

CMT305 Year in Industry (PGT)

Draft Placement Report

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Placement Provide: ID Business Solutions (IDBS)

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1. Placement Overview

1.1. *Company Overview*

IDBS is a leading provider of purpose-built software solutions to accelerate scientific research and innovation in the bio-pharmaceutical and life science sectors. With over 30 years of expertise, IDBS specialises in delivering cutting-edge technologies and unified software platforms that empower BioPharmaceutical organisations in optimising their workflows, enhancing data management, and facilitating collaboration at every stage of the scientific research journey - from data capture and analysis to reporting and sharing. These contributions are pivotal in speeding up the development of ground-breaking therapies.

A cornerstone of IDBS's product offering is the signature E-WorkBook, an advanced software platform that plays a critical role in integrating and contextualising data across the research and development continuum. This platform allows scientists to store, access, and collaborate on laboratory data within a unified system, greatly improving data integrity and usability. Building on this foundation, IDBS introduced Polar, the world's first BioPharma Lifecycle Management (BPLM) platform. Polar is a cloud-based system designed to address the challenges in process design, optimisation, scaling, and technology transfer, enhancing efficiency across biopharmaceutical development processes.

In the competitive landscape of biopharmaceutical and life science industries, IDBS holds its ground against rivals such as LabWare, PerkinElmer, and Biovia. Leveraging its pioneering BPLM platform and extensive industry expertise, IDBS has secured a significant market share and serves an impressive prestigious customer base, including Pfizer, GSK, Samsung Bioepis, Lonza, etc. As a part of Danaher, IDBS benefits from a vast network of strategic partnerships with other industry leaders like Leica, Molecular Device, Beckman Coulter, and Sciex. These collaborations enhance IDBS's ability to leverage cutting-edge science and technology, furthering its mission to improve quality of life through its contributions to biotechnology, diagnostics, and life sciences.

1.2. *Section/Department/Team Overview*

I am a member of 'Pathfinders', a feature team within the R&D Operation team at IDBS's Engineering Department. Our team focuses on developing and enhancing features that drive innovation and usability of IDBS's software solutions, specifically targeting improvements in the bio-pharmaceutical and life sciences sectors. As part of the R&D Operation team, Pathfinders are pivotal in the strategic development of core products, particularly focusing on Inventory and Request - tools in E-WorkBook and Polar that are essential for managing and tracking laboratory resources and workflow. We are responsible for pioneering new features and refining existing ones to meet the evolving needs of our customers and to stay ahead of market trends.

Our primary activities encompass software feature development, user experience enhancement, and rapid resolution of customer issues. We employ agile methodologies to prototype, test and deploy developments swiftly, ensuring that new features meet the evolving demands of our customers and keep pace with market trends. Collaboration is central to our operations. We work closely with the Product

and Customer Support departments to align our development goals with market demand and client feedback. Our 'show and tell' sessions with these departments ensure that our innovations are practical and meet user requirements, thereby enhancing customer satisfaction and loyalty.

The contributions of the Pathfinder have been instrumental in several key product updates and enhancements that have improved data and workflow management for our users. Notably, in collaboration with another feature team WOMMBLs, we successfully launched a new property management feature in Inventory, which the teams have prepared for over a year. This update, the biggest change in Inventory's 9 years history, has streamlined the tracking of laboratory resources, improved data accuracy, and enhanced operational efficiency. This initiative has had a profound impact on accelerating scientific research and discovery among our client base, demonstrating our team's critical role in advancing IDBS's mission. I was glad to be part of this initiative and contribute to its success.

1.3. Placement Summary

Being a software tester within the Pathfinders team, I play a crucial role in ensuring the quality and reliability of core software products, specifically focusing on Inventory and Requests modules. My responsibilities include designing and executing a variety of tests - exploratory, regression, and performance tests - to ensure that new features and updates function as intended and meet both functional and non-functional requirements without disrupting the existing system. Following up on the completion of test activities, I document and track testing outcomes by using Jira extensively, providing detailed feedback to the development team. In cases where defects are identified, I work closely with the developers to troubleshoot and resolve issues prior to product releases. This close partnership is vital for maintaining the high standards of software quality IDBS is known for.

