



## LinkedIn Reinvents Onboarding With the Engineering Bootcamp

LinkedIn  
Best Results of a Learning Program  
February 2017



### Company Background



| Company At-a-Glance    |   |
|------------------------|---|
| Headquarters           | Mountain View, CA   |
| Year Founded           | 2003  |
| Revenue                | \$2.99 Billion  |
| Employees              | 9,200   |
| Global Scale           | Headquartered in Mountain View, Calif., LinkedIn also has U.S. offices in Chicago, Los Angeles, New York, Omaha, San Francisco, Sunnyvale and Washington D.C. Offices are located in Amsterdam, Bangalore, Barcelona, Beijing, Dubai, Dublin, Hong Kong, London, Madrid, Melbourne, Milan, Mumbai, Munich, New Delhi, Paris, Perth, São Paulo, Singapore, Stockholm, Sydney, Tokyo and Toronto. |
| Customers/Output, etc. | General members, recruiters, marketers, sales, and learners.  |
| Industry               | Internet  |
| Stock Symbol           | LNKD  |
| Website                | www.linkedin.com  |

### Budget and Timeframe

| Budget and Timeframe |           |
|----------------------|-----------|
| Overall budget       | \$280,000 |

|   |                |
|---|----------------|
| Number of employees involved with the implementation?                                     | 4              |
| Number of Operations or Subject Matter Expert employees involved with the implementation? | 17             |
| Number of contractors involved with implementation  | 5              |
| Timeframe to implement  | 90 days        |
| Start date of the program   | March 30, 2015 |

## Business Conditions & Business Needs

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During 2014, LinkedIn Engineering leadership, in partnership with HR, conducted a deep dive analysis to gain insights into its organizational health. One pain point that surfaced was around the topic of onboarding and how unprepared new software engineers felt soon after joining the company. This led to new engineers not feeling supported, and managers and team members feeling overtaxed. The lack of comprehensive onboarding ultimately became a source of attrition. Some anecdotal feedback from exit interviews suggested that the onboarding program at the time wasn't enough for new hires to feel productive. Constructive feedback from managers surfaced issues such as new engineers having trouble understanding the usage of basic tools, as well as not following standard company-specific best practices.

At the time, LinkedIn Learning & Development provided a one-day six-hour course to introduce engineers to the multiple tools and technology used at the company. Immediate scores for the course (Level 1) were typically high, with an average net promoter score of 60, which showed no indication of being unsuccessful.

Engineering leadership identified engineering onboarding as a top priority, and they tasked Learning & Development to investigate this issue further and propose and deliver an effective solution.

The first step L&D took to gain further insight was to understand the expectations of its stakeholders, Engineering leadership. The company asked them very specific questions, such as:

- What are your expectations of an engineer that is fully onboarded?
- How long should it take for an engineer to be onboarded?
- What are the knowledge or skills requirements for an engineer to be considered onboarded?
- What are explicit indicators or metrics that can be used to measure the performance behaviors of a new engineer?

LinkedIn took leadership's answers to those questions as the basis of a new survey that it sent to all new engineers that joined the company within 30 to 90 days. It also sent surveys to managers of new engineers to collect their feedback as well. The responses of this new survey were jarring.

The following insights were discovered:

- New engineers that have been at the company between 30 and 90 days gave their onboarding experience a -33 net promoter score.
- 50% had little or no experience with standard tools.
- 40% had serious challenges with standard development processes.
- 74% requested more training or documentation.
- 65% wanted a longer onboarding class.
- 85% wanted a more hands-on training program.

While the level 1 feedback of the onboarding program at the time was high, it didn't provide much practical benefits when new engineers assimilate into their roles (level 3).

