

Design and Implementation of an Internship Program Integrating OSS Contribution

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Who am I?



- I'm TOKITA Hiroshi.
- I work in Linux support at Fujitsu.
- I'm take a Zephyr maintainer role, and I'm leveraging that experience to participate in the development of SoDeV.
- Today, I will report on the program I participated in during my long-term internship at Fujitsu, where I took part in open-source software (OSS) development.

Cultural background regarding recruitment in Japanese companies

- Simultaneous recruitment system (新卒一括採用)
 - Graduate hiring in Japan emphasizes uniform hiring and early selection of students.
- Environmental changes
 - demographic shifts
 - talent shortages
 - increasing demand for practical skills.
- As a result, **long-term internships** have started to emerge

First, I would like to briefly explain the recruitment culture in Japan. In Japan, there is a traditional hiring practice known as Mass recruitment of new graduates, or *Shinsotsu-Ikkatsu-Saiyo*. As the name suggests, companies focus on hiring university graduates through annual recruitment cycles. Although recruitment paths have become more diverse in recent years, this system still remains a strong cultural norm in Japanese companies. The long-term internship program introduced in this presentation can also be understood as part of this broader shift in recruitment practices.

はじめに、日本の採用の慣行について触れておきたいと思います。

日本では主に大学の卒業者を対象とした新卒一括採用と呼ばれている慣行があります。名前の通りで、この層にフォーカスして、annualなイベントとして採用を行うものです。

近年では採用のパスも多様化が進んでいますが、それでも根強い習慣です。今回紹介する、私たちの長期インターンシップもそのような変化の潮流に位

置つけられるものです。

- <https://www.nikkei.com/article/DGXZQOUC1620E0W4A610C2000000/>
富士通、長期インターンを10倍の300人に 採用でも加味
Fujitsu Expands Long-Term Internship Program Tenfold to 300 Participants, Linking It to Recruitment

- An article in Nikkei highlights Fujitsu's long-term internship program as a **notable case**.
- In particular, the program is described as focusing on **addressing the mismatch between students' expectations** and actual workplace conditions.

Let me introduce a related news article.

This was published by *Nikkei* in June 2024. The article highlighted Fujitsu's large-scale long-term internship program, involving approximately 300 participants, as a notable example in Japan.

The article also pointed out that one of the key goals of the program is to reduce mismatches between employees' expectations and their actual work after joining the company.

新聞の報道を紹介しましょう。

これは2024年の6月の日本経済新聞の報道です。

我々の行っている300人規模の大規模な長期インターンシッププログラムは非常に特筆すべきケースとして紹介しています。

この記事では、入社後の希望のミスマッチを減らすことを期待していると述べています。

- The State of Open Source Japan 2025
<https://www.linuxfoundation.org/research/world-of-open-source-japan-2025>
 - OSS usage is widespread and strategically essential in Japan
 - However, active contribution remains limited
 - Participation is still concentrated among a subset of organizations
- Bridging this gap is a key focus of initiatives such as the AGL OSPO Expert Group
<https://lf-automotivelinux.atlassian.net/wiki/spaces/OSPO/pages/397082627/Publications>

Let me also briefly touch on the current OSS situation in Japan.
Well, I probably don't need to explain this to this audience.

As summarized in the Linux Foundation report *The State of Open Source Japan 2025*, OSS usage in Japan has become widespread and strategically important.

However, active contribution is still limited, and participation often depends heavily on the situation of individual organizations or teams. The AGL OSPO Expert Group has also been investigating this issue, and similarly identifies the difficulty of sustaining OSS contribution as part of normal corporate activities.

