Effectiveness of current training and development programs for employees capability building as a future opportunity for a sustainable business model

Knut Peters

Dissertation is written under the supervision of

Professor Rute Xavier

Dissertation submitted in partial fulfillment of requirements for the MSc in Strategy & Entrepreneurship, at the Universidade Católica Portuguesa, 3th of January, 2022.

Abstract

Title: Effectiveness of current training and development programs for employees capability building as a future opportunity for a sustainable business model

Author: Knut Peters

There is a substantial gap between the opportunities and the reality of existing human resource applications. The gap is especially prominent for employee capability assessment and development, as individual data-driven learning and development tracks are required. This dissertation conducts qualitative research based on a secondary dataset, holding comments to the working environment of six large technology companies. This is combined with findings of experts interviews to develop and design the value proposition of such a new solution. It then proposes a practical approach and proves the viability of such a model leveraging the service engineering tool "quadromo".

Keywords*: Learning and Development; Capability Management; Skill Gaps; Digitalization.*

Resumo

Título: Eficácia dos actuais programas de formação e desenvolvimento de capacidades para os empregados como uma oportunidade futura para um modelo de negócio sustentável

Autor: Knut Peters

Existe um fosso substancial entre as oportunidades e a realidade das aplicações de recursos humanos existentes. O fosso é especialmente importante para a avaliação e desenvolvimento da capacidade dos funcionários, uma vez que são necessários percursos individuais de aprendizagem e desenvolvimento orientados por dados. Esta dissertação conduz uma investigação qualitativa baseada num conjunto de dados secundários, com comentários sobre o ambiente de trabalho de cinco grandes empresas tecnológicas. Isto é combinado com resultados de entrevistas de peritos para desenvolver e conceber a proposta de valor de uma solução tão nova. Em seguida, propõe uma abordagem prática e prova a viabilidade de tal modelo, alavancando a ferramenta de engenharia de serviços "quadromo".

***Palavras chave**: Aprendizagem e Desenvolvimento; Gestão de Capacidades; Lacunas de Competências; Digitalização.*

List of Content

List of Figures

1. Introduction

1.1. Proposition: individual Training is inevitable to stay competitive

To remain competitive in a rapidly-changing environment, many companies worldwide invest heavily in developing their employees. However, it is difficult for companies to pinpoint precisely what their employees need to learn to be more productive (Topno 2012).

Systematical identification of individual competence gaps seems complicated. The main problem is that tasks and jobs vary significantly between departments and sites. The gap identification starts with defining the needs in structured role profiles. When an organization has defined its core roles and the related competencies, the mapping against the competencies of the job holder can start.

A business process approach must first be established to systematically understand the different skill levels throughout an organization to identify individual competency gaps. Therefore, it is crucial to have a method for competency analysis on an individual level to gain a clear picture of the organizational capabilities as a whole.

One size fits all training is not time adequate anymore (Tambe et al. 2019). With arising technological capabilities, it becomes possible to design a learning and development solution tailored to the individual needs. This would allow managers and human resource experts to understand the individuals skillset and maximize the employees performance with a learning plan tailored to each employees individualized skills, unlike existing platforms, which provide “one-size-fits-all” content or learning paths.

1.2. Product Pitch

Figure 1 describes the process of the idealized product. The proposed product facilitates all steps starting with defining strategic goals and job profiles related to a skill analysis on an individual level. This analysis enables a skill gap assessment. Building on the assessment, any employee should begin to strengthen his / her skills aligned with the business goals. Furthermore, due to the repeating skill analysis and progress tracking, it also becomes possible to measure the impact of the investments made into learning and development on an ongoing basis. The main goal is to facilitate the process by planning learning and development within the company and to identify competencies across departments. As a result of this tool, all employees know what skills they need to acquire to optimize their

performance. At the same time, the tool promotes motivation through a reward system tied to specific job-related goals. Finally, it provides the opportunity for managers and executives to identify areas of their workforce lacking particular skills.

Figure 1: Process based on (Armstrong 2006)

One of the main tasks of the proposed tool is to support business processes by providing the infrastructure to manage and record information most efficiently. It removes the burden of spending time and energy while operating and maintaining the technologies to access data and information. This instrument helps to develop individualized, tracked career plans regularly to create a more positive and engaging work environment. It allows employees to explore different career opportunities and communicate their needs more effectively. It also helps identify areas where the employee is most interested and enthusiastic and would be comfortable and willing to take the initiative.

1.3. Scope and Structure

The starting point of the dissertation is to assess how employees perceive current ongoing programs and whether and how companies regularly evaluate their L&D programs' impact. Following this "As-is" analysis, it will be evaluated how L&D programs can be effectively measured. Furthermore, it will be determined whether creating an individualized and tailored development program can significantly enhance employee productivity. Finally, it will be concluded whether developing a product with such skills can be successfully introduced into the market and operate financially sustainable.

1.4. Problem Statement and Research Questions

The main focus of this dissertation is whether a personalized individual development solution provides a substantial added value for companies' training and development programs. To assess if such a software solution adds value, the status quo and the perception of current solutions are explored. Additionally, it explores how and if current learning and development efforts are assessed and measured in companies. Finally, continuing with answering whether companies can use already accessible data to establish a clearer picture of the need for relevant training that aligns with business needs.

Problem statement:

Effectiveness of current training and development programs for employees capability building as a future opportunity for a sustainable business model.

To address the problems as stated above, the following research questions were phrased:

RQ1: Do employees perceive current training and development programs as valuable?

RQ2: Are companies assessing the impact of training and development initiatives, and is the assessment conducted regularly and effectively?

RQ3: Determine whether a data-driven (individualized) learning & development program may help employees (/companies) become more productive?

RQ4: What is the main difference to existing competitors that can create a market entry strategy that leads to a sustainable business model?

2. Theoretical Discussion

2.1. Employee perception of Learning and Development programs

2.1.1. L&D Definition

Literature does not hold a unified definition of training and development (in this paper it is used synonymously with Learning and Development (L&D)) as the term has developed over the years; however, most definitions aim in a similar direction. Training and development are described as "capital formation" (Mincer 1962), maintaining competencies (Winterton 2007), acquiring knowledge, skills, and attitudes (Cascio and Aguinis 2011), or as "an organization's planned efforts to help employees acquire job-related knowledge, skills, abilities, and behaviors, with the goal of applying these on the job." (Noe 1996) This definition can even be expanded as in the modern world, mental health and work-life balance have more impact, thus making it the task of training and development to care for the overall well-being of the employee (Dimoff et al. 2016).

2.1.2. L&D in the context of performance management

As stated, companies are heavily investing in learning and development measures. To sustain and justify these investments, it is required to track the impact these programs have in the long run. In this sense, performance management techniques have to be deployed, as it is a "continuous process of identifying, measuring, and developing the performance of individuals and teams and aligning performance with the strategic goals of organizations." (Aguinis et al. 2011). Additionally, it is essential to adjust to business measurements and align training and development initiatives with key business goals and KPIs to track the investment on a business case level.

2.1.3. L&D in the context of company culture

(Chatterjee et al. 2018) suggests that the employees perception of the company culture highly relates to the program's overall success and general effort. This goes in line with the findings of (Noe 2010), stating that when employees are gaining skills that will benefit them in their current or future role, they are much more likely to convert the learnings in their day-to-day jobs actively. As authentic leadership and organizational culture are considered the main drivers of employees job satisfaction (Azanza et al. 2013), it can be established that especially leadership development will have an enormous effect on the whole staff.

2.1.4. The relevance of a clear career path in a company

Only 15 percent of global employees are engaged workers, while the other 85 percent are either not engaged or actively disengaged. (Gallup Press 2017) Especially during covid, this was highlighted as most companies moved to home office and started working remotely for the first time. It was found that some US workers took two jobs to double their salary while still working the same amount of hours (40 in total). (Dean 2021) This deeply reflects that employee engagement highly relates to individual performance and company performance. Even before the pandemic, the UK ministry noticed the effect of disengaged employees and its outcomes on a country level. (Motyka 2018)

Business and technical graduates often lack management and soft skills even when they are coming out of university and are supposed to have all the necessary skills for promotion, leading to poor leadership. (Abbasi et al. 2018) This can also be extended beyond graduation as stated by the Peter principle: "in a Hierarchy Every Employee Tends to Rise to His Level of Incompetence." (Peter 1969) Meaning that at some point, every employee will be promoted to a position in which he or she does not excel anymore.

2.2. Theoretical and practical evaluation of L&D Programs

2.2.1. Kirkpatrick model

This part summarizes the Kirkpatrick Model, focusing on evidence of practical applications. The Kirkpatrick model (Figure 2) is a widely accepted model that provides a technique to measure the training programs' effectiveness. It can evaluate whether a training program is likely to meet the needs and requirements of both the organization implementing the training and the staff who will participate.

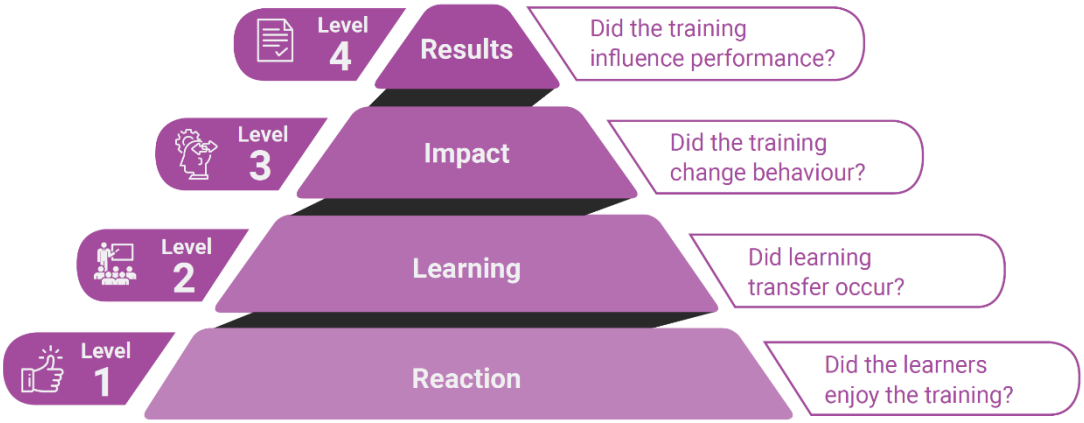


Figure 2: Kirkpatrick Model (Singh 2021) based on (Kirkpatrick and Kirkpatrick 2016)

The model has four hierarchy levels. Feedback from participants is collected during or at the end of the training course and is used for the first level of evaluating a training program. In the second level, the conducted learning is measured based on assessing the level of knowledge after the training. The third level observes how knowledge transfers back to the job on a daily basis. Finally, the fourth level of the model measures the business outcomes of the training program. (Smidt et al. 2009)

2.2.2. Application of the Kirkpatrick model in companies

(Srimannarayana 2011) argues that in India, at the point of the study in 2011, businesses revert "to traditional measures such as collecting feedback from the participants, measuring number of employees trained per year, training costs, training days, and percent of the amount spent on training." Suggesting that businesses only apply level one or two of the model, highlighting that companies do not use impact measures to estimate the bottom-line impact. This is also in line with the limitations highlighted by (Cahapay 2021), who finds a preposition only to use the lower levels of the Kirkpatrick model. Additionally, other crucial aspects that should be evaluated are left out. Often, if the upper levels are used, there are missing links between the levels, so the conclusions drawn are not meaningful.

2.3. Applications of technology and data analytics to improve L&D programs

2.3.1. Leveraging data to empower employees

(Topno 2012) finds that companies need to increase their focus on improving the employees wellbeing and the overall culture of the entire company, work, and management with a strategy tailored to the individual's needs. This research can be combined with (Laat et al. 2020), who establishes that the digitized workplace empowers businesses to obtain and utilize extensive datasets that will help create customized solutions and promote Artificial Intelligence (AI) driven technology for workplace learning analytics and professional development. Therefore a technological and theoretical need is established to improve current learning and development programs with available data. Additionally, firms need to grasp their employees capabilities to manage employees most productively and align them with their business strategy. (Diamantidis and Chatzoglou 2019)

2.3.2. Using technology to improve learning

The literature argues that including media in education leads to a higher engagement of students, which in turn improves the overall satisfaction of each employee (Noe 2010). It is possible to see how seamless and integrated training programs can be designed on the

example of VR technology. For example, pilot training in its initial stages is set exclusively in real-life simulations to achieve quick results that can be implemented. Designing training programs as seamless, intuitive, and personalized is what managers demand and secondly promotes knowledge transfer. At the same time, the reluctance to attend training programs, in general, is reduced. (Maity 2019) These training designs can also reduce the effect of the forgetting curve as technology-driven continuous learning can help employees to remember and transfer knowledge to their jobs instead of only one-time learning and forgetting everything about it. (Bittencourt et al. 2020)

Additionally, a nudging concept can be adapted, creating and fostering an environment and context to help employees make better choices. For example, if kids are presented with fruits before dessert in a canteen, they will choose to live healthier, while car drivers are much more likely to become organ donors when faced with a yes or no question while renewing their license. (Maity 2019) Learning analytics helps students become more aware of their situation and can motivate them in their studying process, thus making them more likely to obtain better grades (Fritz 2017). Organizations are also more and more recognizing the importance of enabling people to learn new expertise at the point of need. Especially as they discover that programs are ineffective if professionals do not use their new knowledge and embed it within their practice. (Littlejohn 2017)

2.4. SaaS Market Entry, Sales and Business Model

2.4.1. Defining SaaS

Software architecture and business model characteristics define the distinctive attributes of Software as a Service (SaaS). Over the last few years, a significant body of literature has described SaaS as a multitenant, virtual, scalable, and configurable application mainly accessed through a web browser. Furthermore, SaaS is understood as a pricing and business model different from traditional licensed software, such as subscription-based or usage-based pricing. However, it was also found that there has not been a study considering the connection between SaaS software's architectural and pricing characteristics.(Laatikainen and Ojala 2014).