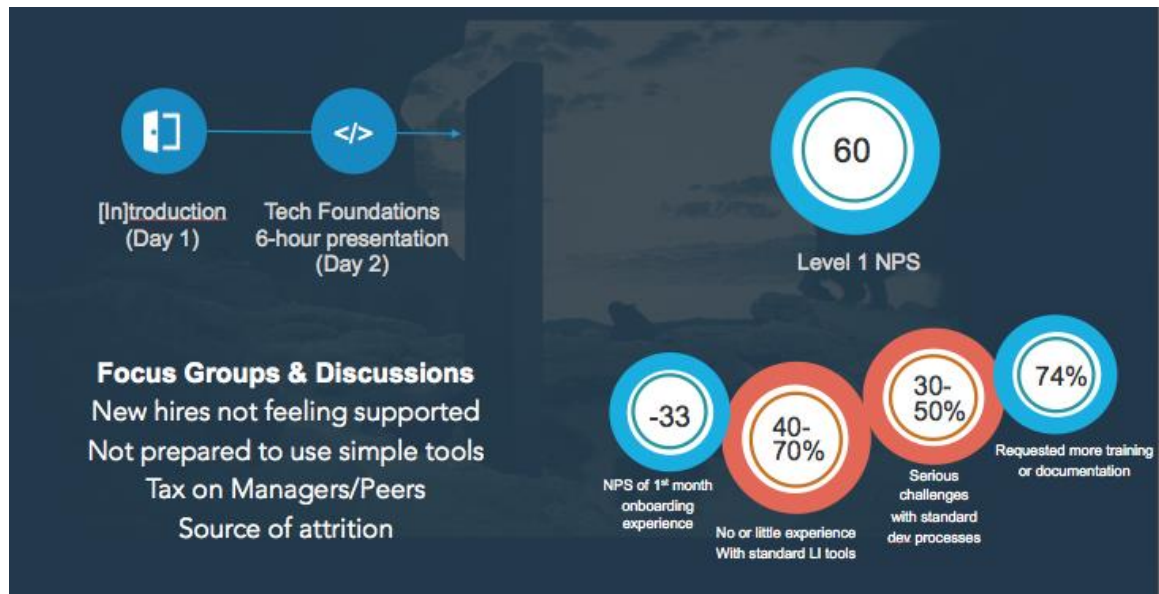
## Overview

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Based on its findings, the goals were very clear:

- Increase new engineers' readiness and confidence of standard tools, technology, and processes (measured through a self-assessment).
- Increase the speed to productivity.
- Increase the job happiness of new engineers within their first 30 days.

Figure 1: Program Details



Source: LinkedIn 2016

Learning & Development proposed a new four-day hands-on onboarding program, dubbed LinkedIn Engineering Bootcamp to achieve the goals identified. It should be noted that the four-day length was initially a constraint given by Engineering leadership. The learning objectives of the program included:

- Work within the tenets of LinkedIn's engineering culture.
- Utilize the breadth of tooling used across Engineering.
- Have a high-level understanding of the LinkedIn codebase.
- Navigate through LinkedIn architecture, applications and frameworks.
- Follow each phase of LinkedIn's development and deployment pipeline.

Engineering Bootcamp was proposed as an in-person classroom program, and was to be completed by all new software engineers during their first week at the company. The program was planned to be located at LinkedIn headquarters in Mountain View or Sunnyvale, CA, the location of 92% of its engineering workforce.

LinkedIn Engineering Bootcamp was initially piloted to new engineers during the weeks of March 30 and April 6, 2015, and launched full-scale during the week of May 4, 2015.

By the end of 2015, the program was completed by over 400 engineers, and not only accomplished all its goals, but exceeded expectations.

## Design of the Program

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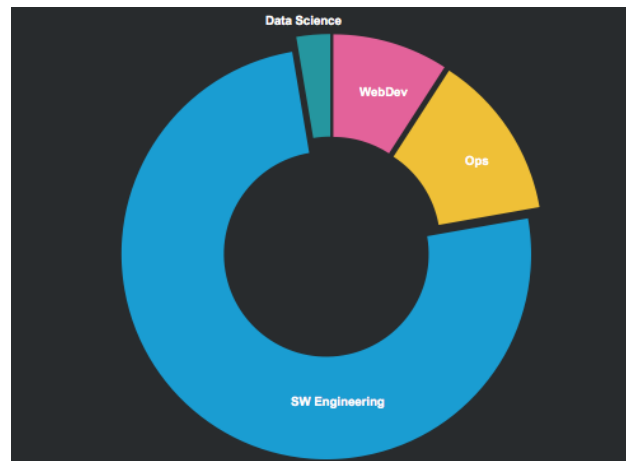
The program was designed within a framework of three components: optimize for a target audience, address skill and knowledge gaps, and incorporate instructional design best practices.

