Undergraduate Work Placement Programme

School of Computer Science & Information Technology

University College Cork

Student Name	Nathan Crowley
Student Number	118429092
Company Name	Clearstream Global Securities Services Ltd
Company Address	Cork Docklands South,
Company Address	Albert Quay, Centre,
Company Address	Cork, Ireland.
Workplace Mentor	Colum O'Riordan
Academic Mentor	Frank Boehme

Week 1 (22 March – 26 March)

Mon: *Tasks/Activity/Training:*

- HR gave office building tour.
- HR presentations on codes of conduct.
- Presentations on Clearstream's broad business & departments.

*Skills Learned***:**

- Company knowledge.
- Fund is an investment vehicle. (Hedge/Mutual)

Tue: *Tasks/Activity/Training:*

- Meeting with Peter & Colum.
- Begin setup with help from Peter.
- Set up "SafeNet MobilePASS" used to generate access tokens.

Skills Learned:

- Internally virtual machines (VM's) are referred to as VDI.

Wed: *Tasks/Activity/Training:*

- Set up IntelliJ IDE & Git installed.
- Meeting with team at 10am.
- First team meeting sits along.

Skills Learned:

- The daily meeting processes.

Thurs: *Tasks/Activity/Training:*

- Daily stand-up at 10am.
- IT community meeting at 2pm.
- Setup & catch-up meeting at 5pm.

- Set up Maven & environment variables in windows.
- Configured Maven profiles

Skills Learned:

- Process to create and map environment variables.

Fri: *Tasks/Activity/Training:*

- Daily stand-up at 10am.
- Quiz at 4pm – Friday Fun.
- Meeting with Martin at 3.30pm.
- Phone call with HR about CATS.
- Sent IT ticket about CATS access problems.

Skills Learned:

- Internal ticketing system & CATS system for logging hours worked.

Signature:

Week 2 (29 March – 2 April)

Mon: *Tasks/Activity/Training:*

- 5pm meeting with Colum.
- Dev manager is Martin.
- Outline of the jobs over the 6-month placement.

Skills Learned:

- Java & Oracle for backend, React & Angular for frontend.

Tue: *Tasks/Activity/Training:*

- Email Academic mentor to introduce myself.
- Continue work on 'Install Guide' & set up process.
- New starter meeting at 2.30pm.

Skills Learned:

- What is JBoss servers and how to download & install.

Wed: *Tasks/Activity/Training:*

- 3.30pm meeting with Martin.
- Presentation on Clearstream's business and common clients.

Skills Learned:

- Cork office is mostly dealing with Hedge Funds.
- No money is transferred just securities.

Thurs: *Tasks/Activity/Training:*

- Shown how JCCS & CCS operates.
- Flow diagram of Clearstream business model.

Skills Learned:

- How the company works and how difference inner processes work such as Contract notes being sent to confirm the transfer of securities.

Fri: *Tasks/Activity/Training:*

- Scrum meeting at 10am
- Hydrogen meeting at 10.30am.
- JBoss up and running on the VDI.

Skills Learned:

- How to implement a JBoss server and configuration.

Signature:

Week 3 (5 April – 10 April)

Mon: *Tasks/Activity/Training:*

- JBoss installed and working.
- Apache ActiveMQ installed and working.
- Email Peter about CATS access errors.

Skills Learned:

- What apache ActiveMQ is.
- How to start it through terminal commands inside IntelliJ.

Tue: *Tasks/Activity/Training:*

- Stock market meeting 3pm.
- Deutsche Boerse Group (DGB) one of the largest operators in the world.
    - o Over 9,000 employees.
    - o Services Offered:
        - ▪ Pre-IPO
        - ▪ Trading
        - ▪ Clearing
        - ▪ Settlement & Custody   [Clearstream]
        - ▪ Market data & tech-based services   [Clearstream]
        - ▪ Information Technology
- Rang help desk about One drive insufficient memory issue.