With the variety of responsibilities that I have in the software tester role, it is important to plan my time wisely and prioritise daily tasks to ensure an efficient and effective work approach. My day-to-day activities are heavily centred around effective communication and agile practices. Daily stand-up meetings keep the team aligned on progress and raise any obstacles, while swarming sessions with developers help me understand feature implementations and refine test strategies early in the development cycle. Post-testing, I conduct acceptance meetings with the product owner to ensure the delivered work aligns with customer expectations and to integrate any necessary feedback.

This role has honed my abilities in time management and prioritisation, essential skills for managing the complexities of large-scale software development projects. By engaging in continuous improvement cycles and agile methodologies, I contribute effectively to reducing risks and enhancing product functionality, preparing me well for a future career in software engineering.

2. Work Experiences

2.1. Work Experiences - First Half of the Placement

2.1.1. Work Impact

During the first half of the placement period, I was still exploring different approaches and gaining experience in the field of software testing. Fortunately, my team at IDBS was very supportive and provided me with various opportunities and autonomy to contribute to the work. A noteworthy example of a task I worked on during this time was executing performance testing for a critical new feature being developed. By conducting thorough performance testing on the newly developed API, I found out that although the time for executing the API was within our expectations, the aftermath of the API action (updating audit logs) significantly impacted the overall system performance, which had never been thought of during the implementation process. Following the performance testing, I documented and visualised the results of the test in the ticket, highlighting the limit of the current performance to foster further discussion in the team to consider potential optimisations and improvements.

This finding led to further analysis and collaboration within our team to optimise the auditing process and improve overall system performance. As a result, developers and the product owner in our team worked together to come up with an optimised plan to address the performance issue, which led to a new epic being created and prioritised for the next development sprint. Reflecting on this task, I recognise the significant learning curve I navigated and the vital support of my team. This experience not only highlighted the importance of performance testing in ensuring the overall system efficiency and stability but also demonstrated the essence of testing as an integral part of the development process, which is to test the boundaries of software and identify potential vulnerabilities or limitations that may have been overlooked.

This formative experience has instilled in me a thorough appreciation for performance testing's role in development. Understanding the ripple effects of new features on existing systems has prepared me to anticipate and mitigate similar issues in future projects. The ability to proactively contribute to system optimisations will be invaluable in my ongoing studies and professional endeavours, equipping me with a forward-thinking approach to problem-solving in test-driven environments.

2.1.2. Work Reflection

When I embarked on my journey as a software tester at IDBS, the initial challenge I encountered was transitioning from a straightforward mindset of merely ensuring functionalities to considering edge cases and potential vulnerabilities in the software. Not only because of the limited knowledge I had towards the product and the system as a whole, which led to the lack of sensitivity to potential issues and affected areas of the newly implemented features but also because my academic focus had been more on the development aspect and neglected the importance of thorough testing and quality assurance practices.

Identifying my limitations, I actively sought opportunities to learn and improve my testing skills and understanding of the product. For instance, I actively participated in the team's backlog review meetings where we discussed the scope of work and identified potential implementation and testing scenarios, which helped me gain a deeper understanding of the functionality and be able to consider wider scenarios and

potential edge cases when designing test approaches and performing testing. Additionally, I sought feedback from more experienced testers and developers, both in my team and in other teams, to understand their perspectives and learn from their experiences. Through this reflective practice, I recognised the need to align more closely with the test-driven development principle.

The evolution of my skills and the broadening of my understanding have fundamentally altered my approach to testing. Looking forward, I would place even greater emphasis on continuous learning and collaboration from the project's inception, ensuring a more proactive stance in QA processes. The lesson here is clear: a comprehensive perspective is not just beneficial but essential in test-driven development. Should I encounter similar circumstances in the future, I will invest more time upfront in understanding the system holistically and seek out varied feedback earlier in the process, all to underscore the role of quality assurance as a cornerstone of software development.

