

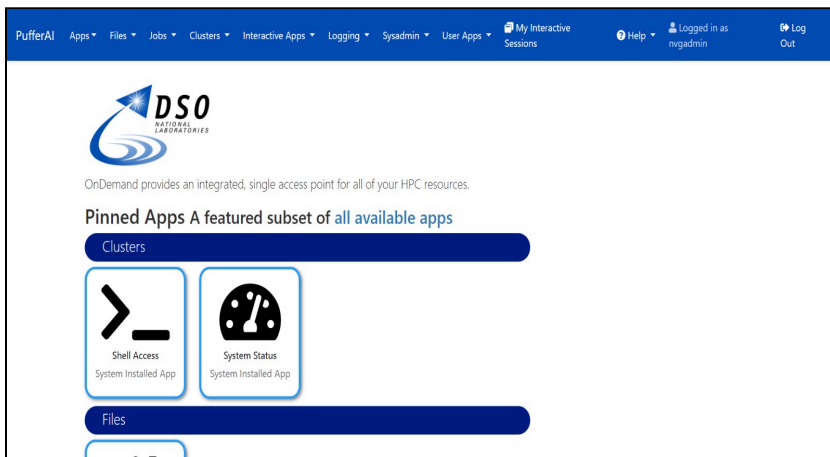
ITP Worklog & Reflection Report

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Submission Week No*: 16	Date Submitted: 29/06/25	School Internship Mentor (SIM): Low Jia Xin	
Tasks / Assignments / Accomplishments (Duration: 2 weeks)			
Overview of tasks / assignments			
	Tasks / Assignments	Accomplishments / Learning Points	
01	DSO Project: PufferAI Portal Customisation.	<ul style="list-style-type: none"> Dug through Open On Demand Documentation to learn about the different types of customisable properties they offer. Tweaked dashboard.yml, to show all installed apps, change dashboard color, and navbar structure. Wrote custom CSS to redesign row headers and element margin. Wrote custom JS to target and change static text content. 	
02	DSO Project: Linking OpenLDAP with Head Node Linux User Account System.	<ul style="list-style-type: none"> Created user groups on LDAP Account Manager (OpenLDAP Frontend). Integrated OpenLDAP with Head Node's System Security Services Daemon (SSSD), effectively allowing LDAP accounts to be equivalent to native Linux Accounts. 	
03	DSO Project: Project Documentation	<ul style="list-style-type: none"> Added screenshots and descriptions to all softwares used. Verified working links to each software portal and added them to documentation. 	
04	Production Harbor Image Replication	<ul style="list-style-type: none"> Installed Harbor on the V100. 	

		<ul style="list-style-type: none"> Configured pull based replication from production harbor to v100 harbor.
05	Self Study: Data Structures & Algorithms (Grokking Algorithms)	<ul style="list-style-type: none"> Went through the first 5 chapters of Grokking Algorithms, and gained better insight into different algorithms. Applied my knowledge to solve various leetcode problems, such as Search Insert Position (35)

DSO Project: PufferAI Portal Customisation.

- Context**
 - After the PufferAI (based on [Open On Demand](#)) Portal was installed, it needed to be customised for DSO.
 - Things such as the banner, page colour and landing page text needed to be changed.
- Task**
 - I dug through Open On Demand Documentation to learn about the different types of customisable properties they offer.
 - This led me to the page on [dashboard.yml](#).
 - With that, I was able to tweak dashboard.yml, to show all installed apps, change dashboard color, and navbar structure.
 - I also wrote custom CSS to redesign row headers and element margin, along with custom JS to target and change static text content.
- Learnings**
 - I gained a better understanding on editing Open On Demand based apps.
 - I reinforced my knowledge of web technologies like CSS and vanilla JS.
- Photos**



DSO Project: Linking OpenLDAP with Head Node Linux User Account System.**• Context**

- PufferAI relies on different user accounts to determine what is viewable.
- For example, a user should not be able to access applications such as KeyCloak or OpenLDAP, which can be used to create new user accounts. Instead, they should only be able to access User Apps.
- On the contrary, a sysadmin should be able to access everything.
- Zheng An wanted two user groups, one for users, and one for sysadmins.
- Ideally, this would be configured on KeyCloak or OpenLDAP for convenience.
- However, PufferAI is not linked to either, and instead relies on Linux Account user groups to determine what is viewable.
- Hence, I was tasked with linking OpenLDAP with the Head Node's User Account System.