2.4.2. SaaS Market entry strategy

In terms of more general entry strategies (Tyrväinen and Selin 2011) defined an approach leveraging marketing means for software service businesses. Sales are supposed to focus on building relationships, seminars, fairs, and other forms of personal communication. Software

product businesses rely on advertising and direct sales, while both use the Internet as a marketing channel. Personal selling, representatives, and value-added resellers are typical sales channels for software service businesses. (Tyrväinen and Selin 2011) also, articulate that the main benefits when purchasing B2B SaaS are the low entry cost and pay-as-you-go pricing.

These approaches are often not viable in a practical implementation, especially in terms of pricing (Saltan and Smolander 2021) found that there are “no trustworthy pricing approaches, frameworks, and guidelines.” The limited scope of methodologies employed and the lack of clarity on the obstacles of designing and implementing pricing in SaaS companies make it difficult to determine if companies are consistently following best practices, let alone following best practices efficiently. One major issue with the current pricing strategies is the lack of understanding of different customer segments actual costs and insight into a SaaS company’s fundamental value proposition. In addition to the lack of a coherent system of SaaS pricing and a variety of unknown factors that influence SaaS pricing, the lack of a practical, usable framework for practitioners poses a significant challenge. One of the most complex obstacles for practitioners is the incompatibility of various SaaS pricing models. In addition, many factors influence SaaS pricing, such as market competition, product features, and variations in SaaS pricing models that make it hard to establish a “one fits all” model. Assuming homogeneity between SaaS, like assumed in multiple papers, does not solve the problem of the practitioners to develop a sound strategy. (Saltan and Smolander 2021)

2.4.3. Service design

This abstract discusses the relevant means to establish a sustainable service design. Two steps are necessary to accomplish this: first, a viable business model must be established. Secondly, it has to be made sure that the organization delivers a unique value as a whole; as such, the business framework Quadromo is applied.

This scalability can also be demonstrated by leveraging the service engineering tool “quadromo”, which combines the four key perspectives of service management: value, process, resources, and the financial perspective. (Becker et al. 2015)

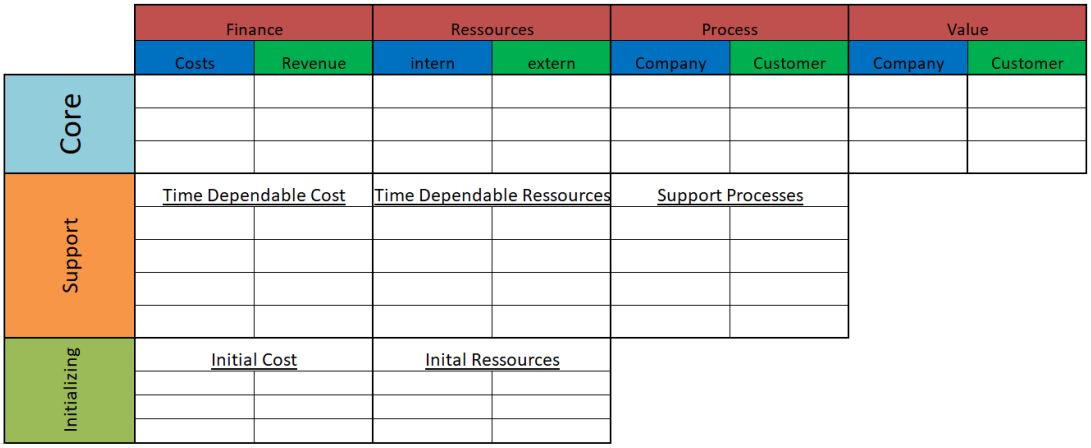


Figure 3: Quadromo Service Engineering based on (Becker et al. 2015)

The quadromo method is used to map precisely one cycle of the service. Thus, it is recommended to break down the service into one run. In addition, this visualization allows determining how many number of cycles are ultimately necessary for the business model to be profitable.

3. Methodology and Data Collection

3.1. Qualitative Research and related Data collection

To answer all the raised research questions requires a qualitative approach. The qualitative research is performed based on a secondary dataset and extended by conducting interviews, where participants subjective experiences are more closely explored. This type of research provides in-depth information about the organization's needs.

The data was raised for six US-based technology companies (Facebook, Amazon, Apple, Netflix, Google, and Microsoft). These technology companies, also referred to as "FAANG," (with the addition of Microsoft), are perceived as leading examples for using data in human resource (HR) practices. In that sense, the dataset shows that if even the employees at these companies are unsatisfied, it is difficult for smaller companies to do better, as they do not possess the resources or knowledge to pursue these topics. (Tambe et al. 2019) As these companies come from the same industry and have a similar technological business model and market cap, they establish a certain comparability standard (Chen 1996). In addition, since it is a very comprehensive dataset, it can assess how employees perceive the company culture, leadership, and most relevant, in this case, training and development efforts.

A total of eight interviews were conducted. The interview partners were directly or indirectly responsible for their company's learning and development solution and incorporated different views from an executive perspective to the executing HR manager. The companies were selected based on the responses on Linkedin of targeted companies. These included a broad range of industries, including cloud technologies, logistics, fast-moving consumer goods, and retailers. In addition, the company size ranges from 15 employees to multinational corporates (more than 75.000 employees). These diverse companies allow for incorporating a broad perspective without having a strong bias toward one sector.

Although this research is based solely on qualitative datasets, this research provides a detailed picture of the situation. In the following, the data collection process is described in more detail. Also, detailed insight into the data is provided.

3.2. Data Collection and description

3.2.1. Secondary data collection

A secondary dataset (Ericsson 2019) is utilized for the first research question to evaluate how employees perceive current training and development programs.

The data was extracted from the website “glassdoor.com", a reliable and objective source for obtaining job satisfaction data (Landers et al. 2019). Ericsson conducted a research talent competition, asking to apply machine learning to assess unstructured feedback for applicable insights, e.g., improvement proposals. The used secondary dataset was raised as part of this competition. While the algorithm created for the Ericsson competition is irrelevant for this analysis, the dataset is deemed relevant. It contains numerous comments about the human resource situation at the companies, including the main points regarding training and development.

A glimpse into the dataset is granted in Figure 15 (Appendix) and in the R script code output in Appendix 5 (cf. pp. 48-52), to understand the available dataset better. Employees rated and commented on the company culture and general job environment. The dataset (cf. Figure 4) contains 59.608 observations covering 16 variables. Each observation includes the place (company/employer) for which the employee works, the location, the date, and the current employment status. The dataset also contains comments regarding positive aspects, negative aspects, the employees advice to management, and a summary comment. These variables are the subject of the conducted qualitative analysis.

There are also six score categories, which will be neglected as categories one to five are unlabeled. The sixth category was established in terms of the research competition and is not part of the original dataset. These categories are disregarded and the analysis focuses on the qualitative comment section.

Not all analyzed ten fields required input. However, most rows are complete with “negatives” (1 missing observation), “positives” (0 missing observation), and the “summary” comment (103 missing observations). The “advice_to_mgmt” comment misses 25796 observations, so only the 33.812 comments in this section can be used for analysis.

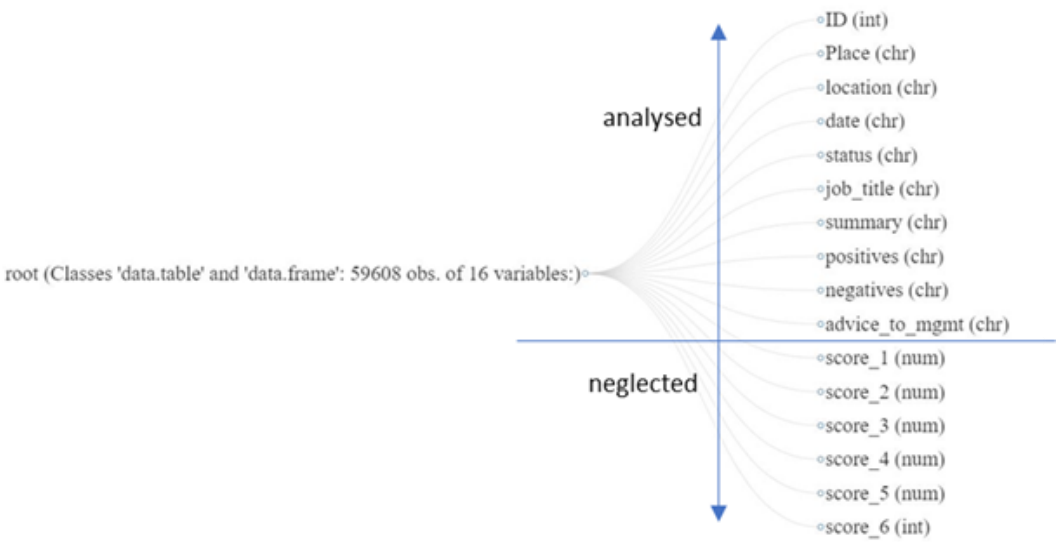


Figure 4: (Ericsson 2019): Dataset Structure

The dataset contains reviews from April 1st, 2009, to September 9th, 2018. Figure 5 shows that most reviews are from 2015 to 2018.

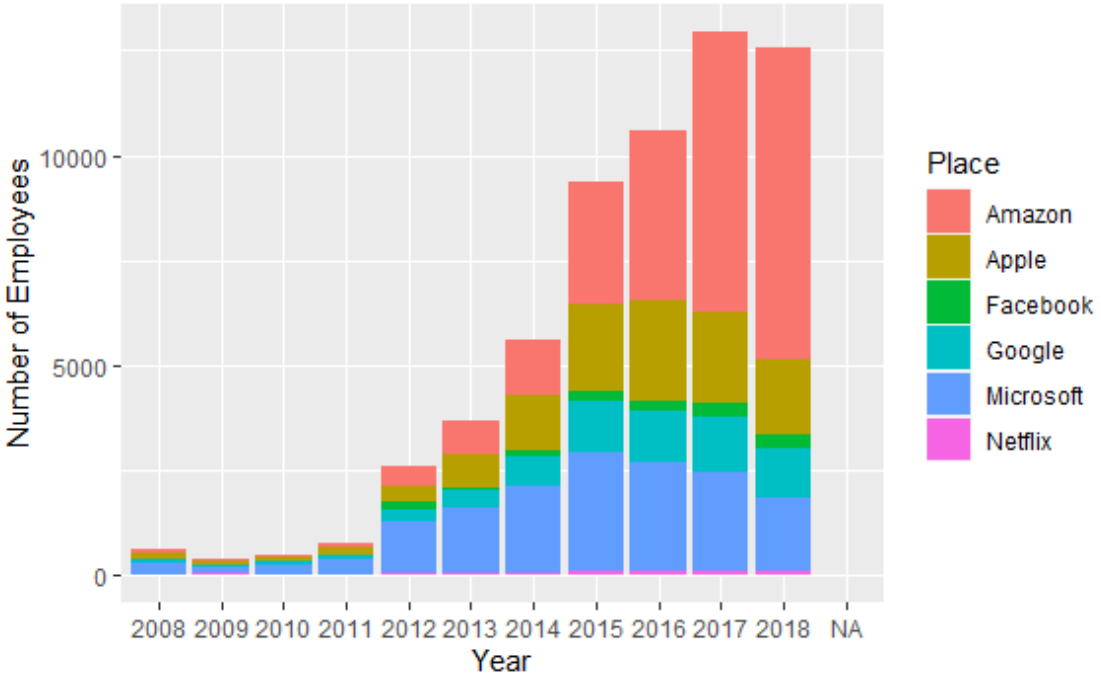


Figure 5: (Ericsson 2019) adapted: Data Distribution Over Time

As seen in Figure 6, the majority of the reviews are coming from employees while they were at the company. The figure also shows that the dataset focuses on six US-based technology companies (Amazon, Facebook, Apple, Netflix, Google, and Microsoft). With 40.2%, Amazon employees left the most reviews. However, this also means that most conclusions that are drawn are related to Amazon(40.2%), Microsoft (25.9%), Apple (19.2%) and Google

(11%), but much less conclusive for Netflix or Facebook, which combined only makeup around 3,7% of the reviews.