### Optimize for a Target Audience

LinkedIn Engineering is comprised of the following roles: Software Engineer, Web Developer, Data Scientist, Site Reliability Engineer, Technical Program Manager, and Tech Operations. Its prior onboarding class consisted of content relevant to every role. However, as the content grew, its value became diluted for everyone.

The company decided to look at the volume of new hires and made the difficult decision to focus its content around the largest subset, Software Engineering, which it found was 75% of its hires within the organization.

**Figure 2: New Hire Volume**



Source: LinkedIn 2016

After the launch of the pilot, the program was deemed so valuable that Web Developers, Data Scientists, Security Engineers, and Site Reliability Engineers were added to the

audience. While the content of the class didn't relate directly to those roles, it provided just the right context to help new employees in those roles be successful.

## Address Skill and Knowledge Gaps

Based on requirements provided by management, skills, knowledge, and cost gaps of new engineers based on self-assessments of specific tools, technology, and processes were measured. The assessment addressed readiness and confidence levels of engineers that have worked at the company 30 to 90 days. This provided insight into how we can prioritize and optimize content. More time was invested in designing content and experiences that addressed the largest gaps while focusing less time in the areas that were more easily acquired by new engineers.

## Incorporate Instructional Design Leading Practices

The Learning & Development team that was responsible for designing the program believed in three design principles: context, challenge, and collaboration.

Figure 3: Design Principles



Source: LinkedIn 2016

- **Context.** Engineers should experience learning within the same context with which they'll apply their new skills and knowledge. Because of this, a core part of the Engineering Bootcamp experience was designed to have its participants develop applications within the context of the LinkedIn technology stack and infrastructure.

- **Challenge.** Engineers love solving hard problems, and are gratified by demonstrable results. LinkedIn strategically designed hands-on activities to be challenging, while making resources such as online references, “cheat sheets,” and experts accessible. Through LinkedIn’s initial pilot it discovered that as the level of difficulty increased, engineers became more engaged.
- **Collaboration.** One of LinkedIn’s core values is “relationships matter.” It wanted to design a learning experience where new engineers can begin to form new relationships, work closely together to solve problems, and learn from one another. Its hands-on experiences in the program were designed to have new engineers work in teams to develop new applications together on the LinkedIn technology stack.

The design process was completed within one quarter and resulted in a four-day classroom program that had new engineers engaged in the following learning experiences:

- Hands-on Application Development in Teams (70%).
- Interactions with mentors/experts that provided guidance and feedback (30%).
- Engaging presentations (20%).

## Delivery of the Program

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LinkedIn Engineering Bootcamp was announced to the Engineering organization as an agenda item in its Tech All-Hands (monthly town hall meeting). Additional communications soon followed in the form of email and an internal homepage.

Operationally, all new engineers are automatically registered to attend during their first week at the company. All other employees can register to be placed on a waitlist for the class via website or LearnIn, LinkedIn’s internal learning platform.

Two back-to-back pilots for the program were conducted on March 31 and April 7, 2015. The program then took a month to update the design and operations based on pilot feedback, and launched full scale in a weekly frequency on May 5, 2015.