• Task

- To integrate OpenLDAP, all that needs to be done is to edit `/etc/sss/sss.conf`.
- Afterwards, the SSD cache needed to be removed by running `rm -rf /var/lib/sss/db/*`.
- Finally, running `"systemctl restart sss"` would restart the service.
 - This is thanks to the detailed [Ubuntu documentation](#), and Yu Hong's help.
- After this, all accounts and groups created in OpenLDAP now appear in the Linux Account System too.

• Learnings

- I learnt about SSSD and PAM, and their roles in the linux ecosystem.
- I learnt how to integrate OpenLDAP with Ubuntu Linux's User Account System.
- I gained a better understanding on how Open On Demand (which PufferAI is based on) handles user accounts.

DSO Project: Project Documentation**• Context**

- This is a continuation of the documentation task from the previous worklog.

• Task

- I added sections for all the installed softwares (eg: KeyCloak, Harbor). Additionally, I added screenshots and descriptions to all of them.
- I also added instructions on how to perform basic tasks, such as pushing images / OCI artifacts to harbor, or performing vulnerability scanning with Trivy on Harbor, as well as creating users on KeyCloak.

• Learnings

- I gained a better understanding on how to write documentation.
- I reinforced my knowledge on the functionalities in different softwares, such as vulnerability scanning on Harbor, user account creation on KeyCloak and OpenLDAP,

from writing the documentation.

Production Harbor Image Replication

- **Context**

- An SSD for NovaGlobal's production server started to fail, which would imminently cause data loss.
- Thus, all important data from the server had to be migrated off.

- **Task**

- I was tasked with replicating all container images / OCI Artifacts off the production server's harbor.
- Zheng An instructed me to install harbor on the V100.
- After doing so, I was able to transfer all data from production to the V100 by configuring a push-based replication.

- **Learnings**

- I reinforced my knowledge on installing Harbor onto a Linux Machine.
- I reinforced my knowledge on replicating data between different Harbor Instances.

Self Study: Data Structures & Algorithms ([Grokking Algorithms](#))

- **Context**

- I always felt that I was weak in DSA, and lacked knowledge and intuition about many common algorithms. A friend then recommended I read this book, which not only goes through the basic common algorithms and techniques like Depth First Search or Dynamic Programming.

- **Task**

- I committed to reading at least one chapter of this book everyday.
- Afterwards, I would go home to try applying the knowledge I had learnt on specific LeetCode Problems.
 - For example, after learning about binary search and divide and conquer, I successfully solved [Search Insert Position \(35\)](#), which requires an algorithm with $O(\log n)$ runtime complexity.
 - I was also able to implement my knowledge of recursion, and how to implement tail call optimisation in my regular recursive function. Since Python does not natively support tail call recursion, I had to use an accumulator as a workaround.

- **Learnings**

- I reinforced my knowledge of big O notation.
- I learnt about how arrays, linked-lists and hashmaps work, along with their benefits and trade-offs.
- I learnt about different types of algorithms, such as binary search, selection sort, and quicksort.

● Photos

The screenshot shows a LeetCode problem titled "35. Search Insert Position". The problem description states: "Given a sorted array of distinct integers and a target value, return the index if the target is found. If not, return the index where it would be if it were inserted in order. You must write an algorithm with $O(\log n)$ runtime complexity." Examples provided include: Example 1: Input: nums = [1,3,5,6], target = 5, Output: 2; Example 2: Input: nums = [1,3,5,6], target = 2, Output: 1; Example 3: Input: nums = [1,3,5,6], target = 7, Output: 4. Constraints include: 1 ≤ nums.length ≤ 10⁴, -10⁴ ≤ nums[i] ≤ 10⁴, nums contains distinct values sorted in ascending order, and -10⁴ ≤ target ≤ 10⁴. The solution is implemented in Python3 using a binary search algorithm. The runtime is 0 ms, beating 100.00% of submissions, and memory usage is 18.44 MB, beating 43.25%. A bar chart shows the runtime performance across different test cases.