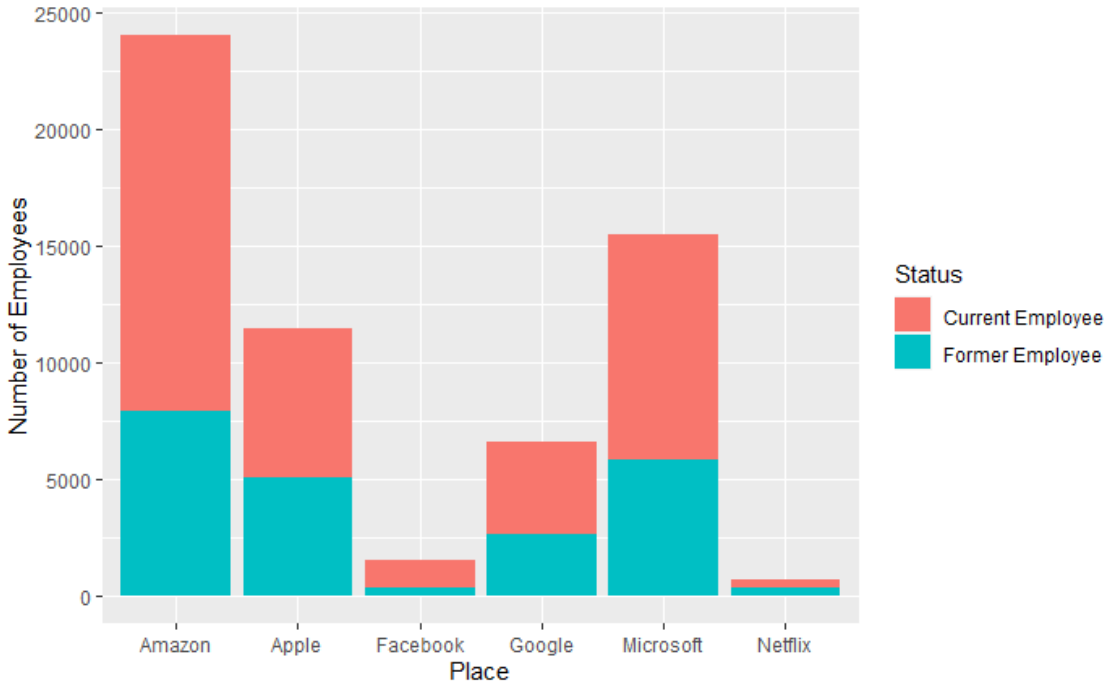


Figure 6: (Ericsson 2019) adapted: Place and Employee Status

3.2.2. Primary data collection

Primary data was collected with an interview process for the second and third research questions. To evaluate how and if companies assess learning and development initiatives properly and determine whether a data-driven solution could help companies become more productive.

To refine the interview (Appendix: Interview Script), the Interview Protocol Refinement (IPR) was used. The Interview Protocol Framework comprises four phases: The first phase of the review process ensures that the questionnaire aligns with the research questions. In the second step, an inquiry-based conversation is constructed. The third stage is to gather feedback on the interview protocol. The last step in the refinement process is to pilot the interview protocol. (Castillo-Montoya 2016)

The main goal was to gather primary data with expert interviews. The approach was to ask the target group on LinkedIn for a short (twenty to thirty-minute) interview. The focus of the interviews was senior managers and human resource professionals. The interviews allowed a deeper insight as to how and whether the impact of training and development programs are assessed in companies at this moment. The interviews focused on what companies measure to

analyze their training and development programs, the conclusions they draw from these analyses, and the implications, i.e., what action follows from specific numbers.

To answer the third research question, whether a data-driven learning and development solution helps employees and companies become more productive. The interviews also determine what kind of training and development solution the company is currently using, the main positive and negative things about the software, as well as possible improvements and a net promoter scale to see whether they are satisfied with their current software or if they see that change is necessary. Finally, the last questions of the interview were directed towards the topic of trends in human resources and whether they think that an individualized training and development solution could improve or add on to their existing solution.

3.3. Methodology

3.3.1. Preparing the dataset

Figure 7 visualizes how the "glassdoor" dataset is prepared and cleaned for the analysis.

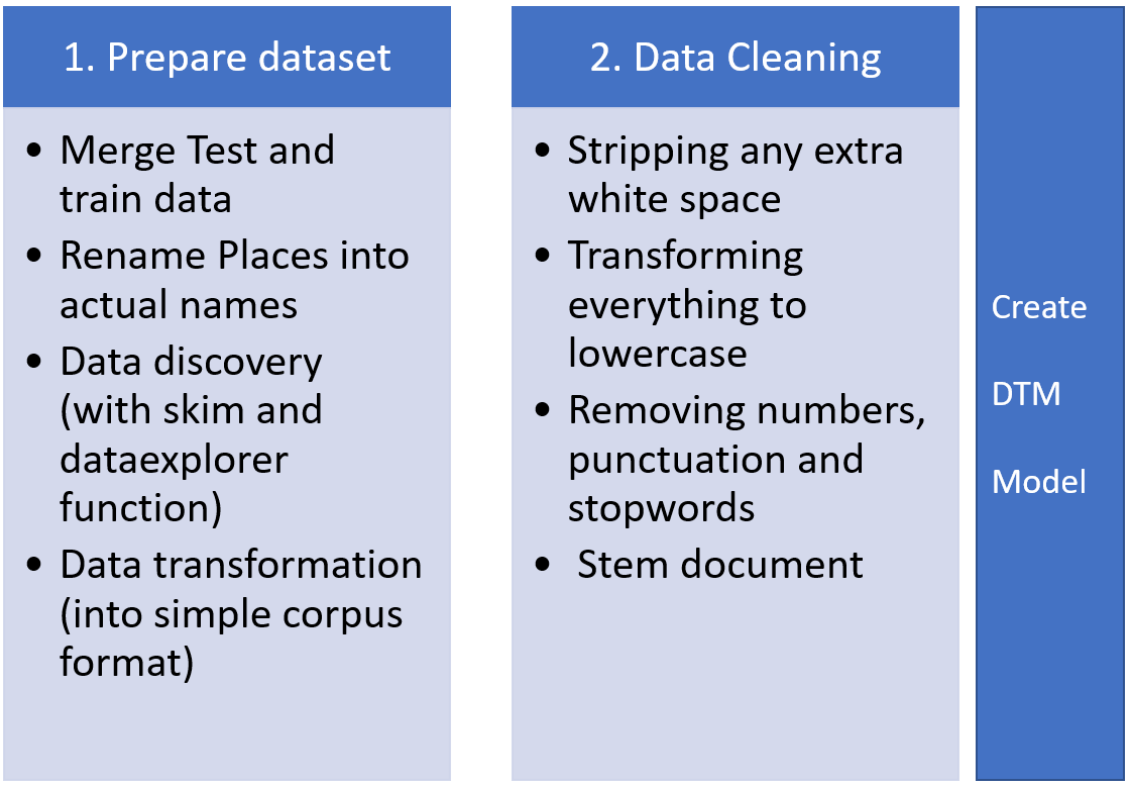


Figure 7: Preparing the Dataset based on (Harrison and Sidey-Gibbons 2021)

Initially, the dataset was broken down into a test and training dataset to enable research based on machine learning. As this research does not target machine learning, the first step of data cleaning was to merge the test and training dataset to include all 59.608 observations. To separate the companies properly, the dummy names were replaced with the actual name of the

employer. The skim and dataexplorer function in R Script were used to gain an overview of the dataset. Next, the data was transformed into a simple corpus format, allowing text content analysis. The simple corpus was used to clean the comments properly for further analysis. This included removing extra white space, transferring the text body to lowercase, and removing numbers, punctuation, and English stop words. Additionally, before creating the document term matrix (DTM) model, the document was stemmed (to the word stem). The final result of the cleaned dataset is the DTM, containing a matrix with the frequency of each term.

3.3.2. Thematic Research and Sentiment analysis

The research utilizes the approach of thematic research based on a hybrid thematic analysis, combining an inductive and deductive approach (cf. Figure 8). The main reason for selecting this analysis is that it is designed to uncover people's personal, subjective experiences, views, and opinions. (Braun and Clarke 2006) The research will be applied to the dataset using the software R script (RStudio 2021), combined with a manual analysis of the conducted interviews. Leveraging the perspective of an extensive dataset with personal input on a qualitative basis will allow the reader to gain a clear picture of companies' current situation.

There are six steps in thematic research: familiarization, [coding], generating themes, reviewing themes, and writing up / summarizing results. This will establish patterns in the dataset that can base conclusions. (Braun and Clarke 2006) Leading to a result that identifies recurring patterns as overachieving statements (Lochmiller 2021). This approach is used to analyze both the "glassdoor" dataset and the results from the interviews.

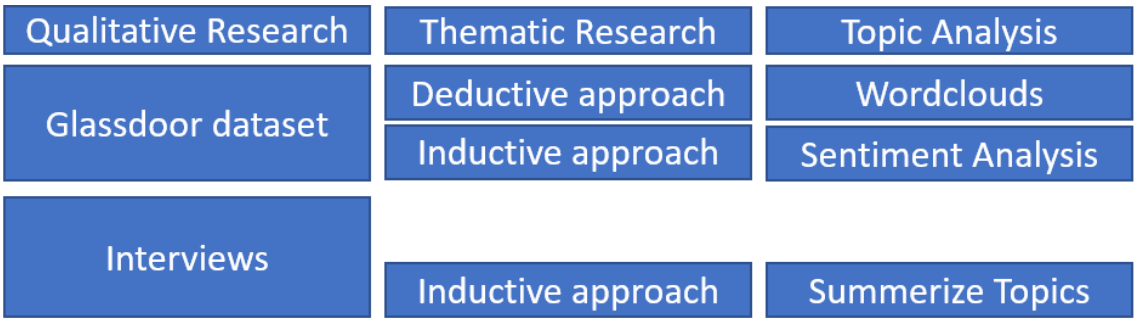


Figure 8: Hybrid Thematic Research based on (Fereday and Muir-Cochrane 2006)

The glassdoor dataset will also be subject to sentiment analysis. Sentiment analysis studies people's opinions, evaluations, appraisals, attitudes, and emotions towards entities such as products, services, and organizations. It is commonly used in customer service and marketing. Businesses and organizations always want to find consumer or public opinions

about their products and services as these are central to the customer's purchasing decision. Formerly, when a business required public or consumer opinions, surveys and focus groups were conducted. Considering the number of online reviews, blogs, and forum websites available, there is an increasing interest in leveraging this data to make informed decisions. However, finding and monitoring these websites and extracting relevant information remains a challenging task due to the large amounts of data. Any website usually includes many opinion texts, which are not easy to decipher as they are included in lengthy blogs and forum posts. The average person is overwhelmed in identifying relevant pages and extracting and summarizing the opinions they contain; therefore, sentiment analysis must be automated. (Liu 2012) This analysis is conducted with the sentiment package of R Script, assigning each word a positive, negative or neutral value based on a Harvard dictionary.

4. Analysis and Results

4.1. How do employees perceive current training and development programs?

4.1.1. Qualitative analysis

The used dataset consists of collected data from the job review platform “glassdoor.com” and is analyzed using R-Script.

To reiterate, there are six steps in thematic research: familiarization, coding, generating themes, reviewing themes, and summarizing the results.

The dataset is used because it contains balanced views of the employee towards the employer (including attitudes towards training and development practices), which are collected anonymously (Landers et al. 2019).

The main analyzed attributes are the place (/ the employer), summary, advice to Management, positive and negative comments. To identify generic themes, word clouds (Appendix 3) are generated, one for each category (negative comments, positive comments, advice to management, and summary). In the second step, sentiment analysis is conducted to get insights into employees likes and dislikes.

Word clouds provide a rapid method of understanding what is discussed in a document by identifying the most frequently occurring terms. In addition, they offer a useful thematic analysis model because they allow multiple dataset perspectives to examine and compare the structure and relationships. (Chandrasegaran et al. 2017)

The main topics in each field are determined from word clouds, as shown for the Advice to Management in figure 9, respectively, for all categories.

The first prominent topic is “manag”: It comes into perspective as it is one of the main words in the comments of advice to management and negative comments.

Figure 9: Wordcloud Advice to Management

In the context of "manag", management and leadership are reoccurring topics, especially in the context of promotion, career advancement, and planning. Especially it is criticized that people are not promoted because "they know how to lead" but because they are bright and were successful in previous roles. The second issue with promotion is that it is based on performance reviews which are partly subject to office politics. For example, one leader mentioned that he was "forced to give good employees bad overall ratings because of politics and stack ranking".

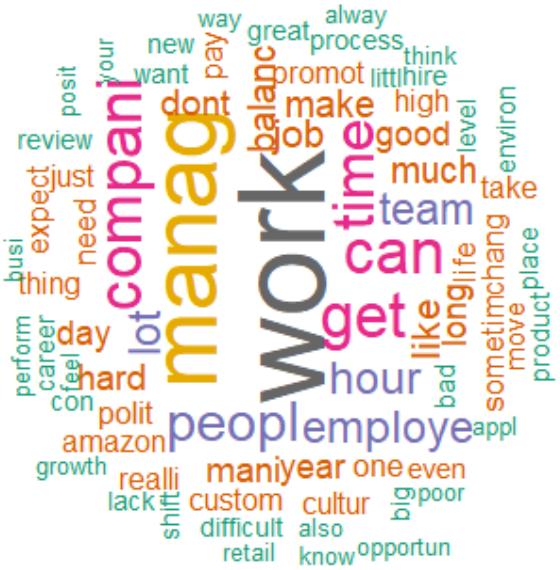


Figure 10: Negative Comments

As derived from the extended feedback, "manag" is linked to comments on company culture. Feedback was stated that work is required on weekends and vacations, and no work-life balance exists. One employee mentioned that "managers [are] straight-up cussing out their employees and intimidating/scaring their employees into compliance". Reoccurring statements highlighted that there is no "training, management training, or development" after an initial training period in the first three months.

The next topic analyzed and frequently found in the text body of advice, and negative is "get". In the context of "get", employees criticize that there is not enough management support for being promoted. Overall, leadership is perceived as lacking emotional intelligence. Financial benefits are criticized as they are linked to conditions (e.g., relocation bonus pay-bay with contract time < 2 years). Additionally, available time for training was seen as too limited.

The words "time" and "hour" are also reoccurring in the advice comments to management and negative. Reviewing the related comments, there are three main topics in this context: compensation, quality of the working environment, and lack of time to do the main job properly.

Furthermore, when assessing the topics of "employee" and "people", the caliber of people managers is commented on. Advice is to raise the bar when employing new managers (quality instead of quantity) and to review their attrition more carefully.