OSSと日本の状況についても触れておきましょう。

といっても皆さんもう十二分にご存じですよ？

皆さんが既にお読みになられている Linux Foundationの調査レポートの要旨としては、

日本でのOSS活用は広範に広がり、戦略的に重要なものである
しかし、コントリビューションはまだ限定的で、部署の状況にかなり依存すると報告されています。

AGLのOSPO EGでも調査を行っており、
同様に企業活動としてコントリビューションを行う難しさを示しています。

Traditional vs Emerging Trends in Internships FUJITSU

- Under Japan's traditional "simultaneous new graduate hiring" system, about 30% of hires leave within three years. Addressing and improving this situation is one of the major motivations behind this initiative.

| Traditional | Emerging Trend |
|---|---|
| a few days to one week | 1 to 3 month, paid internships |
| Experience-based programs | Hands-on work on real projects |
| Focused on company introduction and job shadowing | Aimed at reducing post-hire role mismatches |

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In the Japanese employment context, it is often said that around 30% of new graduates leave their jobs within three years. Since Japanese companies have traditionally placed importance on relatively long-term employment, this is generally seen as an undesirable situation. Addressing this issue is also one of the motivations behind the move toward long-term internships.

日本の慣行では、新卒者のおよそ30%が3年以内に退職と言われてい
ます。
比較的長期の雇用を志向する日本ではこの点はあまりよくないと考えられて
います。
この観点も長期インターンシップで解決したいと考えられているものの一つ
です。

Designing internship program

Mentor Background & Motivation

- I was contacted regarding on GSoC2022 (Zephyr Project #1: Arduino module) [gsoc:2022-gsoc-zephyr \[Wiki\]](#)
- I was able to attend this project like as an observer

Several prior experiences supported the design of this internship program. In particular, during Google Summer of Code 2022, I was contacted regarding a project that referenced my proof-of-concept implementation for the Zephyr Project's Arduino module work. I provided technical consultation and mentoring support for that effort, and I continue to be involved in the project today.

This background comes from my ongoing involvement with Zephyr as a frequent contributor and maintainer.

Through this experience, I was able to closely observe how GSoC programs operate in practice, and this strongly influenced the design of our internship program.

私がこのプログラムを実施するにあたって、いくつかの経験がそれをバックアップしてくれました。

特に、2022年のGoogle Summer of Codeのプロジェクトで、私のProof of conceptのプロジェクトを参考にしたいと問い合わせを受けたため、その相談に対応し、現在でもかかわっています。

これは私がZephyrに頻繁にコミットし、メンテナを引き受けている背景があります。

ここで、GSoCでの活動例を近くで見ることができたのが今回のインターンプログラムの設計に大きく影響を受けました。

Design Principles of the Program

- Define a **clear and measurable goal**
→ Upstream commit submission
- Provide exposure to **real OSS development workflows**
- Enable interaction with **diverse developers beyond the mentor**
- Ensure participants understand the **industry relevance of the project**

When designing the program, we needed to define a clear and measurable goal, as is often recommended in internship and education programs.

For us, the goal was very simple:
to submit an upstream contribution.

We also wanted participants to experience real OSS development workflows directly.

Fortunately, AGL includes many engineers with diverse technical and professional backgrounds. We believed that giving interns opportunities to interact with people in this community would itself be highly valuable.

In many ways, these engineers represent excellent examples of what it means to work as a professional software engineer in an open and collaborative environment.

プログラムの決めるにあたって、よく言われるように明確なゴールを考える必要がありました。

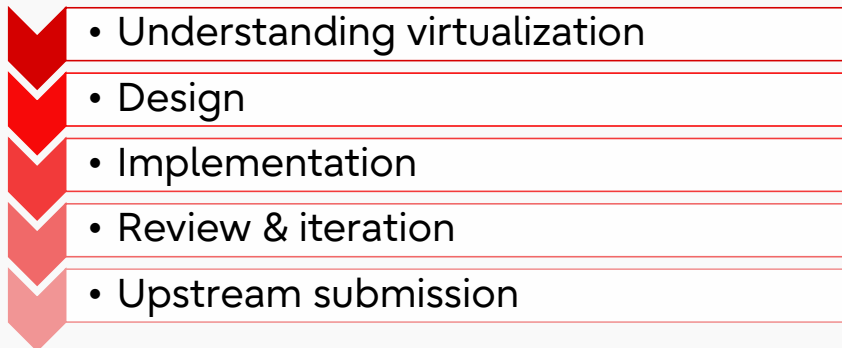
これは非常に明確です。「コミット出す」ことに絞りました。
そして、OSSの活動に参加すること。