2.1.3. Supervisor Feedback

Following the company's practice, I frequently receive feedback from my line manager through our bi-weekly 1-2-1 meetings. During these meetings, my supervisor provides constructive feedback on my performance and suggests areas for improvement. As I navigated through my initial placement at IDBS, my supervisor observed my approach to the workload and my eagerness to deliver at the level of experienced professionals. While appreciating my diligence, the feedback I received was unexpected yet profound; my supervisor pointed out that my focus on delivering at the level of experienced professionals sometimes led me to overlook certain aspects of testing, such as considering edge cases. My supervisor advised me to moderate the pressure I was imposing on myself and not put too much pressure on myself to deliver at the same level as experienced professionals. He reminded me that as a student, my primary role was to learn and develop, and that I wasn't expected to shoulder the same responsibilities as my full-time colleagues. I should utilise the time in this placement period to learn from different experiences and perspectives, and to focus on building a strong foundation of testing skills.

Reflecting on this advice, I realised I had been setting exceedingly high expectations for myself, perhaps to the detriment of my learning experience. I was trying to prove my capabilities, but in doing so, I may have risked overlooking the invaluable opportunity to ask questions and absorb knowledge from those around me. I also realised I sometimes put too much effort into trying to solve the problem I encountered on my own and ended up wasting time researching but not coming up with the solution. I should seek an opinion from my colleagues and most of the time they could provide me with an efficient solution promptly. The feedback was a pivotal moment, prompting me to reassess my approach to work and acknowledge the importance of seeking help and guidance when needed.

I took this feedback to heart, adjusting my mindset towards a more balanced, learning-focused work ethic. I began to actively seek clarity and guidance when needed, shedding any hesitation to ask questions. This not only improved my understanding of

complex tasks but also fostered a healthier work environment for myself. By embracing this change, I have become more receptive to the learning opportunities presented during my placement, ensuring a richer and more beneficial experience. I now recognise the importance of pacing oneself and integrating learning with doing, a balance I intend to maintain in my future professional endeavours.

3. Development of Core Competencies (soft skills)

3.1. *First Half of the Placement*

- Use of tools standards, methods, applications - Experience in
During the first half of my placement year, I have learnt to utilise different tools to help me with my daily tasks and make my work more efficient. In terms of task management, we have Jira to organise stories and provide clear instructions on different tickets. It makes our work allocation clearer and easy to follow each other's working processes. For testing tasks, we have Robot framework and RIDE for automation test scripts used in regression testing; and we have NeoLoad for performance tests, which is an easy-learning browser-based testing tool integrated with the CI/CD process.
- Communication Skills - Experience in
In terms of communication skills, working in a highly agile team has strengthened my communication between team members and across the teams. My role has required me to communicate with both technical and non-technical team members, ensuring clarity and a smooth testing process. During my placement year, I had the chance to take the lead in the daily stand-up meeting of our team, and I am responsible for updating the team on the progress of testing tasks, and raising any issues or blockers that may affect the testing progress. In addition, working in a test-driven development environment, I have also developed strong communication skills through frequent communication with the developers to ensure alignment on requirements and to address any potential issues and defects to be resolved in a timely manner. In spite of technical communication, I have also honed my communication skills by explaining technical issues and demonstrating the solutions to non-technical stakeholders, i.e. the product owner.
- Security, Privacy & Ethics - Knowledge of
In terms of security, privacy and ethics, IDBS puts a strong emphasis on protecting customers' data and ensuring a high standard of integrity. During my placement, I have been provided with comprehensive training on the company's information security policies and procedures, including the importance of data protection, confidentiality, and compliance with relevant regulations such as the General Data Protection Regulation (GDPR).
On a practical level, my daily responsibilities include conducting a checklist following the quality management strategy. This procedure ensures that potential risks are handled and documented appropriately to consistently maintain a high-quality product. Through these practices, I have developed a keen awareness of the integral role that security and privacy play in the realm of software testing and the broader industry landscape.
- Time Management Skills & Approach to Work - Knowledge of

With the flexibility to arrange my priorities for work and manage my own workload, I have started to develop my time management skills during my placement at IDBS. In corporate with the scrum methodology, I learned to segment my workload into manageable tasks, reassessing and adjusting priorities bi-weekly to align with the sprint goals. This approach has not only enhanced our team's ability to track progress and identify potential roadblocks but also improved our collective efficiency in allocating time and advancing work.