In contrast, when reviewing the positive comments, the topics “work,” “opportunity,” and “learn” come into the light. Digging into the verbatims, the topic of career growth is recurringly mentioned in combination with the multiple opportunities to learn new skills in a concise period. Additionally, the importance of working on “world-changing projects” with the “smartest people” in the world is mentioned. One reviewer notes that anyone who stayed longer than two years is competent and motivated or would not have survived. Another reviewer adds that the company's name is a good name in your CV for any further external applications.

Figure 11:Wordcloud Positive Comments

4.1.2. Deductive Analysis

This part describes the conducted thematic analysis in the context of training and development. The first step in the deductive analysis is to identify relevant statements related to training and development. This can be achieved by examining the word clouds for keywords related to training and development.

Keywords differ depending on the type of comments. For the negative comments, “growth”, “move”, and “level” were found as relevant. In the positive dataset, the relevant keywords are “benefit”, “opportunity”, “learn”, “career”, “growth”, and “develop”. In the section, advice to management: “Promote”, “train”, “develop”, “level”, “talent”, “leadership”, “opportunity” are considered. And the summary section, the keywords “learn”, “opportunity”, “develop” and “grow” are relevant.

When reviewing the verbatims related to the negative comment keywords, career development and promotion is the central theme. The feedback that the company became too big and slow over the years of accelerating growth was mentioned for all six technology companies. Additionally, management seems to prefer to hire senior managers from the outside. This makes it hard to get promoted. It is an issue for employees because there is no evident career growth or promotion path for talented employees. According to their employees, especially Amazon and Netflix have very high attrition and have difficulties

keeping their talent in the company. Only Microsoft seems to be the exception within these six companies, as in the positive comments are multiple mentions of the excellent career opportunities. Furthermore, the positive section highlights that a lot of the learning process comes from learning by doing and that this can lead to fast personal growth in a short amount of time, as the projects that are worked on are impactful and often moonshot projects.

The summary section brings all of these views together as it is stated that these companies are generally a "good place to work", and there certainly are development opportunities. However, in an amount that should concern the companies, it is mentioned in the advice to management to "develop a better training system as well as clearer expectations which will enable people to see the path to grow[th] and promot[ion]." The companies are also advised that they should not devalue the already established internal talent just because they can attract any external talent (to focus on internal promotion). A final remark here is to incorporate the views of people who are leaving instead of just listening to people who stay with the company.

4.1.3. Sentiment analysis

The analysis uses the Harvard sentiment classification to determine the positivity or negativity of a statement summarized in a sentiment score. The figures below show the development of the sentiment scores over the years, for positive and negative comment categories respectively. The scale ranges from minus one (very negative comment) to one (very positive comment) and reflects the overall emotions of a review.

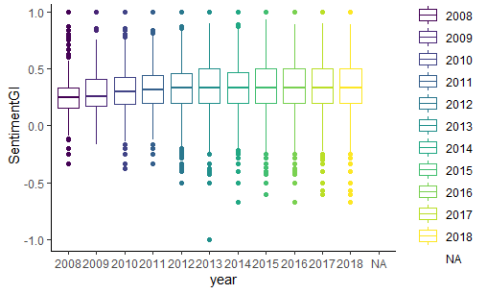


Figure 12: Sentiment Positive Comments

Figure 13: Sentiment Negative Comments

Figure 12 shows that the median is increasing over time. It also shows that the variance increases, as mentioned comments got more extreme. The negative sentiment score decrease over time, also getting more extreme.

A further sentiment analysis (cf. Figure 17) illustrates that there is no significant difference in sentiment score between the comments provided by current or former employees.

The extreme comments are examined in the next step to determine common topics. The results of this analysis confirmed the findings as already summarized in the topic analysis.

What the sentiment analysis shows is the spread of opinions. It illustrates that in the same company employees are very satisfied if their personal environment with Line Manager and Team is functioning.

4.1.4. Summary

While the comments were very generic, some core themes are relevant in the context of training and development. Focusing first on development, growth opportunities, and the lack of a proper career plan needs focus. Hiring too many people and not finding the best-suited role is a common problem, leading to a high attrition rate. The other reason for leaving the company is the quality of management. As it is often stated,
“people don't leave companies they leave managers”(Lipman 2015).

Following the above, future features of the training and development tool should support competence development for people Management and Leadership. Additionally, it could include possibilities to establish a key performance indicator for attrition by manager. This would allow combining high potentials with best people managers increasing the likelihood of long-term company commitment. The tool should also facilitate the definition of transparent promotion criteria, supporting the development of career paths for any employee.

4.2. Generated Topics from the conducted Interviews

4.2.1. Conducted Interviews

As stated above, eight interviews were conducted. Interview partners were directly or indirectly responsible for their company's learning and development solution and incorporated different views from an executive perspective to the executing HR manager.

4.2.1.1. Standardized L&D

Interviews surfaced that 50-70% of the L&D content is similar across companies. The highest overlay is quality and safety procedures, with high standardization and high alignment to business goals. For example, multiple respondents mentioned the onboarding training to ensure adherence to quality and safety procedures, avoiding, e.g., malicious products being shipped to the customer. Mentioned pain points are the remaining training content. Here the training content has to be created for the individual employee to complete a specific task. This

requires a lot of effort and time; therefore, business leaders highlighted the need for a standardized process or a more accessible alternative.

4.2.1.2. Training Content production and distribution

The standardization effort also targets how the training content is produced and distributed to the employee. In general, the preferred format is video content, as it is seen as more effective than pictures and or texts. During onboarding, new hires can conduct their training independently without requiring another employee's time.

Another highlighted issue is content production. It was stated that professional content production creates a barrier for employees who discovered a problem and could quickly produce a video to share how it is fixed with fellow employees. In this sense, one of the interviewees suggested incentivizing content production and creating an in-house platform like YouTube to share knowledge across borders in an organization. Training content production should be designed with the lowest barrier to enter and access training content. This includes content creation in the local language considering cultural differences.

4.2.1.3. Practical Evaluation of Training and development initiatives

The interviews established that evaluations of training efforts are done with a feedback survey in most cases. This survey is raised after the conducted training. There are only a few additional follow-ups to evaluate the long-term impact.

However, there are exceptions; one company implemented a system to monitor capabilities continuously. At first, role profiles are defined, including the tasks to be performed and the required skillset. Moving on to classify each employee with a four-level system: the first-level employee needs to learn the skill, and the second-level system can perform the task with help. While an employee on the third level can perform the job independently, and an employee on the fourth level can teach the task. An alternate evaluation form conducted by a different company was 360-degree assessments paired with self-assessment. These were heavily used in leadership development, so it always matters which area (business or technical) should be developed when choosing an evaluation method.

4.2.1.4. Training to minimize attrition

Another critical issue in training and development that was coming up frequently was training to minimize attrition. As employees faster move roles or exit the company, capabilities are often just established and immediately lost again. Therefore, one of the main challenges is

determining why employees leave and respectively how long they will stay in the role. As also stated in the conclusions above, one mentioned approach is to counter the fluctuation of high potentials by pairing them with the best people manager in the company (determined by individual team fluctuation and performance on projects). This approach targets that talent is not lost to other companies and fosters in-house talent development.

4.2.1.5. Effort to establish a centralized L&D function

Smaller companies (below 50 employees) recurringly stated that scale is required to establish a centralized learning and development initiative. However, there are not enough resources or organizational capability for fewer employees to implement such a program and monitor it on an ongoing basis.

4.2.1.6. Strategic alignment

In several interviews, it was stated that strategic goals are not directly aligned with Learning and development initiatives. One of the main reasons is that strategic goals are defined on a high level and not broken down into actionable smart goals. For example, retaining talent is a key strategic objective of the considered companies in most cases. However, while it is simple to track attrition, it is harder to track and understand the reasons why an employee decided to change companies. Accordingly, countermeasures to address root causes for attrition are hard to define.

4.2.1.7. Current solutions

Various solutions exist to manage the core human resource functions. Particular applications for training and development (besides an in-house academy that centralized some training) are rare. Especially the lack of tools for competency analysis was highlighted. Existing competence tools were developed in-house and are primarily based on excel sheets.

4.2.2. Conclusion

There are a number of significant findings from the conducted interviews. Most relevant is that there is no product on the market for a competency analysis. Any future tool should consider the complexity and required interaction with the company as competence analysis is an individual task and complex to standardize.

A future tool should also address content production. Specifically, training creation from employees to employees should be considered. The software tool could facilitate the process of creation and translation in any required language.

For smaller companies, a service function could be developed. Modules as mentioned above (employees create training for employees) could be a starting point without major investment in centralized functions.

The tool should also offer training evaluation possibilities. Following the responses, evaluation needs to be tailored to the type of training. The interviews described a 4 step competence assessment as an excellent model to link with the Kirkpatrick model for technical training. The tool should also include options for leadership development, which are a combination of 360 feedback and self-assessment.

5. General Discussion

5.1. Identified Improvement Opportunities

The conducted analysis shows that there are significant improvement opportunities. Starting with the first research question on the value employees see in L&D, it is worth considering the link between company culture and training and development. The analysis surfaced the lack of development perceived by employees. Improvement activities should target the creation of clear career paths, transparency in performance reviews, and developments closely linked to promotions. The openness and transparency of those aspects usually go hand in hand with an engaging and nurturing company culture.

Another criticized aspect is that there is rarely "training, management training, or development" (Ericsson 2019) after an initial training period in the first three months. However, this statement has to be contrasted by positive reviews that point out the growth opportunities at the different companies. The restricted training access may depend on the department or the manager of the employees.

5.2. Training evaluation practices at companies

From a theoretical perspective, most companies are not following the Kirkpatrick model above level two (Chatterjee et al. 2018). The conducted interviews mostly confirm these findings. However, some exceptions go up to the fourth level. It is not always easy to distinguish between vision and reality when interviewing HR practitioners, especially with upper management.

All companies in the interviews stated that they were conducting evaluations of learning and development initiatives right after the training. This evaluates if the participants liked the training, which equals the first level of the Kirkpatrick model. The execution of the second-level feedback is difficult to check from a human resource perspective. It is often the line manager's responsibility to verify whether the training was practical or not. This usually occurs on a case-by-case basis, which human resources rarely track nor verify.

As mentioned before, some evaluations go beyond this level. These are mostly not company-wide but conducted for specific departments or sections. For example, in one case, a leadership consultancy conducts the training: the approach here is to conduct an analysis before the program (self-analysis and 360-degree analysis) to assess the current state of the employee. The employee then completes a six-month development program, after which the

analysis is repeated to determine in what ways the employee has improved. However, this is done only before and after the program and not on an ongoing basis. Execution of Level four validation was not mentioned. Linking training results with business objectives is a clear opportunity.

The only exception was derived in two large multinational corporations linked to the development of employees in the operations and manufacturing department. They categorized each employee into four levels. Level one needs to learn the skill that is required for the task. In contrast, employees on the second level are able to perform the assignment under supervision. On the third level, employees can perform the job independently. While going one level up, the employees can teach the tasks. This system is closely tracking the capabilities that are existent in the organization while at the same time developing the skill of the employees on an individual level. As manufacturing and operations are closely tied to throughput and time as operational performance, this system can capture all levels of the Kirkpatrick system (cf. Figure 2). These performance indicators can be monitored and compared to the developed capabilities. The company claims to tie capabilities to promotions to establish a clear career path.

5.3. Value added by a data-driven (individualized) learning & development software tools

(Laat et al. 2020) establish that current software tools should incorporate big data and modern technologies. This would allow individualizing learning and development efforts, creating a more effective and efficient learning experience. In the eight conducted interviews, this statement was strongly supported. All respondents stated that they see the benefit of such a new solution. The new solution should primarily consolidate each individual employee's exact training and development requirements. As existing competencies are unknown, it is impossible to determine how to close future skill gaps. It is essential to track what skills are required in a fast-moving environment where employees move jobs and companies fast.

Despite the clearly identified need, the design of such a solution comes with a significant workload for any organization. To generate the required information take time and business commitment. Equally maintaining the data at high quality needs remaining effort. The software design is estimated as comparable low effort compared to the generation of the individual training and development paths.

5.4. Business model

The figure below describes how a financial plan for such a software tool could look like. The analysis is based on the service design tool “quadromo”, a tool designed to develop innovative service based business models.

	Finance		Ressources		Process		Value	
	Cost	Revenue	intern	extern	Company	Customer	Company	Customer
Core	10000		Personell ((for two employees)		Sales & Marketing		Create sustainable business case	Clear Promotion Path for employees
		Monthly suscription fee			Customization for customer	Buy Software		
			Personell		Consult for Implementation			
				IT-Infrastructure	Self service Plattform			Link to strategic goals
						Maintain Software		
		Refer external Coaches				Use Training program		
			Programming		Extension with new features		Competitive Advantage through unique solution not yet exsitant	efficient + effective Training and Development
Support	Time Dependent Cost		Time Dependent Ressources		Supportprocess			
	750			IT Plattform	IT Support			
	1000		Personell					
Initilization	One time cost		One time ressources				Finance	Total
	50000		Software programming				Cost (once)	50000
							Cost / Year	141000
							Req revenue	191000

Figure 14: Business Case based on Service Engineering (Becker et al. 2015)

At first, the value for the customer is established, enabling an efficient and effective training and development program at the company. This includes a capability tracking and succession management feature. The software is also able to link learning and development to strategic goals. One product iteration is displayed in the process section, starting from the sale to the after-sale support. In the next step, the resources and related costs are established. There are two main cost drivers, Personnel to sell the software and consultants that lead the implementation process (for the first year, these are estimated to equal 10.000 Euro per month). Also considered are the costs for the IT Platform and the cost to develop new features. These are estimated to be 1750 per month. Additionally, a one-time fee of 50.000 Euros is required to develop the software initially. This leads to a total cost estimation of 191000 Euros to build the software and launch a go-to-market strategy for the first year. Therefore, from a feasibility perspective, it is most likely to develop the Software with a company (e.g., in a joint venture) and then scale it to reach profitability.