Skills Learned:

- Trading systems – Pre-Trading/Trading/Post Trading.
- Dividends – part of profit paid to shareholders.
- Market segments & indices – Blue-chip indices prime standard (DAX/MDAX/SDAX)

Wed: *Tasks/Activity/Training:*

- Daily stand-up at 10am.
- Entered CATS hours for first time.

Skills Learned:

- Log work hours through CATS system inside App Launcher.

Thurs: *Tasks/Activity/Training:*

- Daily stand-up at 10am.
- Meeting with Martin about cutovers.
- Meeting with Denise for running and deploy SQL script.

Skills Learned:

- Cutovers and how to create SQL scripts inside Oracle developer.

Fri: *Tasks/Activity/Training:*

- Daily stand-up at 10am.
- Won the Friday quiz!!

Skills Learned:

- Improved communication skills participating in the weekly quiz with the team.

Signature:

Week 4 (12 April – 16 April)

Mon: *Tasks/Activity/Training:*

- Create SQL script that updates LK_EMAIL_TEMPLATES database of automated internal emails.
- Add to each automated email a placeholder for confidential text. [ConfidentialText].

Skills Learned:

- Cutovers and how to create SQL scripts inside Oracle developer.

Tue: *Tasks/Activity/Training:*

- Update JCCS Java and XML code.
- Java code is used to retrieve a string from the XML and replace the [ConfidentialText] with this string.

- Created Getters & Setters for the Java code as well as adding
  @BeanPropertySetters to link the XML.

Skills Learned:

- Created first code to be used in the next release implementing Java,XML
   and SQL.

Wed: *Tasks/Activity/Training:*

- Learn the process of executing a cutover.
- Use 'Putty' to transfer my updated 2107 folder to the Dev environment.
- Perform DDL/DML checks using SOAP UI.

Skills Learned:

- DDL/DML checks and how to test cutovers with SOAP UI.

Thurs: *Tasks/Activity/Training:*

- Update *run_cutover.sh* to contain 'echo…execute…echo' to execute the
  cutover.
- Add 'transactions' to my SQL. (Begin…Commit…Rollback)
- Meeting with Denise on how JCCS&CCS interact.

Skills Learned:

- How 'transactions can improve SQL.
- How to execute cutover script.

Fri: *Tasks/Activity/Training:*

- Tasked with arranging and generating a general knowledge quiz for the
  team's weekly Friday fun.

Skills Learned:

- Good interaction with the team and good way to introduce myself through
  hosting the quiz.

Signature:

Week 5 (19 April – 23 April)

Mon: *Tasks/Activity/Training:*

- Shown the process for committing to Dev.

Skills Learned:

- GitHub 'shelf' can help you set aside some work and return to it.

Tue: *Tasks/Activity/Training:*

- Daily stand-up.
- Fetch & rebase the most recent IFS2107.

Skills Learned:

- GitHub pull process for JCCS using IntelliJ.

Wed: *Tasks/Activity/Training:*

- Daily stand-up.
- Commit my cutover script and Java/XML changes.

Skills Learned:

- GitHub's commit process through IntelliJ.

Thurs: *Tasks/Activity/Training:*

- Daily stand-up.

Skills Learned:

- Any #300 error solved with instructions inside 'readme_DBPrepSteps.txt' - /local/jcssbin/JCCS_CUTOVER.

Fri: *Tasks/Activity/Training:*

- Daily stand-up.
- Friday Fun Quiz.

Signature:

Week 6 (26 April – 30 April)

Mon: *Tasks/Activity/Training:*

- Meeting with Martin on next project.
- Look at how Mr. T (MessageTransformationEngine) fits into the overall business structure.

*Skills Learned***:**

- Position = positive share balance.
- Mr. T = component to Transformation routing.

Tue: *Tasks/Activity/Training:*

- Create HTML form 'file uploader' in Java.
- Allow Devs to drop files directly into Mr. T speeding up production.

Skills Learned:

- Creating an application inside JCCs.