Figure 4: Program Homepage



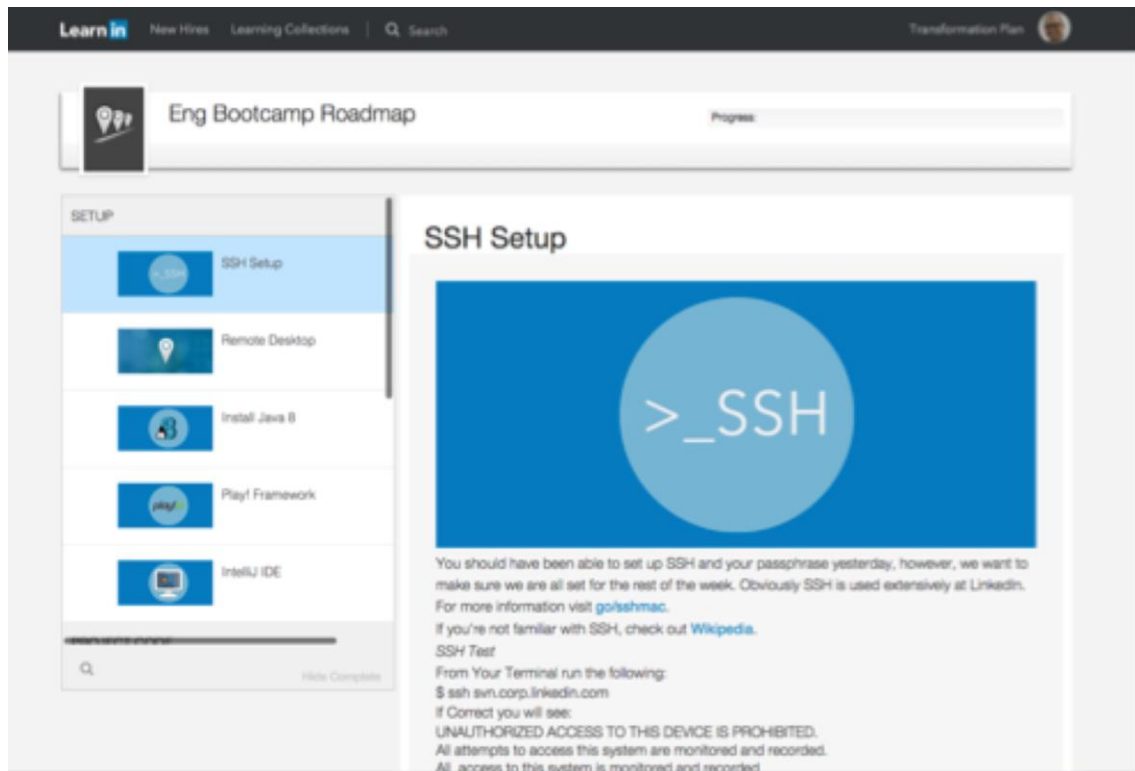
Source: LinkedIn 2016

The day-by-day classroom delivery provided the following experience:

- **Day 1.** On the first day of Engineering Bootcamp, a senior Engineering leader introduces the class to LinkedIn’s engineering culture and how the company aspires to reach its vision of providing economic opportunity to every member of the global workforce. The class also begins to learn about the tools and methods used to build great products at scale. During this time, the class learns how to onboard onto systems and tools using its “New Hire Roadmap” tool on LearnIn.



Figure 5: SSH Setup Page



Source: LinkedIn 2016

- **Day 2 & 3.** In the days following, its new engineers work in teams and begin coding on the LinkedIn technology stack. Each team partners with mentors as they develop their first backend web service and frontend application.

Figure 6: Team Work and Coding

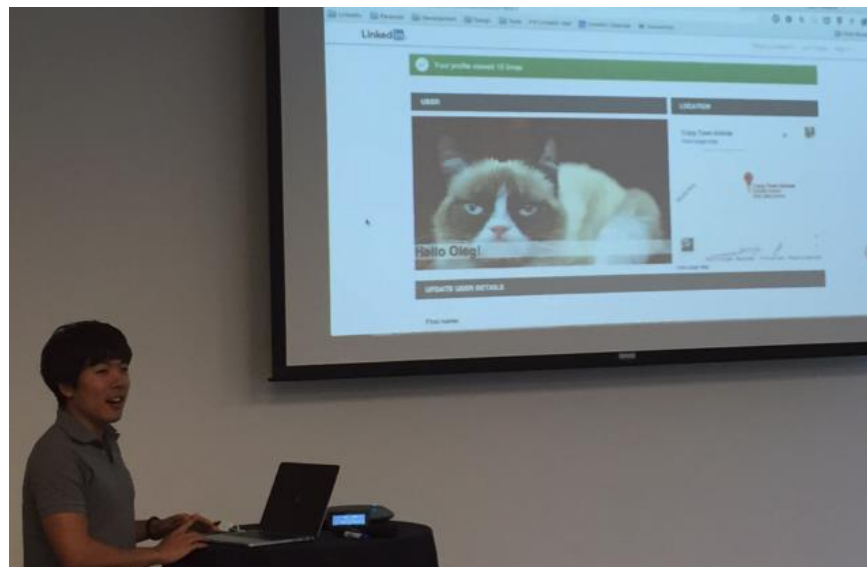


Source: LinkedIn 2016

- **Day 4.** During the last day, each team demonstrates what they built, how they built it, and key lessons they learned. The day ends with an interactive knowledge “assessment” where participants win company-branded t-shirts and swag.