6. Conclusion

Companies are constantly adapting to changing competitive markets demands. As in recent years, the requirements for the workforce have been shifting from traditional to digital skill sets. Accordingly employees competency assessment and tracking are becoming more and more important. The conducted analysis revealed that a product for employees competency assessment and tracking is not broadly used.

When organizations are not focused on their employees, they are missing out on opportunities where their employees could advance and grow. A tool like this would help companies to facilitate on the development and growth opportunities of their employees. The tool would also help companies to keep their employees engaged with the company's goals leading keeping them with the company longer. Additional it would enable tracking and improving the quality of management, e.g. by creating a key performance indicator for attrition by manager. This would allow companies to combine high potentials with best people managers increasing the likelihood of long-term company commitment. This would also result in higher retention rates, as workers would be happier with the company and would stay longer.

Overall the need of such a product has been demonstrated. As the final product will contain several modules the development approach and priority will depend on funding approach. There are two obvious key options to develop the software. First option is to establish a joint venture to acquire the funds from an established company that would also act as the first pilot customer. Alternatively the product development could target to deploy a minimum viable product suitable for all companies. This first solution should address competence development for people Management and Leadership. This focus allows to minimize the software development cost to quickly introduce a product into the market, generating first revenues. Based on this first product inviting customers feed-back the development of the next modules will be initiated.

7. Limitations and Future Research

Several limitations have to be considered. At first, the choice of the dataset is limiting as only technology companies were included in this assessment. Extending this research into other industries could yield exciting results.

The thematic analysis based on the word clouds might also introduce a bias. The comments were examined one by one following the occurrence of the identified topics. As it is a very comprehensive dataset, the mass of data might have led to an oversimplification in some aspects.

The sentiment analysis can also be seen as limiting. It is not always accurate, as it is dependent on single words, which means that the context of a statement is potentially not displayed correctly, e.g., sarcasm cannot be adequately reflected.

With eight conducted interviews the concluded results can only partly reflect how the industry performs and evaluates learning and development. Regarding the method, it has to be questioned whether the interviewer introduced a bias as the script was adapted to each respondent. Additionally, facts and vision were partly hard to distinguish, which also adds a limiting component to the interviews.

Before launching any related product, it is important to conduct a detailed customer segmentation study. This will increase the likelihood of a successful launch.

Additionally, further research is required to define how individual skills can be assessed appropriately. In this study the industry best practice has been used as role model without any investigation if better methods are existing. Furthermore, future research can be conducted on how specific artificial intelligence applications can be used in human resources to leverage existing data. This would allow companies to increase the understanding of each individual employee needs and develop custom tailored support.

References

Abbasi, Farhad Khurshid, Amjad Ali, and Naila Bibi. 2018. Analysis of skill gap for business graduates: managerial perspective from banking industry. *Education + Training* 60 (4): 354–367. doi: 10.1108/ET-08-2017-0120.

Aguinis, Herman, Harry Joo, and Ryan K. Gottfredson. 2011. Why we hate performance management: And why we should love it. *Business horizons* (54-6): 503–507.

Armstrong, Michael. 2006. *A handbook of human resource management practice*, 10th edn. London: Kogan Page.

Azanza, Garazi, Juan Antonio Moriano, and Fernando Molero. 2013. Authentic leadership and organizational culture as drivers of employees' job satisfaction. *Revista de Psicología del Trabajo y de las Organizaciones* 29 (2): 45–50. doi: 10.5093/tr2013a7.

Becker, Jörg, Björn Niehaves, Jens Pöppelbuß, Kevin Ortbach, Ralf Plattfaut, Matthias Voigt, and Andrea Malsbender. 2015. *Service Design.* Berlin, Heidelberg: Springer Berlin Heidelberg.

Bittencourt, Ig Ibert, Mutlu Cukurova, Kasia Muldner, Rose Luckin, and Eva Millán (eds.). 2020. *Artificial Intelligence in Education.* Cham: Springer International Publishing.

Braun, Virginia, and Victoria Clarke. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology* 3 (2): 77–101. doi: 10.1191/1478088706qp063oa.

Cahapay, Michael. 2021. Kirkpatrick Model: Its Limitations as Used in Higher Education Evaluation. *International Journal of Assessment Tools in Education* 8 (1): 135–144. doi: 10.21449/ijate.856143.

Cascio, Wayne F., and Herman Aguinis. 2011. *Applied psychology in human resource management*, 7th edn. Boston, Mass., Munich: Pearson.

Castillo-Montoya, Milagros. 2016. Preparing for Interview Research: The Interview Protocol Refinement Framework. *The Qualitative Report.* doi: 10.46743/2160-3715/2016.2337.

Chandrasegaran, Senthil, Sriram Karthik Badam, Lorraine Kisselburgh, Karthik Ramani, and Niklas Elmqvist. 2017. Integrating Visual Analytics Support for Grounded Theory Practice in Qualitative Text Analysis. *Computer Graphics Forum* 36 (3): 201–212. doi: 10.1111/cgf.13180.

Chatterjee, Aindrila, Arun Pereira, and Reid Bates. 2018. Impact of individual perception of organizational culture on the learning transfer environment. *International Journal of Training and Development* 22 (1): 15–33. doi: 10.1111/ijtd.12116.
Chen, Ming-Jer. 1996. Competitor Analysis and Interfirm Rivalry: Toward a Theoretical Integration. *The Academy of Management Review* 21 (1): 100. doi: 10.2307/258631.
Dean, Grace. 2021. Some white-collar workers are secretly balancing 2 full-time jobs and earning up to $600,000, a report says. They drop in and out of multiple meetings to avoid getting caught. https://www.businessinsider.com/second-jobs-secret-salary-income-money-remote-work-overemployed-2021-8. Accessed 18 October 2021.
Diamantidis, Anastasios D., and Prodromos Chatzoglou. 2019. Factors affecting employee performance: an empirical approach. *International Journal of Productivity and Performance Management* 68 (1): 171–193. doi: 10.1108/IJPPM-01-2018-0012.
Dimoff, Jennifer K., E. Kevin Kelloway, and Matthew D. Burnstein. 2016. Mental health awareness training (MHAT): The development and evaluation of an intervention for workplace leaders. *International Journal of Stress Management* 23 (2): 167–189. doi: 10.1037/a0039479.
Ericsson. 2019. Ericsson Foresight ML Hiring Challenge'19 [Dataset]. *Glassdoor*.
Fereday, Jennifer, and Eimear Muir-Cochrane. 2006. Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. *International Journal of Qualitative Methods* 5 (1): 80–92. doi: 10.1177/160940690600500107.
Fritz, John. 2017. Using Analytics to Nudge Student Responsibility for Learning. *New Directions for Higher Education* 2017 (179): 65–75. doi: 10.1002/he.20244.
Gallup Press. 2017. *State of the global workplace.* New York NY: Gallup Press.
Harrison, Conrad J., and Chris J. Sidey-Gibbons. 2021. Machine learning in medicine: a practical introduction to natural language processing. *BMC medical research methodology* 21 (1): 158. doi: 10.1186/s12874-021-01347-1.
Kirkpatrick, James D., and Wendy Kayser Kirkpatrick. 2016. *Kirkpatrick's four levels of training evaluation.* Alexandria, VA: ATD Press.
Laat, Maarten de, Srecko Joksimovic, and Dirk Ifenthaler. 2020. Artificial intelligence, real-time feedback and workplace learning analytics to support in situ complex problem-solving: a commentary. *The International Journal of Information and Learning Technology* 37 (5): 267–277. doi: 10.1108/IJILT-03-2020-0026.

Laatikainen, Gabriella, and Arto Ojala. 2014. SaaS Architecture and Pricing Models. In *2014 IEEE International Conference on Services Computing (SCC 2014): Anchorage, Alaska, USA, 27 June - 2 July 2014 ; [proceedings*, ed. Elena Ferrari, 597–604. Piscataway, NJ: IEEE.

Landers, Richard, Robert Brusso, and Elena Auer. 2019. Crowdsourcing Job Satisfaction Data: Examining the Construct Validity of Glassdoor.com Ratings. *Personnel Assessment and Decisions* 5 (3). doi: 10.25035/pad.2019.03.006.

Lipman, Victor. 2015. *The Type B Manager: Leading Successfully in a Type a World.* East Rutherford: Penguin Publishing Group.

Littlejohn, Allison. 2017. Learning and Work: Professional Learning Analytics. In *Handbook of Learning Analytics*, ed. Charles Lang, George Siemens, Alyssa Wise and Dragan Gasevic, 269–277. Society for Learning Analytics Research (SoLAR).

Liu, Bing. 2012. *Synthesis Lectures on Human Language Technologies: Sentiment Analysis and Opinion Mining.* San Rafael: Morgan & Claypool Publishers.

Lochmiller, Chad. 2021. Conducting Thematic Analysis with Qualitative Data. *The Qualitative Report.* doi: 10.46743/2160-3715/2021.5008.

Maity, Souvik. 2019. Identifying opportunities for artificial intelligence in the evolution of training and development practices. *Journal of Management Development* (38): 651–663. doi: 10.1108/JMD-03-2019-0069.

Mincer, Jacob. 1962. On-the-Job Training: Costs, Returns, and Some Implications. *Journal of Political Economy* 70 (5, Part 2): 50–79. doi: 10.1086/258725.

Motyka, Błażej. 2018. Employee engagement and performance: a systematic literature review. *International Journal of Management and Economics* 54 (3): 227–244. doi: 10.2478/ijme-2018-0018.

Noe, Raymond A. 1996. Is career management related to employee development and performance? *Journal of Organizational Behavior* 17 (2): 119–133. doi: 10.1002/(SICI)1099-1379(199603)17:2%3C119:AID-JOB736%3E3.0.CO;2-O.

Noe, Raymond A. 2010. *Employee training and development*, 5th edn. New York, NY: McGraw-Hill/Irwin.

Peter, Laurence. 1969. *The Peter principle.* New York: William Morrow & Company Inc.

RStudio, P. B.C. 2021. RStudio | Open source & professional software for data science teams. https://www.rstudio.com/. Accessed 31 December 2021.

Saltan, Andrey, and Kari Smolander. 2021. Bridging the state-of-the-art and the state-of-the-practice of SaaS pricing: A multivocal literature review. *Information and Software Technology* 133:106510. doi: 10.1016/j.infsof.2021.106510.

Singh, Simran. 2021. Evaluation and Effectiveness of VR Soft Skills training - YesVr. https://yesvr.com.au/evaluation-and-effectiveness-of-vr-soft-skills-training/. Accessed 31 December 2021.

Smidt, Andy, Susan Balandin, Jeff Sigafoos, and Vicki A. Reed. 2009. The Kirkpatrick model: A useful tool for evaluating training outcomes. *Journal of intellectual & developmental disability* 34 (3): 266–274. doi: 10.1080/13668250903093125.

Srimannarayana, M. 2011. Measuring Training & Development. *Indian Journal of Industrial Relations* 47 (1): 117–125.

Tambe, Prasanna, Peter Cappelli, and Valery Yakubovich. 2019. Artificial Intelligence in Human Resources Management: Challenges and a Path Forward. *California Management Review* 61 (4): 15–42. doi: 10.1177/0008125619867910.

Topno, Harshit. 2012. Evaluation of Training and Development: An Analysis of Various Models. *IOSR Journal of Business and Management* (Volume 5, Issue 2): 16–22.

Tyrväinen, Pasi, and Joona Selin. 2011. How to Sell SaaS: A Model for Main Factors of Marketing and Selling Software-as-a-Service. In *Software Business*, ed. Björn Regnell, Inge van de Weerd and Olga de Troyer, 2–16. Berlin, Heidelberg: Springer Berlin Heidelberg.

Winterton, Jonathan. 2007. Training, Development, and Competence. In *The Oxford handbook of human resource management*, ed. Peter F. Boxall, 324–343. Oxford: Oxford Univ. Press.