Despite the project management method, utilising Jira as the project management tool has been pivotal in monitoring my tasks, documenting details, and prioritising them based on assessed risks, importance, and urgency. A case in point is Jira's intuitive interface, where high-priority tasks are automatically escalated to the top of the To-Do column and marked with an orange arrow, signifying their significance. This feature aids in visualising workflow, enabling developers and testers alike to focus on the most critical issues first, thereby optimising our productivity and ensuring a systematic approach to project completion.

- Knowledge - Knowledge of

My placement has expanded my knowledge of industry-standard QA practices and the importance of testing within the software development life cycle. Initially, my understanding of software testing and concepts of various testing methods was quite limited. During my placement, I have gained a deeper understanding of various testing techniques such as unit testing, integration testing and regression testing, and have the capability to choose from different approaches based on the complexity of features implemented and potential risks assessed. For instance, for stories classified as medium to high risk, it is a standard practice to develop new scripted tests and integrate them into our existing regression test suite. This ensured ongoing monitoring and maintenance of system integrity as new features were added. Utilising the knowledge gained from daily tasks, I contributed effectively to our testing strategy by designing test approaches and creating test cases that cover different scenarios and edge cases. This knowledge has contributed to my decision-making ability as it provides the decision breakpoint for when and how to extend testing based on evolving project needs.

- Autonomy - Experience in

In IDBS, I was given a high level of autonomy in my role as a software tester. I was trusted to work with substantial autonomy, taking personal responsibility for complex and high-risk testing tasks. For instance, I was given the opportunity to handle the update of regression tests and performance tests regarding a major update of our software platform related to the third-party cookies policy of Google, which affected how our application communicates with external services and required extensive testing to ensure compatibility and functionality. I took ownership of this task even though I did not have experience in using the performance testing tool (NeoLoad) before, which not only allowed me to gain knowledge of a new tool but also showcased my ability to adapt quickly and resulted in a successful and smooth release of the software update. I was trusted to plan and execute my own test strategies, prioritise my workload, and make independent decisions regarding the best approach for testing different features and functionalities. While I was given to freedom to take ownership

of tasks, I received regular feedback from my line manager and team members to ensure I was on the right track and to address areas that I could improve on, which provides a perfect balance between independence and mentorship as a placement student.

- Influence - Experience in

Although my work may not directly contribute to the customer's decision-making process, my job is to ensure we deliver high-quality software to our customers to enhance their user experience and satisfaction. Through consistent communication with the feature team and the product owner, I was able to influence our technical work via thorough testing and reporting findings. A notable instance occurred when I once identified a critical performance issue of a newly implemented API, which might result in user confusion and data duplication due to the delayed UI updates. By documenting the performance testing result with timestamps and informing the stakeholders in our team, including the developers and the product owner, the issue has resulted in re-designing the workflow and a new epic focusing on API performance improvements. My input as an intern, despite my initial inexperience, visibly shaped the team's strategies and work direction. This experience has given me the confidence to voice concerns and suggestions I have found in the future, secure in the knowledge that my contributions are valued and impactful.

- Complexity - Knowledge of

The complexity of my tasks has encompassed a range of technical activities, and I have developed an understanding of how to investigate and resolve complex issues. Given the history of the company and the scope of software, it has been challenging to fully understand the entire system and troubleshoot, especially when analysing failed automated tests to pinpoint root causes. However, through collaboration with my colleagues and leveraging available resources such as IDBS Learning Center and Confluence pages, I managed to narrow down the investigation areas and identify potential areas of improvement. This process not only honed my problem-solving skills but also taught me to strike a balance between seeking independent research and seeking guidance, thereby strengthening my overall approach to tackling complex problems in software development.