Figure 7: Interactive Knowledge Assessment

Source: LinkedIn 2016



## Change Management Efforts

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The most striking change this program brought was having new engineers join their teams during their second week at LinkedIn rather than their third day. This was remediated by scheduling communications with hiring managers prior to their new hire's first day so that they are aware of their new hire's onboarding schedule.

The second challenge was to alleviate concerns about narrowing the content of the program to focus on software engineering rather than the breadth of the entire Engineering organization. In partnership with Web Development, Site Reliability Engineering, Data Science, and Security, it was decided that the experience and context in Engineering Bootcamp was so important that new engineers should attend during their first week at the company. In addition, Learning & Development partnered with key stakeholders in each team to begin planning onboarding "learning tracks" for their engineers after they completed Bootcamp. These learning tracks consisted of curated online learning assets, self-paced tutorials, and mentor pairing.

The change that required the broadest cross-functional effort was the addition of "Bootcamp Mentors." In its original design of Engineering Bootcamp, the company had underestimated the amount of time subject matter experts needed to be available to answer questions and provide guidance while participants develop applications in class. To help solve this problem, Learning & Development created a Bootcamp Mentor program, where passionate software engineers can register to participate in Engineering Bootcamp as a mentor for a team. In return, they will gain leadership and influencing skills valuable for their own career development. Bootcamp mentors invest six to eight hours per quarter, and are trained on mentoring tasks, skills, and leading practices.

## Measureable Benefits

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Engineering Bootcamp is measured within the framework of Kirkpatrick Level 1, 3, and 4 evaluations.

- **Level 1.** How favorable was the program to new engineers? Key metric: net promoter score.
- **Level 3.** How did new engineers apply what was learned in the program? Key metric: self-assessment on confidence/readiness, net promoter score.

- **Level 4.** What were the business or performance outcomes of this program? Key metric: speed to productivity.

### Level 1

LinkedIn's level 1 evaluation is designed to be taken immediately following the completion of Engineering Bootcamp. Its purpose is to measure the initial favorability of the program. Assessed in the evaluation were:

- Readiness of tools, concepts, and processes to validate the approach to meeting the learning objectives.
- Favorability of instructors and mentors to validate that the right people for the role were identified.
- Timing and duration to validate that the program is the right length and taken at the right time.
- Net promoter score as a key metric to measure overall favorability.
- Open-ended feedback to receive anecdotal data and potential gaps.

### Level 3

LinkedIn's level 3 evaluation is designed to be taken after an engineer's first 30 days at the company. Its purpose is to assess how well new engineers applied what was learned in the program to their jobs. It is based on a self-assessment of their readiness and confidence. Measured in the evaluation were:

- Readiness levels of tools, concepts, and processes to validate skills and knowledge retention when applied to an engineer's role.
- Net promoter score to measure overall favorability after applying what is learned in the program to a new role.
- Open-ended feedback to receive anecdotal data and potential gaps.

### Level 4

As defined by its stakeholders, LinkedIn measures productivity based on code commits. A code commit is the action an engineer takes when deploying code to production after it is approved by a peer-based code review. It measures initial productivity as the time it takes an engineer to make the first code commit, and it measures full productivity by the

time it takes to make the tenth code commit. The company leverages internally-developed engineering tools to help aggregate and report this data.

## 2015 Results of the Program

**Overall.** 432 engineers completed Engineering Bootcamp. In addition to its local California offices, participants have traveled from company offices in Bangalore, Calabasas, Dublin, and New York City. 23 executives have participated as presenters and 26 engineers have participated as Bootcamp Mentors.