Wed: *Tasks/Activity/Training:*

- Java JSP form to be created to allow user to select a file/files for upload to Mr. T.
- Send a response to the user confirming their file has been uploaded.

Skills Learned:

- What is a Java Servlet /JSP?
- JSP is just a HTML form that allows you to easily create web content that has both static and dynamic components.

Thurs: *Tasks/Activity/Training:*

- Create a Java Servlet to the handle the actual process of taking in the input file, and outputting it to the correct directory inside Mr. T.
- Add JSP & Servlet to JCCS.

Skills Learned:

- Java Servlets used to extend the capabilities of a server.
- How to implement a Servlet into JCCS.

Fri: *Tasks/Activity/Training:*

- Test the MR. T file uploader locally first to ensure files are not corrupted and are transmitted correctly.

Skills Learned:

- Deploying to JCCS localhost and test my components.

Signature:

Week 7 (3 May – 7 May)

Mon: *Tasks/Activity/Training:*

- Create Java Servlet:
    1 Get user's file.
    2 Create Input Stream to retrieve the file.
    3 Upload to 'jccsbin/jcss/data/messagetransformationengine'.
    4 Create output HTML response.
    5 Map '/upload' URL to servlet.

*Skills Learned***:**

- Servlet development.

Tue: *Tasks/Activity/Training:*

- Add FileUploadAction.java (Servlet) to CCSEngineWAR/java/web/fileUpload.
- Add file-upload.jsp (JSP) to CCSEngineWAR/webapp/WEB-INF/content/web/fileUpload.

Skills Learned:

- WAR files and how to deploy to JCCS.

Wed: *Tasks/Activity/Training:*

- Create Java JSP:
    1 Set *method* to "POST".
    2 Set *enctype* to "multipart/form-data".
    3 Set *action* to '/fileupload/*'.
    4 Add HTML form file input tag.
    5 Create HTML form submit button.

Skills Learned:

- HTML form syntax.
- Ensuring the action="/fileupload/*" matches the <url-pattern> in the web.xml.

Thurs: *Tasks/Activity/Training:*

- Redeploy the CCSEngineEAR file.
- Create link to test code.
- Change file path from 'testDir' to 'realDir'.

Skills Learned:

- Testing JSP and Servlets.

Fri: *Tasks/Activity/Training:*

- Friday fun Quiz.
- Research JSP and Servlet development.

Skills Learned:

- Java web and servlet development process.

Signature:

Week 8 (10 May – 14 May)

Mon: *Tasks/Activity/Training:*

- Further Java research for file uploader.

*Skills Learned***:**

- Research skills.

Tue: *Tasks/Activity/Training:*

- Further Java research for file uploader.

Skills Learned:

- Research skills.

Wed: *Tasks/Activity/Training:*

- Must override the 'doPost' method for handling the file input.
- Create File objects to store the input.
- Create Java Iterator to iterate over the input file and relocate it to Mr. T.

Skills Learned:

- Exception handling for Java servlet.

Thurs: *Tasks/Activity/Training:*

- Project may need two .jar files to be added to 'WebContent/WEB-INF/lib'.
  o Commons-fileupload-1.3.1.jar
  o Org.apache.commons.io.jar

Skills Learned:

- How to add external jars to the IntelliJ JCCS project.

Fri: *Tasks/Activity/Training:*

- Deploy project in JCCS localhost.
- Update JCCs URL to
  'https://localhost:8443/ccs/web/fileupload/fileupload.do' to point to the JSP.

Skills Learned:

- Process of deploying project to localhost.
- Opening my code inside JCCS localhost.

Signature:

Week 9 (17 May – 21 May)

Mon: *Tasks/Activity/Training:*

- Committed JSP & Servlet to JCSS.
- Test file upload on Dev.

*Skills Learned***:**

- JCCS Dev testing.

Tue: *Tasks/Activity/Training:*

- Completed the SOAP UI testing for cutover's java code.

