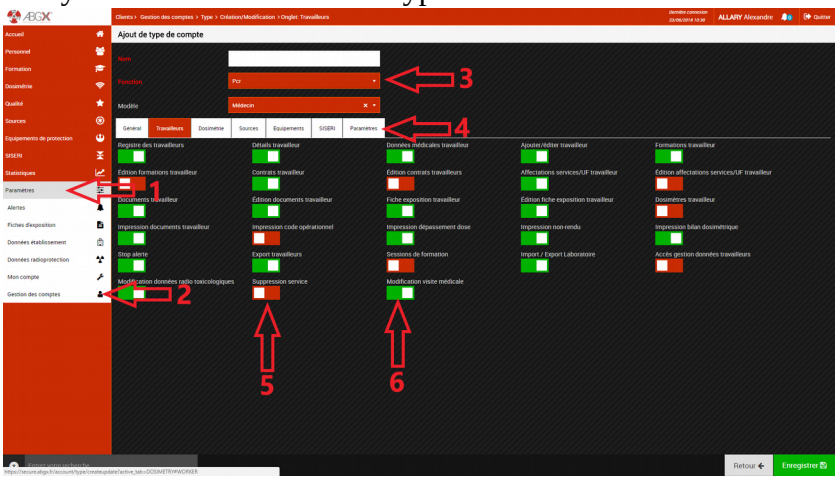
As they are the nerve center of the application I will detail the worker page. Clicking on a worker will open the details about him. In this detailed page you will see all that is required to have the worker at full conformity, for this his training sessions must be up to date (1), as well as his medical examinations (2), and he must not go over his doses constraints (3) fixed by their category in the medical activity (A or B), those categories are fixed by the law. Attached to the worker are the exposure sheet (8), papers recapitulating all the doses he took and all the dosimeters he used. You can also see the worker’s registration number (4), his pole affectation (5), his job (6)



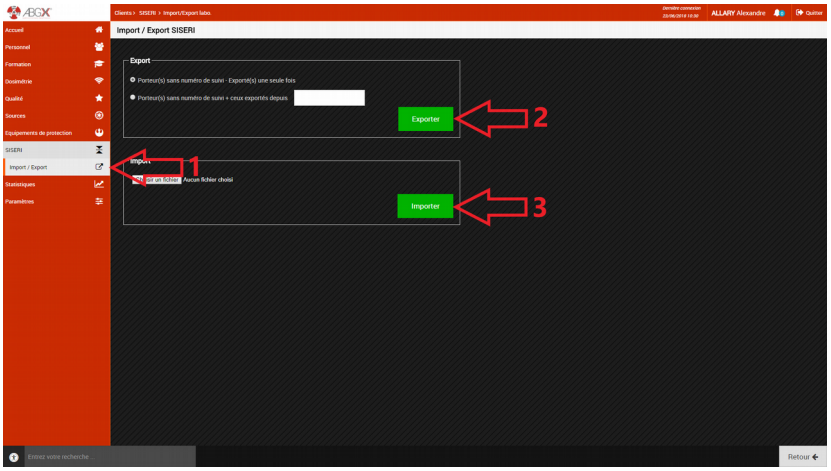
and some other informations. A graphic is displayed on this page showing the current worker last doses taken by different dosimeters (7). On top of the graphic you can see alerts (9), they are of differents colors, green when everything is ok, red when something is not present, and orange when something is expiring. Those alerts are for medical examinations, training sessions and everything that has to be up to date for the worker to be in full conformity.

Now that you have seen different pages with different features like alerts, filters, creation form or export I will show you some other technical pages and then I will talk about languages, work environnement and team organization.

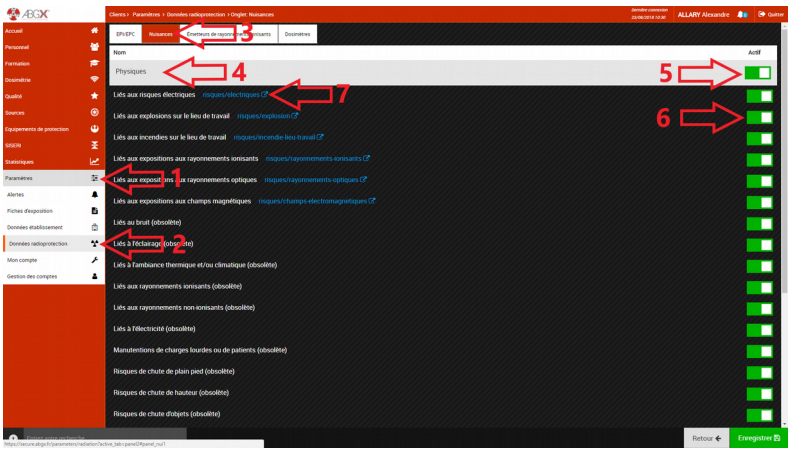
One of the most critical page of the website is located in “Gestion des comptes” (2) in the “Paramètres” panel (1), there you can see all of the establishement’s accounts, if you have the right to do so you can edit them and change their roles. In the top right-hand corner you can see “Ajout d’un type de compte”, by clicking on it you arrive on the account type creation form which is presented that way. On the top is the name of the account type, like doctor or CPR, the function to be chosen in a given list and a model which is also to be chosen in a given list with preselected roles (3). Then you have the role category (4) presented in different panels, they have the same name as the panels on the left, and they are used to access the roles that gives rights to modify or access different modules. If you wish to give a certain role you have to tick it, it will be red (5) or green (6) depending on wether you have selected it or not.