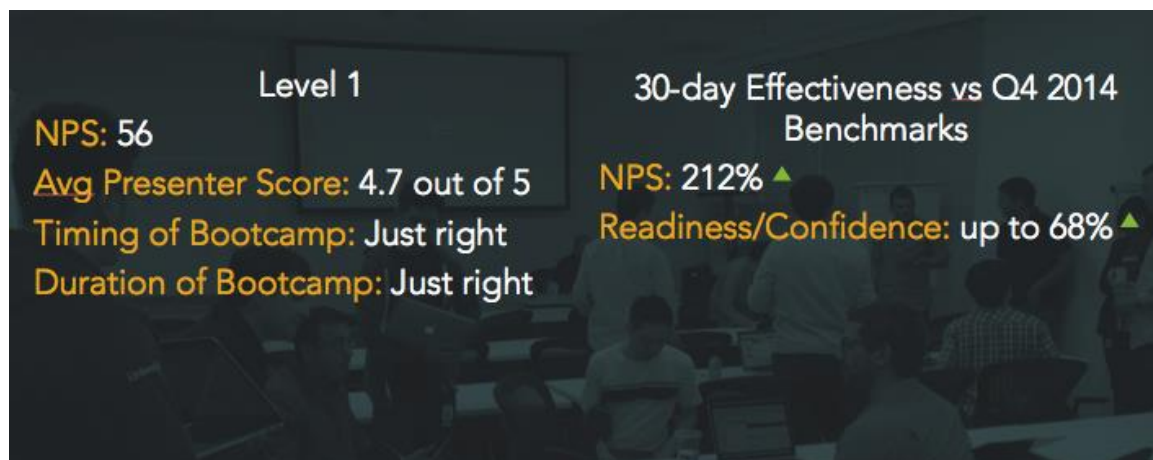
### Level 1

- 56 NPS.
- Average 43% increase of readiness compared to its 2014 benchmark data.
- 4.7 out of 5 average rating of instructors and mentors.
- 94% responded that the program is the right length, and 96% responded that it occurred at the right time.

### Level 3

- 42 NPS, an increase of 212% over its 2014 benchmark data.
- Average 68% increase of readiness compared to its 2014 benchmark data.