Skills Learned:

- SOAP UI testing.

Wed: *Tasks/Activity/Training:*

- Catch up meeting with Martin on Mr. T file uploader.
- Add @Action result (location = fax.jsp).
- Look at fax.jsp & servlet for the syntax of a JSP and servlet and how they interact.

Skills Learned:

- @Action and its role in @Result inside the JSP.

Thurs: *Tasks/Activity/Training:*

- Updated the doPOST() method inside the servlet for file input processing.
- Added the 'include' properties to the top of the JSP.

Skills Learned:

Fri: *Tasks/Activity/Training:*

- To deploy to Dev:
    1. Run the 'vmdevgss3' maven build.
    2. Copy 'JCCS_PreDelivery' from 'cs.jccs/distribution/target'.
        - '/tmp' using WinSCP.
    3. Once copied to '/tmp' open Putty.
    4. Inside putty **cd ...** to **/**.
    5. **cd /local/jcssbin** and run deploy2107.sh.
    6. Expected last line is "CLI result is: 'result' => 'running'"
    7. Check health at "http://vmdevgcss3:8080/ccs/health-check.do"

Skills Learned:

- Deploying to Dev.
- Health checking.

Signature:

Week 10 (24 May – 28 May)

Mon: *Tasks/Activity/Training:*

- Daily stand up.

- Check that deployment to Dev was completed correctly.

Skills Learned:

- Internal Deployment process.
- Sub custodian is a bank that provides safe keeping in domestic markets to another custodian.

Tue: *Tasks/Activity/Training:*

- Fund / Financial management meeting.

Skills Learned:

- Mutual Funds and their key features. Such as:
  - Small initial investment.
  - Cash is readily available.
  - Policies are narrowly defined.

Wed: *Tasks/Activity/Training:*

- Daily stand-up.
- Operational Functions meeting.

Skills Learned:

- Clearstream aims to be a 'one-stop-shop' that offers both functionality for Mutual and Hedge funds.
- **Vestima Plus   = Mutual funds.**
- **Vestima Prime   = Hedge funds.**
- Hedge funds are high risk investment vehicle.
  - Aggressively managed.
  - Both domestic & international.
  - Consistent high level of return.

Thurs: *Tasks/Activity/Training:*

- Daily stand-up.
- Trading process meeting.

Skills Learned:

- Client places order via Vestima Prime.
- Trade loaded to CCS & enriched with Fund rules.
- Ensure accuracy f orders & adhere to Fund rules.
- Once all Authorized, place the trade (OTF – order to fund).
- Client advised trade is being processed (OTC – order to client).

Fri: *Tasks/Activity/Training:*

- Friday Fun Quiz.

Signature:

Week 11 (31 May – 4 June)

Mon: *Tasks/Activity/Training:*

- Meeting with Martin.
- Given task of updating 'Fund Audit Report' JCCS page.
- Export button creates a **xlsx file** that needs to contain confidential placeholder in the generated file name.

*Skills Learned***:**

- Solved **xlsx file** by updated the FundAuditReport java source code inside JCCS.

Tue: *Tasks/Activity/Training:*

- Meeting on the JIRA internal ticketing process.
- JIRA is a software work management tool for a wide range of use cases.

Skills Learned:

- JIRA terminology.

Wed: *Tasks/Activity/Training:*

- JIRA meeting.
- JIRA is great for tracking defects + other internal problems.

Skills Learned:

- JIRA process:
  o Ticket is assigned to a developer.
  o Read description and solve the issue.
  o Commit changes.
  o Review started – Link code change & your solution commit url.

Thurs: *Tasks/Activity/Training:*

- Research for JIRA task.

Fri: *Tasks/Activity/Training:*

- *Friday fun quiz*
- *Complete confidential placeholder JIRA issued to me.*
- *Committed first JIRA.*

Skills Learned:

- First time completing JIRA process.

Signature:

Week 12 (7 June – 11 June)

Mon: *Tasks/Activity/Training:*

- Daily stand-up.
- Check JIRA system for assigned tickets.