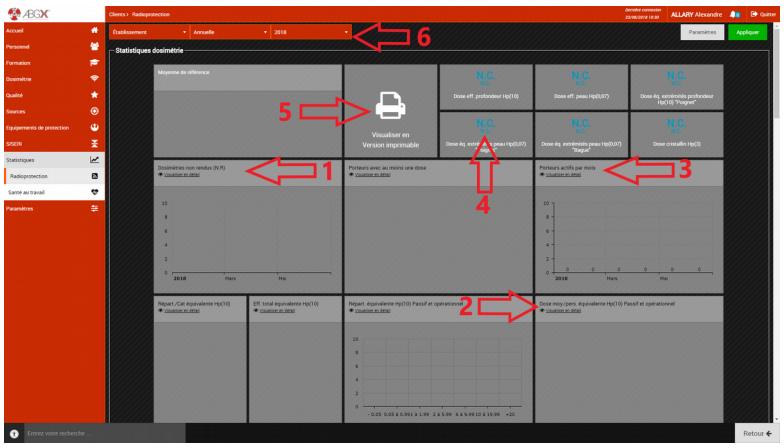
Another crucial feature is the ability to directly work with the SISERI information system database. SISERI is a database dedicated to centralise, verify and preserve all dosimetric data related to each worker exposed to ionising radiation. It was developed at the demand of the ministry of labour. In the SISERI panel (1) you have the ability to export a worker (2), that way you will upload all necessary information about him directly in the SISERI database which facilitates the procedure. Just below you have a button to import a worker (3), putting all its information in our database, facilitating another task.



ABGX also takes in charge risks prevention as it must be included in the exposure sheet for each worker. In order to do that, the official risks listing is implemented directly in the application in the "Paramètres" (1) panel then "Données radioprotection" tab (2) in the "Nuisances" panel (3). There you can see all risks categories (4) given directly by the INRS (Reference body for occupational risk prevention in France), all the categories can be turned off (5), it allows you to personalize which risks you want to make available in the exposure sheet of your workers. You can also turn off the risks one by one (6) if, for example, you have a risk due to a cold environment but not to a hot one. All risks have their own URL redirecting toward the official explanation page of INRS (7).



Also, the application has a module dedicated to statistics where you can access the statistics of your establishement, like dosimeters not given back (1), averages doses (2), active bearers per month (3) or doses per dosimeter (4). Those statistics are printable (5) and offers a way for establishements to follow month per month the evolution of their conformity. You can choose different displays like year or month view, you can also select the year to compare with previous ones (6).



Concerning evolution, the application offers a way to organize those changes in the way of a module which is used to create action plans. By creating an action plan, the establishement can anticipate future changes and assign tasks to others to do so the establishement can be in conformity for, as an example, an ASN inspection. The action plan has a due date, a list of tasks to be done, documents related to tasks or related to the plan itself and a progression bar. The goal of the action plan is to give a goal for all users so the establishement can be in a 100% conformity for inspections or have all its workers up to date concerning medical examinations or training sessions.

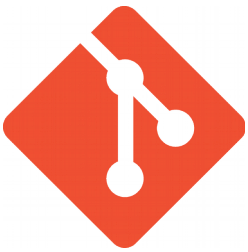
After this explanation of some of the core modules of the application I will now talk about technologies and work environment so you can be familiar with which languages and frameworks are used to develop the application.

Technologies

First of all you must know that the majority of the application is developed in PHP, a powerful language used to develop server-side code, HTML/CSS, two languages used to do front-end content, javascript, another server-side language used to do scripting inside web pages, and MySQL, an SQL derivative DBMS (Database Management System). All those languages are working together to produce a fast web application.

Before going into the languages details I will talk about organization and work environement.

Concerning work organization we use Redmine, a tool used to organize projects, it works with tickets to represents tasks to do to advance releases, a roadmap is provided to follow them. The tickets are written by either my mentor or the project manager, it's the devs tasks to do them and to advance the release. In this tool each ticket has an advancement status, from 0% to 100%, and each ticket 100% done advance the release advancement status, hoping to reach 100% by the 3rd tuesday of each month, when the release is delivered. If you have questions about a ticket you can ask directly to the person who created it.



Another tool used is Git, a free and open-source distributed version control system. In Git we have multiple branches, one called "develop" that is the main branch where every feature ready to be released is located, and other ones created by us for long-term tickets to be sure not to cause problems when pulling on the "develop" branch. We merge them on develop only when we are sure that the feature we are working on is fully ready. We use the git flow method, used for project management in git, as we have a master, a develop, a realease, hotfixes and features branches. Each branch is used for a specific case and should not be interverted with another one or merged together accidentally.