幸い、このAGLにも様々なキャリアを持つエンジニアが多くいるので、皆さんと交流してもらうのが良いと思って、それも活動の目的として掲げました。

ソフトウェアエンジニアとして仕事をするのがどのようなものであるかを理解してもらい一番のお手本となる人たちです。

Program Structure #1

- Duration: 2 months
- Theme: Developing Zephyr / virtio-gpio backend



The internship program was planned as a two-month activity. The technical theme was the development of a virtio-gpio backend for Zephyr, intended for future integration into the SoDeV environment. Although we evaluated participants beforehand to some extent, we could not assume prior knowledge specific to this topic. Therefore, the program started with understanding the underlying concepts, especially virtualization. Next came the design phase, where participants studied the OASIS specifications to understand how VirtIO operates. The implementation and review process then followed our normal internal development workflow. Finally, the program concluded with upstream pull request submission.

インターンは2か月で計画しました。

テーマとしては Zephyr による virtio-gpio バックエンドの実装で、これは今の SoDeV に組みこんで使うことを想定しています。

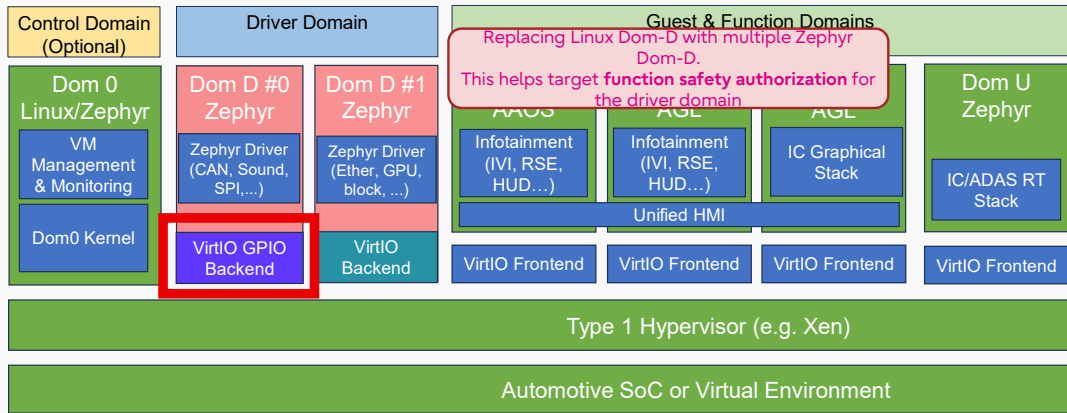
ある程度事前に参加者の適正は確認するにしても、このテーマ固有の知識は前提にはできませんので、その問題、つまり仮想化を理解してもらうところから始めました。

そして、設計、つまり、OASISのドキュメントを呼んでvirtioの動きを把握してもらうこととなります。

その後の実装、レビューは自社の開発プロセスに従いました。

それが終わってPRを出して終わるという計画です。

Program Structure #2



Why This Design Works

- The selected task was **technically challenging and non-trivial** for an internship setting
- However,
 - Existing VirtIO framework by mentor
 - Focused task: virtio-gpio functionality
- But, Even so,
 - strong mentor support required

実際のところこれは野心的なプランで、簡単な課題ではありません。

実は、私の方で既にvirtioの基礎の部分のフレームワークは提出しているので、その成果の上に乗っかることでvirtio-gpioの部分に集中できる条件がありました。

これなら何とか勝ち目が出て来そうです。

とはいえ、達成の可否はかなりメンターの指導の良し悪しにも依存しています。

In reality, this was an ambitious plan and not an easy task for an internship project.

However, I had already submitted foundational VirtIO framework patches beforehand. This created a situation where the internship could focus specifically on the virtio-gpio functionality, rather than building everything from scratch.

Because of this existing foundation, we believed the project had a realistic chance of success.

That said, the outcome still depended heavily on the quality of mentoring and guidance throughout the program.