Reflections **

As this week is the final week of mid-internship, I will answer more of the middle-internship reflection questions:

What goals have you met so far? What goals do you still need to meet? Have you changed any of your goals?

One of my main goals before starting the internship was to become proficient at Kubernetes. This was because I felt that Kubernetes was hard to learn, especially since I don't have access to enough linux devices that can work as a cluster. Since I knew that most work at NovaGlobal was going to be Kubernetes related, I wanted to utilise the opportunity to become proficient at it.

At this current point of time, I would say that I am halfway there to achieving this goal. I definitely am proficient with basic tasks, such as retrieving resources, editing, applying and deleting manifests and so on. I am also confident in more intermediate tasks, such as using helm, or editing secrets and configmaps. However, I still feel that I am lacking in harder tasks, such as configuring ingress and egresses, or configuring RBAC permissions. In conclusion, I feel that I have not been able to meet this goal just yet.

On a high level, none of my goals have changed much. However, some of their details have changed. Another one of my goals is to get more familiar with web technologies so that I can build better websites in the future. The two that I had outlined before joining NovaGlobal are [HTMX](#) and [Alpine.js](#). I felt that they provided the reactivity I wanted to see, whilst being stripped down and simple enough for a good developer experience. However, after using them to make a webpage for the Rasa Project, I realised their limitations. For websites that needed more reactivity, they did not

cut it, and other strong web technologies such as React, Vue or Angular needed to be used. However, thanks to this experience, I have managed to narrow my future endeavours to use Vue, as I realised that AlpineJS's syntax is almost identical to Vue's, with very minor changes.

What steps have you taken to address the challenges and disappointments that you identified in your early journal entries?

One of my biggest disappointments when I first arrived was the scale of the company. I had simply envisioned it to be way larger. I felt that I would lack avenues to learn in a company of this scale. However, as time went on, I realised that this was not a bad thing after all. One of the benefits that a smaller company has is a drastically decreased bureaucracy. For example, on my first day, I could create my own VM, along with getting access to an A100. In contrast, my friend at NCS had to wait for 3 months before he received a VM and OpenAI API keys that he had requested for on the first day. Now, I realise that the scale of the company doesn't really matter; What matters is how conducive the environment is for working and learning. With that said, NovaGlobal has a good working culture, with many mentors who are willing to teach and guide me.

What have you learned from the routine or boring parts of the internship?

There are often times during this internship that are boring, such as when I have no tasks to do. During the downtime, I would always try to learn and get familiar with new technologies that I had heard of. For example, I have always done self-study, such as on Prometheus, Marimo Notebooks, and AlpineJS. I always make it a point to find something to learn during the downtime. I would then be able to apply my knowledge from that technology to build something that I found interesting. My favourite example would be marimo, as I was able to use it to create a Web Assembly Powered Notebook that determines the colour that occurs the most from an image, and [hosted it on GitHub Pages](#).

All in all, I find that I actually look forward to the "boring" parts of the internship now, as I am able to set out and learn about things that I am interested in.

- * **Report to be submitted fortnightly on Even weeks. i.e., wk2, wk4, wk6, ...**
- ** **Refer to Annex 1 for guides on writing reflection**

LifeSkills Competency developed or strengthened*** (Mid-term/End-term)

***** Refer to Annex 2 for guides on writing LifeSkills Competency developed or strengthened**

Annex 1: How to Write a Reflection

How to write a Reflection

What is Reflection?

Reflection or reflective writing enables the documentation of experiences, thoughts, ideas, and conclusions that signpost your learning journey. It is evidence of looking back at an event, an idea, an experience, and a process that involves the following:

- analysing and commenting on the event from your own experience
- exploring and explaining the importance or relevance of the event
- explicitly saying what you have learned or concluded from the experience

Structure of a reflection / reflective writing

- **Description**
 - What is it? What happened? Why am I talking about it?
- **Interpretation**
 - What is significant / important, relevant, interesting, useful, desirable, feasible, related?
- **Outcome**
 - What have I learnt from this? How will it influence my future work?