We also use Virtualbox for developing purposes, indeed we have a virtual machine turned on where we have the main Git branches in addition of the local ones on our machines. That way we have 2 versions of the develop branch and it's used as a security measure in case a test goes wrong. It's also used as a mean of deployement for the application. Each application and release is deployed directly for the client on his own machine.

As for the work environement we uses Atom, a graphical text editor, because we know it well but also because it allows us to have the same indentation. It also provides us, by the means of an add-on, with a way to directly send files to the distant branches on the virtual machine to have them directly taken into account by the application and, that way, permitting us to run tests easily.

For CSS and JavaScript files we use a tool called Grunt that automatically minifies them.

Now, for the languages, I will explain in details our use of PHP, JavaScript, HTML, CSS and MySQL.

First of all PHP, the main language we use. We are using Symfony 2.8, a PHP framework used to develop web applications, this means we are using PHP as an object-oriented programing language which allows us to create objects with attributes and methods.

Symfony requires the use of controllers to create pages, a controller is a PHP function that reads information from a “Request” object and creates and returns a new “Response” object. The Response can be either an HTML page, a Json file, an XML one, a redirect or anything you want to render the content of a page. In order to view the result of a controller you need to map a URL to it via a route, all routes are within the “routing.yml” file, and call the “renderResponse” method that renders an HTML template that you can modify, providing you created the HTML file first. In the HTML file you can then use any variables you send thanks to Twig. Symfony is also using a design pattern called MVC, for Model View Controller, that consists of a Model part that handles request and process data for the Controller. The latter will check those datas, modify them and decide what to send to the View, it also manages the roles required to access the datas. The View is the part that the user sees, it’s filled mostly with HTML.

Twig is a template engine used to execute PHP code inside HTML files without using the declaration “<?php” but instead using “{{}}“. Twig also allows you to generate predefined layouts to use if a lot of pages have the same formatting. We use it for printable documents and most of the pages.

Some of the modules requires, for the user to see them, a role. Every role is defined in the “security.yml” file, along with other security informations and is checked by the Controller.

Also, to use the database as object-oriented, we use an ORM (Object Relational Mapping) called Doctrine. This ORM allows you to execute MySQL queries inside your PHP code and to retrieve objects directly from it, it uses a specific syntax called DQL for Doctrine Query Language. Those queries are most of the time used inside methods declared in entities repositories. A repository is a class used to isolate queries made for a specific entity.

In coordination with PHP we use JavaScript to do scripting tasks inside HTML pages like researches, loading page or the agenda itself.

Since I have talked about it for a long time I will explain what HTML and CSS are. HTML (Hypertext Markup Language) is a front-end programing language used to render a web page, alongside CSS (Cascading Stylesheet), which is used to design HTML pages, they are powerful tools to display everything you like. For CSS we use SASS (Syntactically Awesome Style Sheets) that allows us to use variables in CSS files, those variables are replaces by their values once the CSS is processed. Every page in the application is made with HTML and CSS.

Now that I explained every language or tools we use for development I will explain with an example, the agenda I made myself.

The agenda is an HTML page with a JavaScript agenda displayed on it via a script.

First, when you click on the “Agenda” tab, you will call a URL defined in “routing.yml”, this URL will call a function defined inside the agenda controller. This function will then enter a loop to fetch every event in the month. This loop calls methods which are located inside other entities repositories, and those methods will use Doctrine queries to fetch object’s date. Those dates are then stored inside a json array where names, dates and other things are given, and assembled together inside a unique json array. This json is then sent to the JavaScript for treatment, there we use an add-on called FullCalendar that allows us to, with a json feed, create events with names and colors and display them on the page.

PART II

Dear President,

I am, via this document, applying to take in charge the new project we recently negociated. I think that, with my experience, I am a perfect candidate to work on it. Indeed I perfected my knowledge in different languages including PHP, JavaScript or HTML, and since this project is a website it can’t be more fitting. I assure you I will reveal myself to be a powerful asset for the team working on it.

In the past few months I sharpened my understanding of code and my autonomy. And I am well aware of the importance of this project, I will prove myself to be a project manager you can trust. I learned to work in a team and to organize tasks in a way that no one would be lost. I know I can apply my multitude of technical skills to improve the project and be a force of proposition to be reckoned with.

I think I can carry this team onward on the path to success and produce a quality result fit to be presented to investors.

As I showed lately I learn fast and I know how to find informations by myself. I do not stop at the first obstacle and always search for a way to improve already existant modules. This new project will be a great challenge and will allow the team and me to improve our coding skills and team management senses.

Thank you for your time.

Hoping to get results soon,

Best regards,

Alexandre Allary

Conclusion

To conclude I will say that this internship taught me a lot. I've learned languages I had never used before like JavaScript and I was surrounded by a comprehensive team that didn't leave me on my own right away. I wanted to thank my internship tutor, Julien Antony, for his time and for answering all my questions in a way I could understand, and ABGX president, Thomas Lamy, for accepting my internship demand. What I learned during this internship will for sure stay with me for a long time and will no doubt help me find a job in a near future.