Appendix

1. Appendix: Dataset Structure

ID	Place	location	date	status	job title	summary	positives	negatives	advice to mgmt
2	Google	Mountain View, CA	Jun 21, 2013	Former Employee	Program Manager	Moving at the speed of light, burn out is inevitable	1) Food, food, food. 15+ cafes on main campus (MTV) alone...	1) Work/life balance. What balance? All those perks and ben...	1) Don't dismiss emotional intelligence and adaptive leaders...
7822	Amazon	Seattle, WA	Jan 10, 2016	Current Employee	Anonymous Employee	You Get What You Put In	Really smart people, a lot of opportunity for growth, always ...	You have to be self motivated. NO ONE will hold your hand ...	More on-boarding training before new employees are thro...
7823	Amazon	Seattle, WA	Feb 20, 2016	Current Employee	Senior Engineering Manager	Exciting Work, Abusive Culture	Jeff Bezos and his ""S-Team"" are brilliant and continue to m...	The management process is abusive, and I'm currently a ma...	Don't pretend that the recent NY Times article was all about...
7824	Amazon	Seattle, WA	Dec 17, 2013	Current Employee	Software Development Manager	Can be amazing for some people, horrible for others	Amazon is doing lot's of cool stuff...but lots of boring stuff t...	- You're responsible for your own career progression and fin...	Stack ranking is a horrible practice since it's rife with favoriti...
3	Google	New York, NY	May 10, 2014	Current Employee	Software Engineer III	Great balance between big-company security and fun, fast-...	^ If you're a software engineer, you're among the kings of th...	* It *is* becoming larger, and with it comes growing pains: b...	Keep the focus on the user. Everything else will follow.
36651	Apple		Aug 28, 2014	Current Employee	Anonymous Employee	Challenging, Rewarding, but ZERO work/life balance. Most s...	We work with geniuses - in every department, We create inn...	ZERO ZERO ZERO work/life balance. Execs have been saying...	
7820	Amazon	Phoenix, AZ	None	Current Employee	Software Development Manager	An Amazing Place to Work	I've been at Amazon for a month now, and I've seen none o...	No cons, so far - seriously. Like I said, I'm sure Amazon has s...	
4	Google	Mountain View, CA	Feb 8, 2015	Current Employee	Anonymous Employee	The best place I've worked and also the most demanding.	You can't find a more well-regarded company that actually ...	I live in SF so the commute can take between 1.5 hours to 1....	Keep on NOT micromanaging - that is a huge benefit to Go...
10669	Amazon	Seattle, WA	Sep 19, 2014	Current Employee	Software Development Engineer	A huge diverse high tech company with all sorts of stuff	Disclaimer: My opinions reflect that of an SDE in Amazon. S...	Beware of bad managers and horrible team mates. They are ...	The thing about thinking long-term is getting more and mo...
34453	Facebook	Seattle, WA	Mar 17, 2014	Former Employee	Software Development Engineer	Open, fast, no bs	It might be easy to roll your eyes when people from Facebo...	FB expects a lot out of engineers, and you can't slack off. Of...	You need to focus on how you are going to maintain the exi...
36653	Apple	Lakewood, CO	May 13, 2015	Current Employee	Apple At Home Advisor	At-Home-Advisor	The position is at home. The company is AMAZING. There a...	The schedule changes every 90 days and you have to bid fo...	The management consists of a team manager and their area...
7825	Amazon	Seattle, WA	Mar 23, 2017	Former Employee	Anonymous Employee	We are now in a world where we are condescended to by o...	This company gets A list performance from C list employees...	Maybe because the company recruits C listers who have nei...	Bezos you bought the Washington Post and hired Jay Carne...
34252	Facebook	Menlo Park, CA	Feb 16, 2016	Current Employee	Site Selection Program Manager	Pleasantly Surprised	I'm a 55 year old working in a company where the average a...	Like any tech company, the work is big and complicated so ...	Keep doing what you're doing and fight hard to not be com...
36784	Apple	Cupertino, CA	Jan 22, 2016	Current Employee	Software Engineer IV	Changing the world (in a small way)	Working at Apple means that the things you work on get int...	It's a lot of work, teams are usually strapped for resources a...	Keep fighting for ""what's right"". Renewable energy, civil lib...
34251	Facebook	Menlo Park, CA	Feb 16, 2017	Current Employee	Anonymous Employee	Fast paced company with high expectations, but incredibly f...	- Incredible benefits - Excellent compensation that rewards ...	- If you don't learn to make the work life balance work for y...	Keep doing what you're doing, keep an eye on employee b...
7826	Amazon	Carlisle, PA	May 15, 2017	Former Employee	Tier I Warehouse Associate	Warehouse associate, full time for over two years	Great starting pay and the ability to get raises very quickly. ...	After 3 years of working with the company you ""cap out"" ...	
36652	Apple	Tempe, AZ	Mar 10, 2017	Current Employee	Specialist	A Company as Meticulous as Their Products!	Competitive Pay, Great Benefits, Amazing People, Great Wor...	None! I had one of the best times ever at this company. Ho...	You guys are awesome. Keep up the good work!
7827	Amazon	Seattle, WA	Mar 29, 2017	Current Employee	Finance Manager	Great place to learn, churn n burn culture in finance	- super smart people, the best of the best from schools - if y...	- frugality is taken to the extreme, only 2 weeks vacation, pa...	The culture and reputation of amazon will never change unl...
33394	Amazon	Bengaluru (India)	May 3, 2013	Current Employee	Senior Engineer	Things to Keep in Mind before joining Amazon	so called brand - nothing else	# 1 -> Risky for outside hires You see Amazon recruiting all ...	Be honest and ethical
6432	Google	Bengaluru (India)	Aug 4, 2014	Current Employee	Software Engineer	Great place for software engineers	Amazing work culture, cutting edge work, flexibility and ind...	Your growth in the company directly depends on the efforts...	
17141	Amazon		Apr 6, 2015	Current Employee	Anonymous Employee	Everyone is very nice. Amazon Web Service Team is best out...	vibrant, fast paced culture - smart, fun, aggressive colleague...	Worse still is the politics. When you hire a bunch of smart, a...	
34759	Facebook	Menlo Park, CA	May 1, 2015	Current Employee	Software Engineer	Landslide win over Google for career growth	I just left Google and joined Facebook, and felt so much hap...	1. I don't quite like the office decoration style. A little bit str...	
41614	Apple	Stamford, CT	Sep 10, 2014	Former Employee	Family Room Specialist	Company genuinely cares about you!	- Great benefits - great work environment - great salary (es...	- Too much ""drinking the kool aid"". WAY too much. I hope...	My feedback section was long. I realize, but it's because I ge...
22620	Amazon		Aug 19, 2014	Current Employee	Area Manager	Area Manager - think long and hard before you accept.	monetary compensation (base salary, stock options, quarterl...	Where to begin... Everything you'll read in the previous revie...	No need to give advice. Amazon knows how they treat Area...
40453	Apple		May 21, 2015	Current Employee	Applecare At Home Advisor	AppleCare Advisor (AHA)	Excellent work environment as you get to work from the co...	Your work schedule, though flexible, is set for anywhere fro...	
36001	Netflix	Los Gatos, CA	Jul 8, 2016	Current Employee	Senior Software Engineer	The best job I've had, and at times, the worst job I've had	Netflix has some great pros. You'll be working with mostly e...	The high salary leads some people to ramp up their lifestyle...	More communication with your teams is absolutely essentia...
26881	Amazon	Hyderabad (India)	Jun 8, 2017	Former Employee	Other	Amazing Amazon	I had an amazing time working with Amazon. Many learning...	Salary. The Only reason why I am not trying to join Amazon ...	Please improve the salary structure

Figure 15: Glimpse into Glassdoor Dataset

2. Appendix: Interview Script

Introduction:

Hi, thank you for taking your time. I'm here to speak with you about your current learning and development solution for my master thesis research. So, without further due, let's get started:

1. What type of training and development solution are you currently using? Follow up: Do you have a centralized tool, or can everyone use Coursera /other?) And: How does it work / what is the key functionality?
2. Where do you see the most significant room for improvement of the current solution? Follow up – what is the best aspect of the tool?
3. On a scale of 0 to 10, how likely are you to recommend your current solution to a friend or colleague?
4. Are you evaluating your current L&D efforts? If yes, could you indicate in what time intervals you do so?
5. What approach are you using for your evaluation?
6. What conclusions can you draw from your evaluation, and do you take action based on the statistics you receive?

7. Do you connect learning and development initiatives with your key strategic goals?
8. Where do you see the most prominent space for improvement in terms of learning and development in general?
9. Do you think there are any significant skill gaps in your organization right now? Follow up if yes: Please specify where you see the most significant gaps, or can you imagine skill gaps you do not know of?
10. On a scale of 0 to 10, how likely are you to switch to a learning and development solution that creates an individualized skill path for each employee?

3. Appendix Wordcloud

Figure 16: Wordcloud Summary Comments

4. Sentiment

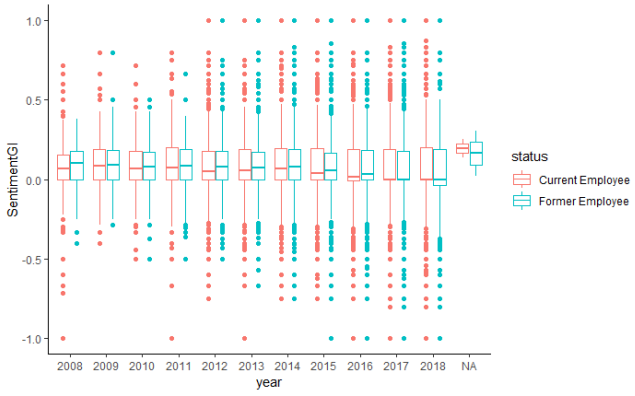


Figure 17: Current vs. Former Employee Sentiment

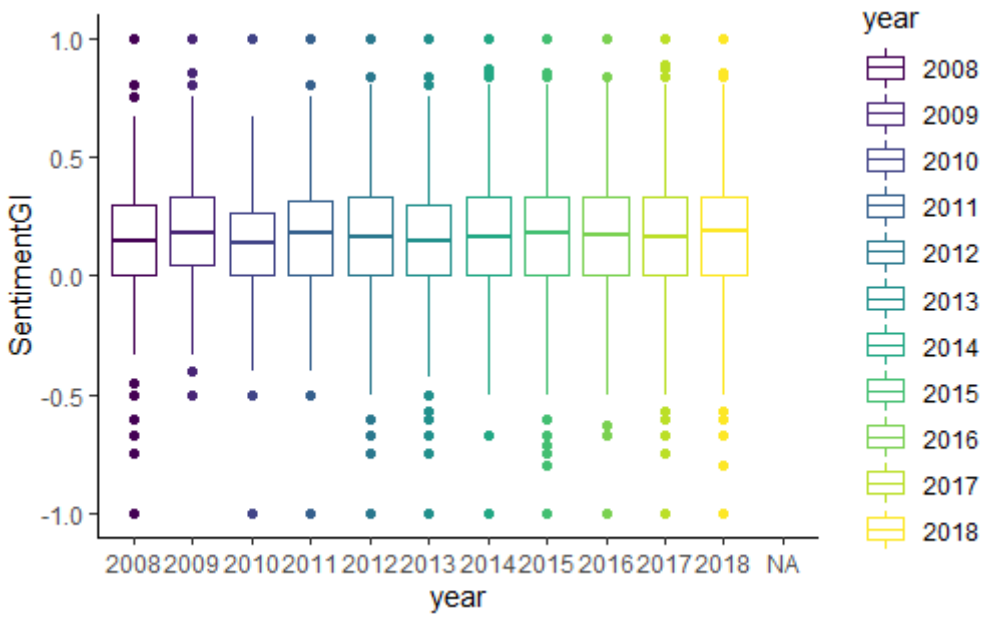


Figure 18: Sentiment Summary Comments

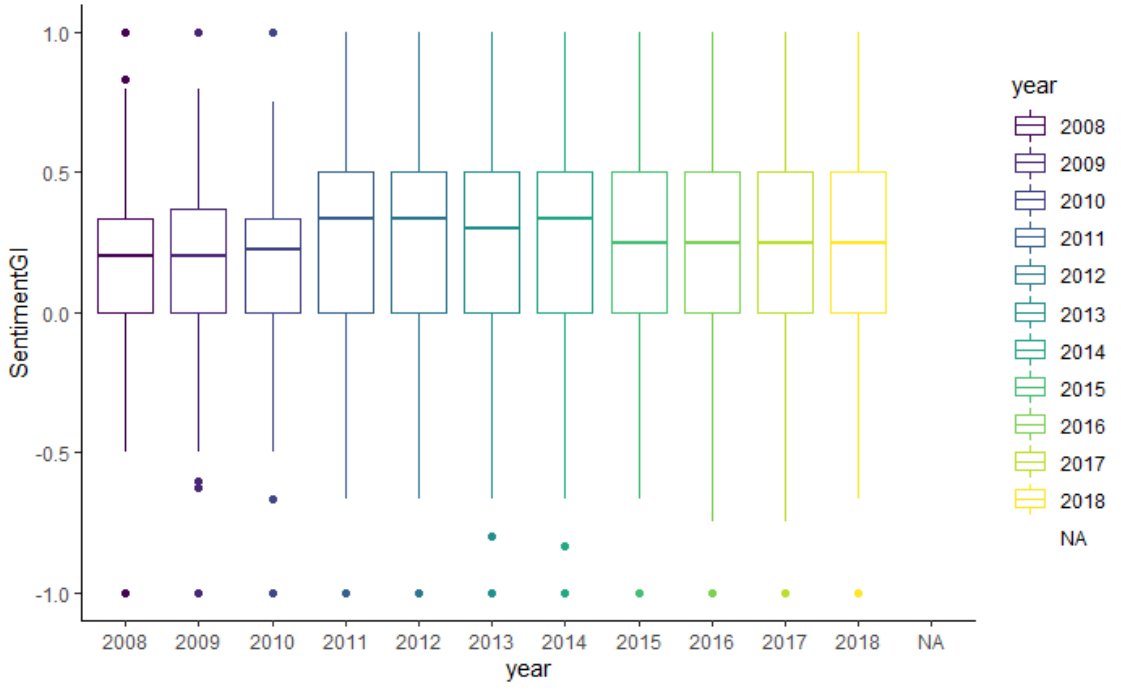
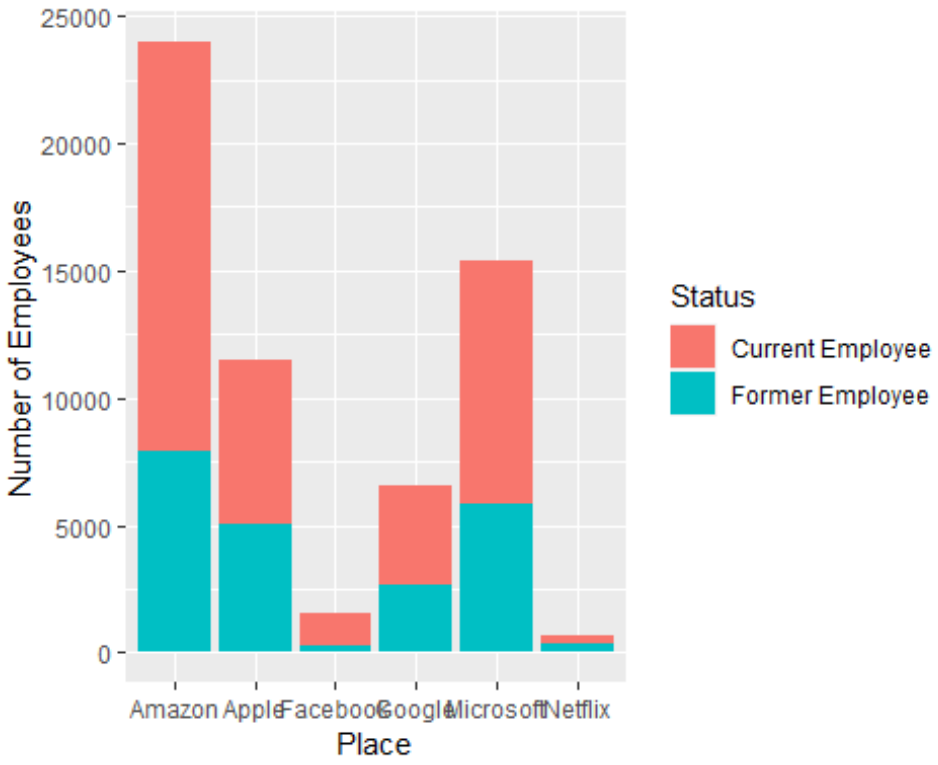