Guiding Topics for Internship Reflection

Below are important topics surrounding the workplace for internship reflection.

S/N	Topics	Sub-topics
1	Company Organisation	Type/ organisation structure/ culture/ mission/ product/ service/ industry/ plant tour
2	Diversity & Integration	Workplace/ co-worker/ personality/ education background/ skillsets/ age/ gender/ race/ language/ habits
3	Learning	Types of training/ attitudes towards learning/ learning culture/ ownership/ benefits/ effectiveness/ importance
4	Leadership & Teamwork	Team organisation/ work role of member/ division of work/ leadership style/ communication/ effectiveness
5	Ethics & Value	Punctuality/ work ethics/ workplace safety/ products & services standard/ cybersecurity/ community service
6	Creativity, Innovation & Enterprise	Continuous improvement/ new technology, process & concept/ business idea& processes/ value-add
7	Career Exploration	Skills/ career options/ education level & experience/ advice from mentors, supervisors, co-worker, HR/ career counselling

You may revisit at different times with different level of involvement and context.

- Observer: Observe attentively what is happening, how system works, how people responding.
- Learner: Experience it first-hand the learning, the process, personal feeling & achievement.
- Change Agent: Gain confidence, take action to make a difference to individual or organisational.

Guiding Questions for Internship Reflection

Pre-Internship Reflection

What would you like to achieve from this internship? What are your specific goals? Questions to guide:

- Why do I need to do internship? What would you like to learn from my internship?
- How would it influence my future work? How can I better prepare myself?

Based on your experience at the company, reflect on the journal questions and write down the new ideas or understanding of your existing situation. You can choose to reflect on **some or all the questions** to help you have a better understanding of yourself, the people around you, the company, and your career goals.

Early-Internship Reflection

	<i>Journal questions</i> <ul style="list-style-type: none"> • What are your initial reactions to your first few days? What are you looking forward to? Is there anything you are disappointed about? • What is going to be your biggest challenge in this internship? • Do you feel like you fit in to the organization? Why or why not?
	<i>Things to do to improve and learn from the experience</i> <ul style="list-style-type: none"> • Learn about the history of the organization. • Get a copy of the organizational chart and job descriptions within the organization or department. • Read the entire website of the organization and read relevant marketing materials. If possible, ask for an annual report or similar document. • Ask your supervisor his/her career story. • If you have identified challenges or disappointments in your initial expectations of your internship, put together an action plan to deal with these.

Middle-Internship Reflection (*++ compulsory question*)

	<p><i>Journal questions</i></p> <ul style="list-style-type: none"> • Did you work with a diverse range of people? (++) • How did people from diverse backgrounds work with each other? What did that teach you? (++) • What are things you do not know but necessary for work? How do you learn? Does that give you the confidence to learn new things? (++) • What are the benefits if someone is continuously learning? (++) • Are you involved in any improvement project? What are some new ideas or suggestion you come up with? What is the value-add? How did you arrive at the creative/innovative solution? (++) • What makes someone creative or innovative? Technical skills, interpersonal skills, keeping an open-minded? Do we need creative people at highly automated and regulated workplace? (++) • What goals have you met so far? What goals do you still need to meet? Have you changed any of your goals? • How has your perception of the internship/organization changed since you started the internship? • What steps have you taken to address the challenges and disappointments that you identified in your early journal entries? • What is surprising you about this internship? • What have you contributed to the organization? • What have you done that has made your supervisor's life easier? • What have you learned from the routine or boring parts of the internship? • What do you think are your strongest attributes as an intern? • In what ways do you feel like you can improve your performance? • How do you react to a bad day or disappointment? How would you like to react? • Is your personality a fit for this organization? Do you notice any personality type working in this industry?
	<p><i>Things to do to improve and learn from the experience</i></p> <ul style="list-style-type: none"> • Perform a stock take of your learning. Update your career portfolio with newly acquired work skills. Chart your next step. • Identify the most boring or routine activity in this experience and put together a plan for turning it into an opportunity for learning something new. • Brainstorm with your supervisor for a project or assignment that neither of you had considered before. • Ask your supervisor for a mid-term performance review.