4. Development of SFIA Professional Skills (hard skills) – TEST

4.1. *First Half of the Placement*

During the first half of placement, I focused on developing my competencies in software testing, aligning with the SFIA 'TEST' skill at Level 3. Here is how I have achieved each criterion of the level:

Designs test cases and test scripts under own direction, mapping back to pre-determined criteria, recording and reporting test outcomes.

As a quality assurance engineer, understanding the functional and non-functional criteria of software is a critical step before designing test cases and scripts. For instance, in testing the new API feature, I designed a comprehensive test approach that included exploratory testing (manual testing), scripted testing, regression testing and performance testing, in which the

scope of testing was defined by the risk assessment we conducted before the implementation stage. Each test case was mapped to the pre-established criteria, which we call the “condition of satisfaction”, to ensure the new API feature met the ticket’s requirements for data integrity, security, performance, and user experience.

During this testing process, I meticulously documented all outcomes and anomalies directly in the relevant Jira ticket for improved traceability and transparency. This documentation was crucial when we identified a performance loophole during the exploratory testing phase, as the issue was clearly recorded in Jira and easily accessible to the team. This facilitated quick and effective remediation.

Participates in requirement, design and specification reviews, and uses this information to design test plans and test conditions.

Before designing test cases and steps for each story or ticket, it is important to fully grasp the functional and non-functional requirements of the software. This ensures our testing approach aligns with customer needs and minimises the likelihood of missing edge cases. I actively participate in our weekly backlog review meetings and the bi-weekly sprint planning sessions, where we discuss the requirements of stories, the scope of implementation, and the testability of new features with the product owner. Additionally, I keep frequent communication with developers, and for more complex tickets, I participate in initial swarm testing to better understand the software's architecture and identify potential implementation issues. This collaboration prevents defects from slipping through and reduces the chances of returning stories due to defects found during later testing stages.

The insights gained from these discussions allow me to craft comprehensive test plans that address both functional and non-functional specifications. This proactive involvement allowed me to anticipate potential issues and design test conditions that are both thorough and relevant.

Applies agreed standards to specify and perform manual and automated testing. Automates testing tasks and builds test coverage through existing or new infrastructure.

With the company’s quality management strategy, we follow specific guidelines and standards to determine the appropriate testing procedures, guided by the ‘Definition of Done’ checklist. This ensures our testing activities align with the company policy and best practices. Adhering to these standards, which are directly tied to risk assessments we conducted before test planning, I specified and executed both manual and automated tests.

For instance, I contributed to creating a new suite of automated test scripts for a newly created feature page using Robot Framework. These automated tests cover from component verification to end-to-end user workflow checks, enhancing test consistency and reliability. By automating these tasks, we reduced testing time significantly while improving test execution precision and catching potential issues in existing systems, particularly during the release phase.

Analyses and reports on test activities, results, issues and risks.

Throughout the testing process, I conducted detailed analyses of test activities, especially for regression testing result reports, and compiled comprehensive reports that outlined all test results, highlighted critical issues and assessed potential risks. Defects are raised accordingly if required. These reports are shared with the feature team, product owner, and stakeholders to ensure transparency and facilitate effective decision-making.

In addition to assessing the system's potential risks and issues, the analysis process also helps in identifying areas of refining in the test script itself. By utilising TARA, the company's automation testing report system, we effectively analysed the number of failed tests and used screenshots to understand their causes and areas of failure. This often revealed the need to update test scripts to accommodate recent changes in the software, enabling us to address issues promptly and prevent further regressions.