**Figure 8: Level 1 Results**



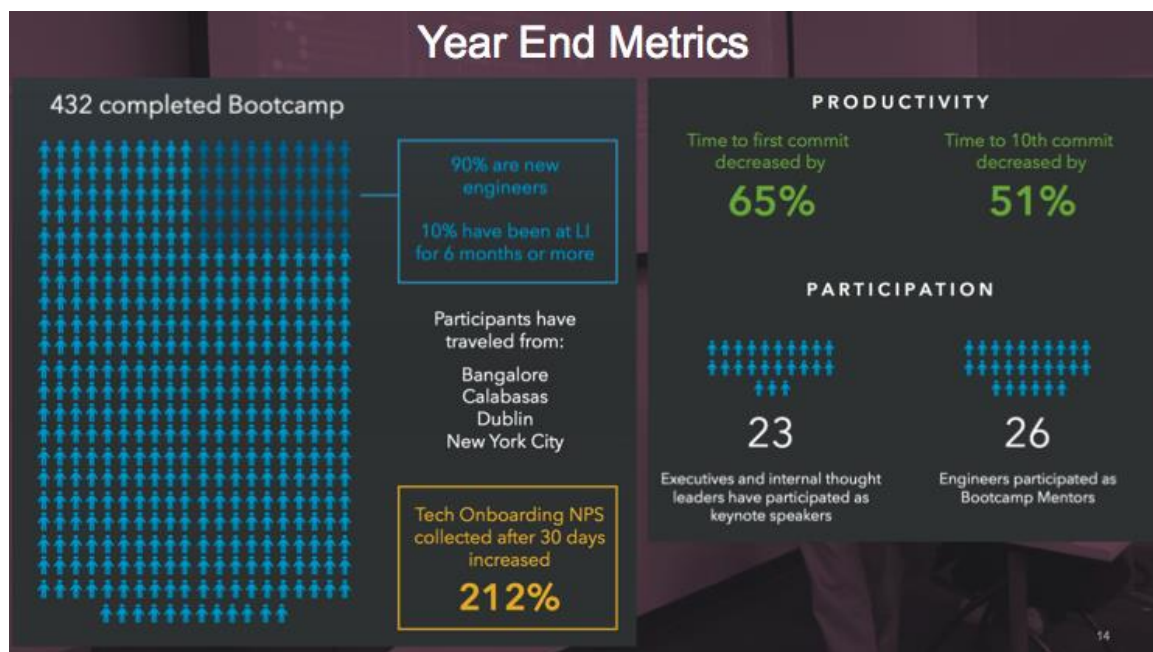
Source: LinkedIn 2016

## Level 4

Prior to the launch of Engineering Bootcamp, it took an engineer an average of 49 days to perform a first commit and 91 days to perform a tenth commit. After the launch of the program, it takes a new engineer an average of 17 days to perform a first commit and 44 days to perform a tenth commit. This demonstrated a decrease of 65% decrease in cost for first code commit, and a 51% decrease in cost for tenth code commit.

The results were overwhelmingly and positively staggering. Because of the launch of Engineering Bootcamp, the rate at which an average engineer is considered fully productive went from about three months to about a month and a half.

Figure 9: Year-End Metrics



Source: LinkedIn 2016

Figure 10: Productivity Cost



Source: LinkedIn 2016

## Feedback

The program has been highly received by the Engineering org, and is now considered foundational to the engineering experience at LinkedIn. It has received overwhelming feedback and praise by its new engineers.

“Quickly going over the various systems was really helpful. Even better was the fact that we got something working and we worked through various problems to experience first-hand without fear of breaking something.”

“This is excellent opportunity to learn the whole LinkedIn system in a few days. It is a fun hands-on experience. Everyone should take it: Make a mistake, learn from mistakes, fail, do it correctly.”

“The hands-on experience is hard to beat. Working with the tools directly is way better than just talking about them conceptually.”

## Overall

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The company learned many valuable lessons during while developing and maintaining Engineering Bootcamp at LinkedIn. Not only did the program demonstrate the high value a comprehensive onboarding program gives to an organization, it proved to be essential to a new employee's success. To validate the program's success to the company, investing in benchmarking metrics and measuring performance was paramount.

## Lessons Learned

- **If you can't measure it, you can't improve it.** LinkedIn's highest priorities when initially engaged was to identify how it measures onboarding performance, how it defines benchmark data, and what its projections are after launching. Doing so allowed the company to follow the impact of Engineering Bootcamp, while knowing how to iteratively improve the program.
- **Level 1 results may not be the most meaningful metric.** Many Learning & Development programs measure success based on a level 1 evaluation. Measuring initial program engagement may surface good insight, but it might not tell the whole story. LinkedIn's prior onboarding class delivered high level 1 ratings, however it proved extremely unsuccessful after conducting a level 3 evaluation.
- **Target the right audience.** Its prior onboarding program tried to appeal to such a broad audience that it resulted in diluting value. Based on feedback given by new engineers, it made the difficult decision to narrow the focus to the largest subset of the Engineering organization: Software Engineers. Following a full-scale launch, Engineering Bootcamp became so successful that it increased its audience scope due to the class providing valuable context for other roles.
- **Use metrics to optimize content and experience.** Prioritizing content and scope for a large-scale classroom experience has its challenges. However, assessing the performance and knowledge gaps from its new engineers allowed the company to easily prioritize and optimize content. This allowed LinkedIn to invest less time in developing skills that are easily obtained and more time ensuring that the largest gaps are addressed.

Building on the success of Engineering Bootcamp, LinkedIn is looking at how its new engineers are performing within their individual teams to surface any additional resources or programs necessary to increase performance and engagement.





## About Brandon Hall Group

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Brandon Hall Group is a HCM research and advisory services firm that provides insights around key performance areas, including Learning and Development, Talent Management, Leadership Development, Talent Acquisition, and HR/Workforce Management. With more than 10,000 clients globally and more than 20 years of delivering world-class research and advisory services, Brandon Hall Group is focused on developing research that drives performance in emerging and large organizations, and provides strategic insights for executives and practitioners responsible for growth and business results.

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