Practice and outcomes

- The patch has been completed and submitted.
<https://github.com/zephyrproject-rtos/zephyr/pull/101491>
 - However, the review process is delayed due to the feature maintainer's circumstances.
- Participants attended and engaged in real community:
 - SoDeV Meeting
 - Open Source Summit Japan
 - Japan Technical Jamboree @Fujitsu
 - Zephyr Project Meetup: Toyosu @Renesas

As a result, we were able to reach the point of submitting the patch upstream.

It is available at the URL shown here.

However, in reality, the review process has been delayed due to maintainer availability.

We also had the participants engage with real OSS community activities throughout the program.

They attended SoDeV meetings, Open Source Summit Japan, Japan Technical Jamboree, and the Zephyr Project Meetup.

結果、パッチの投稿までこぎつけることが出来ました。

こちらのURLに上がっています。

ただ、メンテナーの事情でレビューが遅れているのが実情です。

また、活動を通じて実際のコミュニティにも参加してもらいました。

SoDeVの会議、OSSJ、 Japan Technical Jamboree, Zephyr Project Meetup にも参加してもらいました。

● Pros

- **Minimal handling of confidential information**
- Participants gained exposure to **cutting-edge challenges in SDV**
- This enabled participants to freely **interact with developers from multiple organizations**, including attending **AGL SoDeV meetings**

● Cons

- **High mentoring cost**
→ Mentors need prior experience with upstream development and community practices
- **Difficulty in task design**
→ Finding tasks that are both appropriate for interns and aligned with OSS project needs can be challenging.
- **Variation in student skill levels**
→ Differences in background introduce uncertainty and risk

Let me compare some of the advantages and challenges we observed through this experience.

One major advantage was that we handled very little confidential information, which significantly reduced management overhead.

Because of this, participants were able to join discussions with engineers from other companies, including AGL SoDeV meetings. I believe this helped them build a more concrete image of what it means to work in our engineering environment.

More importantly, they were able to observe many highly skilled engineers as real role models.

On the other hand, mentoring and task design were extremely challenging. Although this program worked well in our case, the outcome could vary significantly depending on the skill level and background of the participants.

私がこの実践で感じたメリットデメリットを比較してみます。

大きなメリットとして、機密情報を扱わないためこの管理が圧倒的に楽だっ

たということがあります。

このため、他社の技術者と議論する機会に参加できたのは、弊社で仕事を
する具体的なビジョンを提供することに役立ちましたし、何より、多くの
優秀な技術者のロールモデルを見ることになったと思います。

反面、この活動はメンタリングや課題の設計は非常に難しく、今回うまく
行ったものの、参加者のスキル次第ではうまく行かないケースも想定できま
す。

Strengths of GSoC

- Well-established ecosystem
 - community acceptance and support
- Standardized program structure
- Diverse project ideas
- Upstream by default

AGL is also quite familiar with this program.



Let us consider the strengths of GSoC.

For many years, GSoC has provided a large-scale internship-like framework for OSS communities. As a result, many OSS projects already have some level of acceptance and support structure for participants. In particular, it seems that project communities actively help define suitable tasks for contributors. This makes the overall ecosystem quite robust.

Another major strength is the diversity of project ideas. Because many themes are available, participants can choose projects that better match their interests and skill levels.

GSoCの強みを考えてみましょう。

彼らは長年、大規模にOSSコミュニティにインターンシップ的な仕組みを提供しており、

OSS側も既にある程度受け入れ態勢が整っています。

特にやるべき課題の抽出など、OSS側からサポートも得られているようで、盤石なエコシステムとなっているように見えます。

多くのテーマを提供しており、参加者が選ぶことができるのも強みと思いま

す。

Why a Local Program is Matter?

- Language barriers!
- Providing a first touch to open-source development
- Good opportunity to let people know OSS activities within the company

That said, there are several reasons why a Japan-local program would be valuable.

Of course, the most important purpose is to provide an environment with fewer language barriers.

You may be able to tell from my presentation today that this is a real challenge.

Another important effect is internal communication. Such a program can help promote OSS activities within the company and make them more visible to people who are not yet directly involved in open source.