End-Internship Reflection

	<p><i>Journal questions</i></p> <ul style="list-style-type: none"> • How did you accomplish your goals for this experience? • What did you learn about yourself through this experience? • Were your expectations for this experience realistic? Why or why not? • What was your biggest success in this internship? • How did you change from this experience? • What have you done that you didn't ever think you would be able to do? • What is the most important thing that your organization does? • What changes would you make if you had the chance to do this over again? • What would you do differently in this organization if you were the boss/owner? • How would you describe your work style based on your behaviour at this internship? • How are you different than you were when you started this experience? • What was your biggest success or contribution to your organization? • What did you learn from your challenges in this experience? • How do you want your supervisor to remember you? • What recommendations would you give to other students doing an internship at this location?
	<p><i>Things to do to improve and learn from the experience</i></p> <ul style="list-style-type: none"> • Write a summary of your performance <i>from your supervisor's point of view</i>. What would he/she say about you? Write this in the third person. • Think about a new career option that you learned about through this organization. Research on that career. • Write a description of the internship or project that can be added to your resume. • Write a script, make a movie clip or media presentation that summarizes your internship. • Write a handwritten thank you note to your supervisor and 2 or 3 other people at your internship site that had an impact on you. Keep in touch with these people after your internship ends.

Some Examples of Reflection involving Mentorship

	<p><i>Early-Internship</i></p> <ul style="list-style-type: none"> • Ms Sharon Ong from HR arranged an orientation for all interns on 6 Sep 2020. It gave an overview of GE's global business... careers/ progression pathway. I realised GE is huge! The good news is many departments employ engineering graduates! <p><i>Middle-Internship & End Internship</i></p> <ul style="list-style-type: none"> • The production supervisors were not responding to my email despite several reminders. I approached my Supervisor Mr Ali for help. He shared his experience/story... and other ways I tried and it worked! By understanding their working style helped me to accomplish my work! • My Manager Mr John Tan assigned me to the team spearheading roadshows for new product introduction. Am thankful for the opportunity as I see the dynamics and how cross-functional teamwork. It sets me thinking which job nature suits my personal characteristics too!
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Annex 2: Writing Lifeskills Competence developed or strengthen

Mandatory to report any two (2) different LifeSkills competency you have developed or strengthen during the internship:

- (a) Mid-term reporting - Identify one LifeSkills competency you have developed or strengthen during the internship, write it with elaboration into the Worklog & Reflection Report.
- (b) End-term reporting - Identify another LifeSkills competency [**must be different from part (a)**] you have developed or strengthen during the internship, write it with elaboration into the Worklog & Reflection Report.

Table 1 – Frequency of Reporting of Lifeskills Competency

Type of ITP	Mid-term Reporting	End-term Reporting
12-week ITP	6 th week	12 th week
24-week ITP or OITP	12 th week	24 th week

Table 2 - Lifeskills Competency

s/n	LifeSkills Competency & Examples
1.	Communication and Engagement Skills (e.g., ability to write, listen and speak effectively, in person and online, to different audiences)
2.	Global Perspectives (e.g., demonstrates cross-cultural awareness and appreciation for diversity)
3.	Responsibility to the Community, Nation and the World (e.g., keeps up with current affairs and exercise responsibility as a member of the Singapore and global community)
4.	Critical Thinking (e.g., ability to analyse evidence and apply logical reasoning to develop effective solutions to problems)
5.	Innovation (e.g., ability to think of creative or new solutions to solve problems)
6.	Curiosity and Independent Learning (e.g., ability to pursue own learning of new knowledge and skills)
7.	Interpersonal and Collaboration Skills (e.g., ability to work with people from different walks of life and appreciate different perspectives)
8.	Self Awareness and Mental Resilience (e.g., ability to know own strengths and weaknesses, and seek help and feedback when needed)
9.	Personal Effectiveness (e.g., ability to manage own time, physical/mental health and financial resources)
10.	Personal Values and Professional Ethics (e.g., ability to differentiate right from wrong and behave appropriately, including in professional settings)

URL Link to “MOE LifeSkills - LibGuides at NYP Library”:
<https://nyp-sg.libguides.com/moelifeskills>