*Skills Learned***:**

- JIRA ticketing system.

Tue: *Tasks/Activity/Training:*

- Prepare for upcoming meeting with Martin about DMS?

Wed - Fri: *Tasks/Activity/Training:*

- Clearstream Cork culture induction meeting.

Skills Learned:

- 2018 company culture started.
- Clearstream values customers, results, people, community.
- With customers engage with them and add value to their business.
- Management focus on Honest & Integrity, Work as team, Customer focus.
- Company culture has great events such as: Virtual Quiz, raised €20,000 for charities, Mindfulness with Brezzie, etc.

Signature:

Week 13 (14 June – 18 June)

Tasks/Activity/Training:

- Daily stand ups.
- Prevention of Fraud refresher presentation 2020.
- Fraud Prevention interactive training.
- Requiring a completion rate of 80% or higher to pass the assessment.

*Skills Learned***:**

- Fraud is any attempt to gain funds or information by deception or other illegal means, whether acting alone or in collusion with other parties
- Fraud Prevention training began 2017.
- Learnt regulatory controls and internal policies and procedures.
- Risks of fraud and how to spot and report any irregularities.

Signature:

Week 14 (21 June – 25 June)

> *Tasks/Activity/Training:*
>
> - Began research on the Document Management System, to be used for new IFS Document Library.
> - Research REST API and how to store, retrieve and view documents.
> - Preference on Cloud capabilities and open source.
>
> *Skills Learned***:**
>
> - How to structure a professional report and effectively present a matrix of options of DMS.

Signature:

Week 15 (28 June – 2 July)

> **Monday to Friday:**
>
> *Tasks/Activity/Training:*
>
> - Continued Research on Document Management System.
>
> *Skills Learned***:**
>
> - A Document Management System is a system or process to capture, track, and store electronic documents.
> - How to choose a suitable DMS. Determine your needs, which vendor to choose, manage workflow, etc.
> - Prioritise Security, verify support options.

Signature:

Week 16 (5 July – 9 July)

> **Mon:** *Tasks/Activity/Training:*
>
> - Daily stand-up meeting.
> - Meeting with Siobhan at 2.
>
> **Tue:** *Tasks/Activity/Training:*

- Prepare for presentation to Senior management and HR.
- Student 4 Student PowerPoint presentation on Friday.

Skills Learned:

- In presentation include:
    - Introduce yourself.
    - What college / college course.
    - What Department in Clearstream.
    - What HAVE you done so far?
    - What WILL you do for the next 3 months,
    - What you enjoyed.
    - What can be improved.

Wed: *Tasks/Activity/Training:*

- Prepare for Student 4 Student presentation.

Skills Learned:

Thurs: *Tasks/Activity/Training:*

- Prepare for Student 4 Student presentation.
- Send copy to Siobhan as backup.
- At end ask other interns questions, expect questions from management,

Skills Learned:

Fri: *Tasks/Activity/Training:*

- Student 4 Student PowerPoint presentation to HR and Senior management at 10 o'clock.
- Presentation went well, got asked question from Mr.Brosnan top management.

Skills Learned:

- Presentation skills improvement.

Signature:

Week 17 (12 July – 16 July)

Monday to Friday:

Tasks/Activity/Training:

- Daily stand ups.
- GDPR Overview meeting & presentation.
    - Who to report Data Protection & GDPR breaches to?
    - What is GDPR?
    - How GDPR & Data Protection differ?

- Examples of breaches and their penalties?

*Skills Learned***:**

- GDPR is any information that could identify a living person.
- GDPR relates to personal information whereas Data Protection relates to generic data breaches.
- Consequences of breaches
    1 Up to €10 million or 2% of annual revenue.
    2 Up to €20 million or 4% of global revenue.
    3 Individual also has the right to claim.