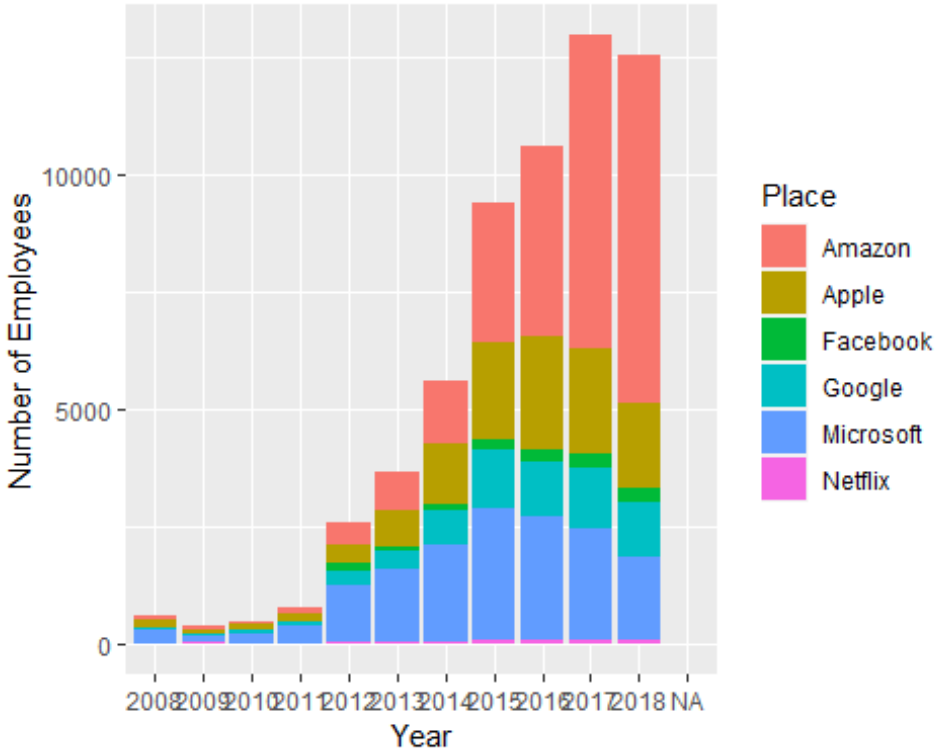
Figure 19: Sentiment Advice to management

5. Appendix: R Script Code and Output

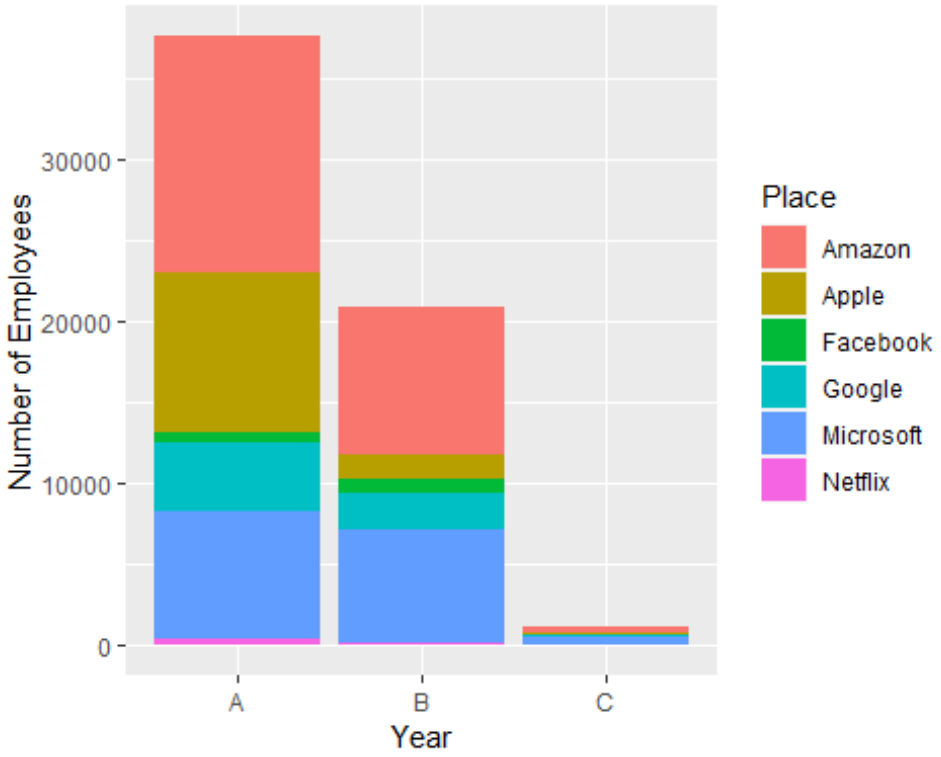
```
#explore data
skim(total)

#plot observations per employer(p) and year(p1)
p <- ggplot(total, aes(factor(Place)))
p1 <- ggplot(total, aes(factor(year)))
p2 <- ggplot(depr_df, aes(factor(combined)))

p + geom_bar(aes(fill = factor(status))) +
  labs(y ="Number of Employees", fill="Status") +
  xlab("Place")
```




```
p1 + geom_bar(aes(x= factor(year), fill=Place)) +
  labs(y ="Number of Employees", fill="Place") +
  xlab("Year")
```

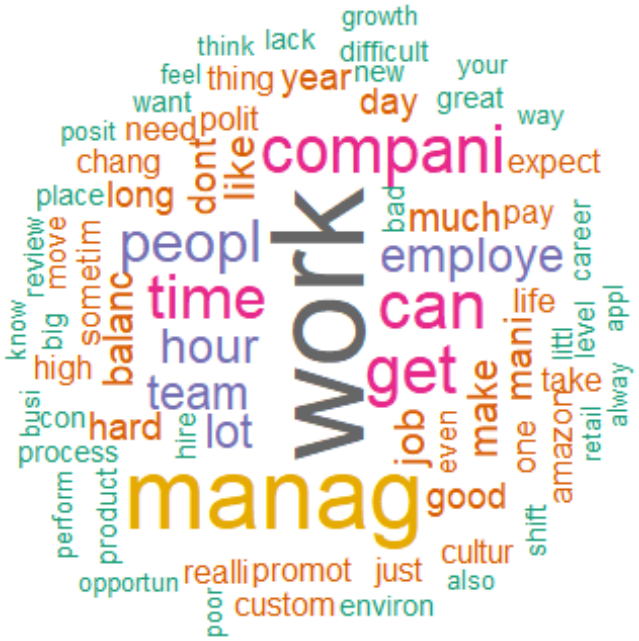



```
p2 + geom_bar(aes(x= factor(combined), fill=Place)) +
  labs(y ="Number of Employees", fill="Place") +
  xlab("Year")
```




```
#increase limit of computational power
gc()

##            used  (Mb) gc trigger  (Mb) max used  (Mb)
## Ncells  5377075 287.2    7811648 417.2  7811648 417.2
## Vcells 24004958 183.2   39647015 302.5 39647010 302.5
```

```
memory.limit()

## [1] 15789

memory.limit(size=50000)

## [1] 50000

#use sum function
sums <- as.data.frame(colSums(as.matrix(DTMneg)))
sums1 <- as.data.frame(colSums(as.matrix(DTMpos)))
sums2 <- as.data.frame(colSums(as.matrix(DTMadv)))
sums3 <- as.data.frame(colSums(as.matrix(DTMsum)))
#sums4 <- as.data.frame(colSums(as.matrix(dtm_1)))

#restructure data
sums <- rownames_to_column(sums)
sums1 <- rownames_to_column(sums1)
sums2 <- rownames_to_column(sums2)
sums3 <- rownames_to_column(sums3)
#sums4 <- rownames_to_column(sums4)

#limit to term and count
colnames(sums) <- c("term", "count")
colnames(sums1) <- c("term", "count")
colnames(sums2) <- c("term", "count")
colnames(sums3) <- c("term", "count")
#colnames(sums4) <- c("term", "count")

#rearange order according to count
sums <- arrange(sums, desc(count))
sums1 <- arrange(sums1, desc(count))
sums2 <- arrange(sums2, desc(count))
sums3 <- arrange(sums3, desc(count))
#sums4 <- arrange(sums4, desc(count))

#show first 75 rows only
head <- sums[1:75,]
head1 <- sums1[1:75,]
head2 <- sums2[1:75,]
head3 <- sums3[1:75,]
#head4 <- sums4[1:75,]

#write.csv(head3, "Summ_Topics.csv") --> for further xsv. analysis

#create wordclouds
wordcloud(words = head$term, freq = head$count, min.freq = 1000,
  max.words=100, random.order=FALSE, rot.per=0.35,
  colors=brewer.pal(8, "Dark2"))
```




```
wordcloud(words = head1$term, freq = head1$count, min.freq = 1000,
  max.words=100, random.order=FALSE, rot.per=0.35,
  colors=brewer.pal(8, "Dark2"))
```


```
wordcloud(words = head2$term, freq = head2$count, min.freq = 1000,
  max.words=100, random.order=FALSE, rot.per=0.35,
  colors=brewer.pal(8, "Dark2"))
```


```
wordcloud(words = head3$term, freq = head3$count, min.freq = 1000,
  max.words=100, random.order=FALSE, rot.per=0.35,
  colors=brewer.pal(8, "Dark2"))
```


```
#wordcloud(words = head4$term, freq = head3$count, min.freq = #1000,
#  max.words=100, random.order=FALSE, rot.per=0.35,
#  colors=brewer.pal(8, "Dark2"))## negative wordcloud / #different cleaning

summary(sent$SentimentGI)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
## -1.0000  0.0000  0.0354  0.0632  0.1875  1.0000      28

summary(sent1$SentimentGI)

##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
## -1.0000  0.2000  0.3333  0.3398  0.5000  1.0000       4

summary(sent2$SentimentGI)

##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##  -1.000   0.000   0.167   0.188   0.333   1.000   26056

summary(sent3$SentimentGI)

##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
## -1.0000  0.0000  0.2500  0.2846  0.5000  1.0000     737

# Start by attaching to other data which has the company names
final <- bind_cols(depr_df, sent)   #negative
final1 <- bind_cols(depr_df, sent1) #positive
final2 <- bind_cols(depr_df, sent2) #advice
final3 <- bind_cols(depr_df, sent3) #sum



# Extract matching rows with %like%
dednegFinal <- final[final$negatives %like% "growth"|final$negatives %like% "move"|fi
nal$negatives %like% "level", ]
# Extract matching rows with %like% : growth; move; way; level
head(dednegFinal)

##    ID  Place          location          date           status
## 1:  3 Google      New York, NY  May 10, 2014 Current Employee
## 2:  5 Google   Los Angeles, CA  Jul 19, 2018  Former Employee
## 3:  9 Google      New York, NY  Dec 10, 2018 Current Employee
## 4: 32 Google Mountain View, CA   Dec 9, 2018  Former Employee
## 5: 57 Google                    Nov 20, 2018 Current Employee
## 6: 66 Google Mountain View, CA  Nov 19, 2018  Former Employee
##                job_title
## 1: Software Engineer III
## 2:     Software Engineer
## 3:    Anonymous Employee
## 4:       Senior Director
## 5:    Anonymous Employee
## 6:      Legal Specialist
##                                                                      summary
## 1: Great balance between big-company security and fun, fast-moving projects
## 2:                                              Unique, one of a kind dream job
## 3:                                   Google Surpasses Realistic Expectations
## 4:                                                             Senior Director
## 5:                                                  Senior Software Engineer
## 6:                          Great benefits, but large enough to get lost in.
##
positives
## 1:
* If you're a software engineer, you're among the kings of the hill at Google. It's a
n engineer-driven company without a doubt (that *is* changing, but it's still very en
gineer-focused). * The perks are amazing. Yes, free breakfast, lunch, an dinner every
weekday. Aaaaaamazing holiday parties (at Waldorf Astoria, NY Public Library, MoMA, e
tc.), overnight ski trips to Vermont, overnight nature trips to the Poconos in the su
mmer, summer picnics at Chelsea piers, and on and on and on. I don't see this going a
way unless the company starts hurting financially. * Speaking of which, the company i
s doing quite well, which reflects in bonuses and equity grants. * There a huge diver
sity of work ranging from defending independent journalism worldwide (Google Project
Shield) to crisis response during disasters (see Maps during Hurricane Sandy or Tsuna
mis), to the best machine learning experts and projects in the world, to more mundane
revenue-driving projects in advertising, there's really something for everybody. * It
```