5. Relating Theory to Practice

5.1. *First Half of the Placement*

During my CMT313 Software Engineering module, we explored various project management methodologies, including Waterfall, Agile (with both Scrum and Kanban), and others. While the Waterfall method provided a linear, sequential approach, Agile methodologies like Scrum and Kanban emphasised flexibility and iterative progress. In a group project, we opted for Kanban as our project management method, which allowed us to visualise our work, manage flow, and make process adjustments in real-time based on current workloads. This contrasted with Scrum's structured sprint cycles and predefined roles, offering a different perspective on task management and team collaboration.

In my placement at IDBS, I was immersed in a Scrum development environment, starkly different from my academic experience with Kanban. During each bi-weekly sprint, the daily stand-ups, sprint planning, and retrospective meetings of Scrum were a shift from Kanban's continuous flow and less structured format. Practically applying Scrum, I engaged in a more regimented, time-boxed approach, where each sprint had a set of deliverables and goals, fostering a focused and goal-oriented work environment. This practice allows my team to stay aligned and get frequent feedback from stakeholders, ensuring rapid delivery of business value.

Reflecting on both methodologies, I observed that while Kanban provided greater flexibility and a continuous delivery model, Scrum facilitated a more disciplined structure that can be particularly beneficial in managing complex projects with defined phases and deadlines. The daily Scrum meetings ensured consistent communication and immediate troubleshooting, which were less formalised under Kanban during my academic project. The experience underscored the adaptability of Agile principles but also highlighted that the choice between Scrum and Kanban should be driven by the project's nature and team dynamics. Personally, I found the Scrum approach to be more aligned with my working approach, as it provided clear goals, regular feedback, and a structured framework for collaboration. The practical application of Scrum during my placement not only enhanced my understanding of its benefits and challenges but also taught me the importance of

selecting the right approach based on specific project requirements and team environments.

6. On-going Professional Development

My career aspiration is to transition from a quality assurance engineer to a software developer. Working as a software tester has significantly contributed to this goal by providing a comprehensive understanding of the software development life cycle (SDLC), especially through the test-driven development (TDD) practice. This role has deepened my appreciation of the importance of testing in delivering high-quality code and strengthened my ability to design testable and robust software solutions, skills that are not only crucial for any developer but will also be instrumental in my upcoming dissertation project and future career endeavours.

In terms of Core Competency, the communication skills and time management skills that I have gained during this year of placement will be beneficial in my upcoming dissertation project, which has a strong emphasis on collaboration and meeting deadlines under time constraints. Throughout my placement at IDBS and working in a scrum environment, I have honed my time management skills by regularly participating in sprint planning meetings and discussions on our scope of work in each sprint, where we prioritise our work to reach a balance of different development aspects range from front-end, back-end, technical task to testing work, so that we will not overwhelm the team in one sprint. These skills will directly transfer to my dissertation project, where I must complete extensive tasks—ranging from research to implementation—within a stringent 12-week timeline. Moreover, my improved ability to communicate effectively has been crucial in the scrum environment at IDBS. I have learned to articulate clear agendas, pose relevant questions, and solicit constructive feedback through the 1-2-1 meetings with my workplace manager, which will be vital in managing communications with my dissertation supervisor, and ensure that I stay on track with my research and make progress promptly.

Looking forward, the experience I have cultivated as a software tester will be invaluable in of software development career. The SFIA Profession Skills in testing have equipped me with the necessary skills to excel in the field and contribute to the development of high-quality software products. For instance, my expertise in test design and execution helped me develop an all-rounded mindset as an aspiring software developer, to consider the potential risks and defects when implementing new features or making changes to existing software architecture, and consider taking prevention measures when needed. Additionally, my experience in agile development methodologies, such as working in sprints and participating in daily stand-ups, has provided me with a solid foundation for agile development methodologies and collaboration, which are highly sought after in the tech industry.

7. Confirmation and Approval of Work-Based Supervisor

On behalf of [name of placement provider], I [name of work-based supervisor] confirm that to the best of my knowledge, the information in this report is accurate. I also confirm that this report does not contain any confidential information of the kind that should not be seen by employees of Cardiff University or any other UK-based university.