とはいえ、日本固有のプログラムが欲しい理由がいくつかあります。

勿論最大の目的は言語のバリアの少ない環境を提供することです。これは私がいま話すのに苦勞してるからもわかると思います。

また、これは自社内に向けてもOSS活動を広報するという効果もあると思います。

Problems

- High mentoring cost
- Requires experienced OSS contributors as mentors
- Difficulty in designing suitable tasks
- Limited capacity within a single organization
 - Since the status of OSS projects is constantly changing, we cannot always provide suitable assignments for interns.

That said, this is certainly not easy.

The burden on mentors is significant. Mentors need to be OSS contributors themselves, and designing tasks that match each participant's skills and background is not straightforward.

There are also challenges that are difficult for a single organization to address alone. OSS projects constantly evolve, and we cannot always assume that a suitable task will be available exactly when an internship program is planned.

とはいえ、簡単でないのも事実です。

やはり、メンターに求められる要素がそれなりに大きいのです。メンター自身がコントリビューターである必要もあり、参加者に応じたタスクを適切に設計をするのは簡単ではありません。

また、一つの組織で対応することが難しい課題もあります。OSSのプロジェクトの多くは変化する課題と向きっており、インターンをや

るタイミングで
良い課題があるかは断言できません。

A Federated Approach Across Companies



- Collaborate across companies
- Distribute internship themes
- Share mentoring know-how
- Use OSS communities as a platform

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One possible solution is a federated approach across multiple companies. The idea is that each company could run internship projects related to the OSS products or communities where its engineers are already contributing. These individual projects could then be combined into a broader, shared internship program.

In this model, companies would not need to build everything independently. They could share knowledge and best practices for running internships, while also leveraging the collaborative practices that already exist in OSS communities.

とすると、複数の企業による連合的アプローチが一つの解となると考えています。

つまり、企業ごとにコントリビューションしているプロダクトに関連して、インターンを実施できるならば、その集合としてプログラムを構成できないか、という提案です。複数のOSSサポート企業を実施すればプログラムのバリエーションも広がりますし、先ほどのような、「季節変動」にも対応しやすくなります。

インターンシップ運営についてのノウハウ共有や、これまで行われてきたOSS的な協業もその基盤となるでしょう。

- **Improve hiring accuracy through real OSS contributions**
- **Identify candidates based on actual development performance**
- **Strengthen talent acquisition aligned with OSS-driven development**

I believe that OSS-based internships are an excellent opportunity for companies to demonstrate their attractiveness as technology companies. They are not only a way to contribute to OSS, but also a strategic opportunity to attract and identify talented engineers.

For participants, the experience is also highly valuable. Their work can remain visible as a real contribution, and they can learn directly from skilled engineers across companies and communities. For students in particular, this provides a concrete image of what it means to work as a professional software engineer.

This initiative revealed many challenges, including mentoring cost, task design, and differences in participant skill levels. Nevertheless, I believe OSS-based internships can be highly valuable for both companies and students.

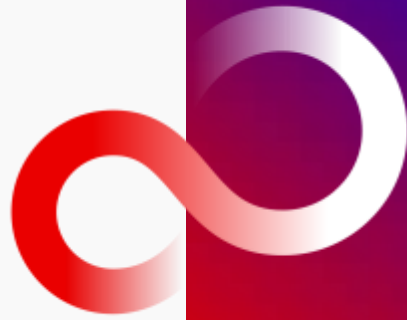
I hope to work together with all of you to develop this activity further.

OSSを通じたインターンはテクノロジー企業としての魅力をアピールするには絶好の機会と考えます。もちろん、それによって、優秀な才能を獲得することにもつながります。応募者も、後に残せる経験ができます。また、この

活動を通じて、優れた技術者の活動、特に学生の場合は企業で具体的に働く姿を知るということもできます。今回の活動で、色々な難しさも判明しましたが、OSS活動のインターンシップは企業にとっても学生にとっても魅力的なものと考えます。是非、皆様と協力してこれを発展させたいと思っています。

**Thank you for
your attentions.**

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