Signature:

Week 18 (19 July – 23 July)

Monday to Friday:

Tasks/Activity/Training:

- Daily stand ups.
- Research of SSH and REST API to be used for future project.
- Research Standalone Applications and development process.
- API research related to interacting and using API in backend applications.

*Skills Learned***:**

- SSH is a network communication protocol enabling two computers to communicate.
    - Key feature is encrypted communication.
- SSH client on your local machine connects to SSH server using command line.
- SSH clients typically support SCP and SFTP for transferring data.
- Recommended to use SFTP but SCP will work.
- API give benefit of added computational power.
- API using HTTP verbs (GET/POST/DELETE/PUT).
- Constraints for API to be RESTful:
    - Client-server architecture.
    - Statelessness.
    - Layered System.
    - Ability to cache.
    - Uniform design.
    - Code on demand.

Signature:

Week 19 (26 July – 30 July)

    Mon: *Tasks/Activity/Training:*

- Meeting with Martin & Colum on next project after DMS Research.
- Daily stand-up.

    Tue: *Tasks/Activity/Training:*

- Next step is to convert Research to Proof of Concept of DMS.
- Testing the DMS in a virtual machine using REST API.
- Create a Standalone App for testing.

    Skills Learned:

- What is a proof of concept?
- How to create a standalone app inside a virtual machine.

    Wed: *Tasks/Activity/Training:*

- *Meeting with Colum & Martin for Proof of Concept.*
- *Requirements for Proof of Concept.*

    Skills Learned:

- UI mostly JCCS anyway.
- API more important.
- It will sit in the backend using API calls to interact.
- How does it store the documents, where does it store them?
- Cloud exposure?

    Thurs: *Tasks/Activity/Training:*

- Prepare for Proof of Concept.

    Fri: *Tasks/Activity/Training:*

- Friday Fun quiz.
- Get virtual machine requirements and ask Colum to create a VM.

Signature:

Week 20 (2 August – 6 August)

    Mon – Fri:

    Tasks/Activity/Training:

- Get VM credentials and test connection with Putty.

- Back in the office this week.
- Catch up with Martin.
- Take a look at a JIRA for filter problem with template-enquirey.do

Skills Learned:

- Standalone is an app that runs locally and doesn't require any externals to operate.
- SSH is the network communication protocol used to let two computers to communicate.

Signature:

Week 21 (9 August – 13 August)

Mon: *Tasks/Activity/Training:*

- *Filter problem with template.do JIRA.*
- *Daily stand-up.*

Tue: *Tasks/Activity/Training:*

- UCC mentor meeting with Frank.
- Go over all work completed so far and ran through my projects.

Skills Learned:

- Professional to college presentation skills.

Wed - Fri: *Tasks/Activity/Training:*

- Learn LogicalDOC Api calls and functionality.
- Work on JIRA.

Signature:

Week 22 (16 August – 20 August)

Mon – Fri: Tasks/Activity/Training:

- Proof of concept theory.
- Test JIRA with (id=172714).
- Use SQL to test JIRA expected outputs.
- Download LogicalDoc and transfer to VM with WinSCP.
- Check LogicalDoc READ.me for info on installation.

Signature:

Week 23 (23 August – 27 August)

Mon: *Tasks/Activity/Training:*

- Last week before placement completed.
- Daily stand-up.

*Skills Learned***:**

- Communication and office skills.

Tue: *Tasks/Activity/Training:*

- Ask Colum to sign Work placement Report & Logs.

Skills Learned:

Wed: *Tasks/Activity/Training:*

- Ask Colum may I have a reference & potential Graduate programme.
- Explore LogicalDOC API with curl commands.

Skills Learned:

- API calls with curl command.

Thurs: *Tasks/Activity/Training:*

- Work on Proof of Concept.

Fri: *Tasks/Activity/Training:*

- Final day.
- Hand back Laptop & monitor.
- Thank all the staff for a great placement and learning experience.

Skills Learned:

- Communication, office work routine, working in a team, independent thinking and problem solving.

Signature:

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