's easy to move around within the company as long as you're in good standing (the vas
t majority of engineers are). * The company is amazingly open: every week Larry Page
and Sergey Brin host what's called TGIF where food, beer, wine, etc. is served, a new
project is presented, and afterward there's an open forum to ask the executives anyth
ing you want. It's truly fair game to ask anything, no matter how controversial, and
frequently the executives will be responsive. * No, nobody cares if you use an iPhone
, Facebook, shop with Amazon, stream using Spotify, or refuse to use Google+. The com
pany is amazingly open and flexible. Neither pro nor con, but general information on
work-life balance, promotions, and advancement. * Work life balance can be what you w
ant it to be on most teams. (Some teams are in more competitive sectors and require m
ore crazy hours all the time - but very few of them). If you do what's expected, you'
ll be fine at least for a handful of years. Working a roughly 40 hour work week is po
ssible, and many people do it. There are also people who are hyper-motived and work l
ike crazy just because they love it, or because they're competitive, or they want to
get a promotion. If you work 40 hour weeks without putting in anything extra, you'll
fall behind them as they advance and you stand still - and maybe that doesn't matter,
so it works out for everybody. But at least know where you would realistically stand.
* If you excel and work your butt off, you'll be compensated and promoted. If you let
yourself be a code monkey, and just sit coding with your head down all day, you'll be
fine but won't advance. A big complaint from some Googlers is about not being able to
advance ""even at Google"" with pure coding. Sure, if you're the uber genius who crea
ted MapReduce and Bigtable, you're going to advance like a rocket without having to d
o anything but coding, but if you're like most engineers at Google -- smarter than av
erage, but just average compared to other Googlers -- you're just a good coder and no
t revolutionary. Code monkeys are important to actually get stuff done, and to be sur
e you absolutely need to be a good coder as a software engineer (it's the minimum req
uirement), but code monkeys won't advance because they're not leaders and they're eas
y to replace. To get promoted you need to lead and do more than just code. There are
plenty of ways to lead other than being an official tech lead, so this isn't actually
that hard, so the real point is just that you can't just sit there coding what othe
r people tell you to code all day and expect to advance.
2: Google is a world of its own. At every other company, there were lots of people
who had serious gaps in their skills. At Google, I could have a serious work conversa
tion about technology with everyone and could trust that they have solid expertise. I
n that way, Google is a sheltered garden from the rest of the world. There is a gene
ral sense of trust in the company. You can leave your valuables and laptops lying aro
und, and they are safe. People joke that it's the only place where you use an expansi
ve laptop to reserve a seat at the cafeteria, while walking away. At other companies
, teams are very protective of their own code. Trying to execute another team's code
requires following a 50 step installation process that's out of date and was never co
mplete to begin with. Google has almost all the code in the same source repository. A
n engineer can look at the code, easily execute the code because it comes with intell
igent defaults and standard build process, and contribute enhancements/bug fixes. The
other teams are generally grateful for getting improvements. They understand that it'
s better for the company if the bug is fixed rather than holding onto territory or in
sisting on their own strange ways. Google takes care of you all around. From food, h
ealth care, generous vacation, onsite gym, and so on, you are well taken care off and
can focus on work rather than dealing with life's hassles. There are cases where Goog
le goes above and beyond tremendously. Here is an example that floats around internal
ly. A Googler had worked at Amazon before. Amazon relocated him. Because of the reloc
ation, he had to change his partner's health insurance for some critical and expensiv
e life changing medication. Due to same sex partner and relocation, the health insura
nce company refused. Amazon was so unhelpful that the HR representative who was force
d to deliver the news broke down crying and then quit over it. He switched to Google.
The Google HR department negotiated an exception for him with the health insurance an
d included the necessary change for the following policy year for all employees. A l
ot of Google products have a huge impact with over a billion users. Working there, yo
u can feel that you change the world. I was very happy with the compensation. There
are also a lot of opportunities in the company to follow your interest. Pretty much a
nyone can get an intern, participate in setting coding standards (obviously you have
to argue the case for your proposals), interviewing, supporting local schools with te
ch expertise. Google opened up a lot of opportunities in the community or in general
in tech to volunteer in. Google is considered the largest functioning anarchy. That
has its good sides, like the glee of joy for operating without strict oversight. It a
lso has its dark side, like a hands-off management tends to encourage politics. Anot
her beauty for engineers are internal tools. Your development environment is in the c
loud. You can sit down at a loaner computer and be productive within seconds. There i

s a massive cloud compiling system that shards your compiles across many computers in the cloud. The search function across the codebase is powerful. You'll feel that down loading and compiling code on your own computer in your IDE is something of another e poch, like something from before the industrial revolution. The Google badge is a wo nderful thing to carry. It opens doors to a different world. The office spaces are be autiful with work, rest, and play areas. The MTV location is like a utopian city on i ts own. Everything in it, food, drinks, work spaces, swimming pools, gym, bowling all eys, showers, and so on are free (for employees). It is a whole world of its own. Mo st companies have a one-over-one promotion model. Your boss has to decide to promote you. Your bosses boss has to sign off on it. At Google, the promotion is decided by a relatively impartial committee that due to promoting lots of people has experience in it. You can even get promoted in rare cases against the will of your manager. Rumor h as it that managers won't hold a grudge if that happens but support it. The hiring co mmittee looks at a promotion packet that includes reviews from peers. There can even be unrequested peer reviews. In general, it creates an environment that discourages b icycling - bowing to the higher ups and kicking the lower downs hard. However some pe ople have realized that they can hurt colleagues with bad reviews and impunity. It's rare, but colleagues careers took a dive due to someone holding a grudge or simply wr iting a thoughtless review. (There is some concern about stack ranking, but I don't u nderstand enough of the background to comment on it. There are plenty of discussions with insight elsewhere.) To underscore how Google is one of a kind, there is an inte rnal database with legendary things that happened at Google. Someone parked his car f or many years on the employee parking lot. When after years, he went looking for his car, it was gone. He went to security. He found out that it was simply moved because the parking lot had been repaved. Another Googler lived in the office fulltime to sav e money on rent. He wrote a guide on how to do that. As there are showers and other f acilities, it is possible to do so. And Google let it happen. After a while of saving rent payment, he could afford the down payment on buying his own place. All these sto ries make Google a wonderful place to work at. An important topic to bring up is wor k/life balance. Work/life balance is an amorphous topic that means a lot of different things to different people. Getting up to speed at Google is consuming. Depending on your work, it could take a year to become productive. Many colleagues reported no lon ger having a personal life after starting at Google. Some colleagues simply love tech nology and can't think of anything better than working until the AM hours on some tec h that gets them excited. You can tell these people by physically looking at them. Fo r them, it is a heaven. If you are a balanced person with personal interests and rela tionships, you are likely going to be challenged. If you signed up for one of the big five tech companies, you wanted challenge, right. If I would do something differently , it is to take advantage of all time saving things. Pay for a laundry service. Pay f or a cleaning service. I've had a moral hangup about doing that because on a moral le vel, my time shouldn't be more worthy than that of another human being. If I could do it all over again, I'd pay for every possible service to save time. In the grander sc heme of things, if you work at Google, your skill is so valuable to humanity that you should make use of it instead of standing in line at the grocery store. I don't mean that in an arrogant way. If you work on a service with a billion users, your ability to make life better for them with another hour of work is worth more than folding lau ndry. You've paid the price in education, training, and effort to be able to do that. Make use of your power for the great code. (The view that all those perks are only th ere to keep your nose closer to the grindstone is the wrong way of looking at it from a philosophical point, in my humble opinion.) For full disclosure, there are some pe ople who coast at Google. They probably don't have any complains about work/life bala nce or perhaps the worst complaints because they are all about coasting. Many compan y mishandle projects. When the next time comes around, they mishandle it in the same way because the people responsible aren't the ones working late nights and weekends. Google does two things to get better: (1) There are honest and public postmortems. Th ey are the pride of a lot of true engineers. (2) Zeitgeist is an annual survey about the work place and the company. The survey is quite exhaustive. Every manager from th e CEO to the front-line manager reports on the result of his/her area. Then they take actions to attempt to improve areas that got low scores. Having worked at companies w here now improvement effort is done, this annual and systematic process is very refre shing.

3:

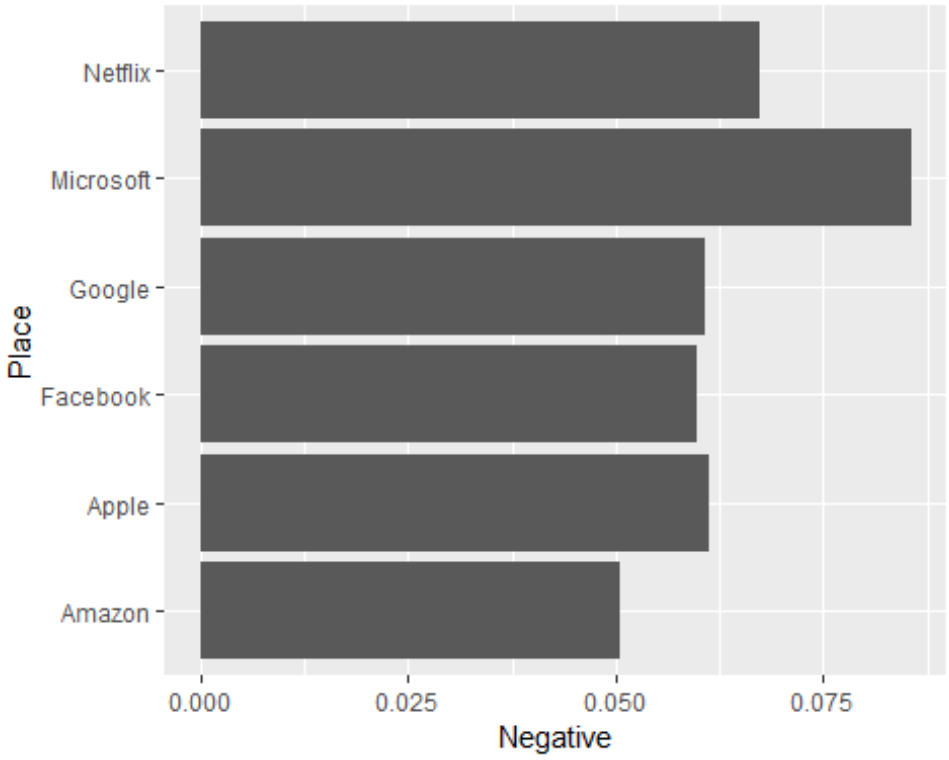
Great products. Vision you can feel good about. Fair compensation. Automonomy in your role. Wide array of industries / roles employees are able to explore. Feedback loops give employees that ability to provide feedback to management regularly on their perf ormance. Expectation that you will go above and beyond the minimum scope of your role - those that do, are typically rewarded. What more do you want from an employer.

```
## 4:
So many brilliant people Tons of resources Working on amazingly cool technologies Gre
at culture - they really care about employees, actively ask for feedback, and act on
it (e.g. Set corporate OKR's to improve on problem issues)
## 5:
Brilliant people, tons of awesome technical infrastructure, focus on technical excell
ence, great ability to move between projects and become well-rounded.
## 6:
Great benefits, work life balance, and pay for the position.
##
negatives
## 1:
* It *is* becoming larger, and with it comes growing pains: bureaucracy, slow to resp
ond to market threats, bloated teams, cross-divisional tension (though nothing remote
ly approaching that of Microsoft's internal tension). * The quality of the engineers
is possibly dropping, but possibly not. It's hard to get real metrics, because as the
absolute number of people grows, naturally the number of bad apples grows, as a perce
ntage it's supposedly the same as it ever was, but with larger numbers of poorer qual
ity engineers it just _feels_ like things might be changing for the worse. * Also wit
h growth means more internal-confidential data leaks (again, because of the raw numbe
rs of people) -- product announcements being ruined, etc. That means the company has
to be tighter-lipped internally to avoid leaks, which makes things less open. It's st
ill an amazingly open place, but less so than it was even a couple years ago. The goo
d thing is they recognize it and actively look to improve things because they know ho
w important it is to keep the good culture.
## 2: If you don't work in MTV (HQ), you will be given work. However if you are passi
onate and want to advance your career, you should relocated to MTV. Any project that
started doing well and getting important seemed to get transferred there. Promotion o
pportunities are better there. It seemed that everyone who relocated from another loc
ation to MTV, was a lot happier.  Officially, the company focuses on impact. In pract
ice, it seems to focus on being highly productive in producing code, but not necessar
ily in actually succeeding. In theory, if you have a simple idea that doubles the rev
enue/customer satisfaction, it should be more appreciated than an idea that took a lo
t of effort/difficulty and had less improvement. But it tends to be the other way.  P
romotions tend to be tied to launching a project that makes peers at a higher level h
appy. That's often easier with an API that happens to be really useful for peers than
launches that benefit users. Landing the right kind of project to work on is a big fa
ctor of getting a promotion, which is easier in MTV and also encourages politics. A c
olleague was told directly from his boss that he has to get better at ""turf war.""
A general rule of thumb is that everyone ends up in ads. Non-ads projects tend to be
more volatile and have a tendency to end with people ending up on ads projects. This
is not necessarily a con. One should simply prepare for it.  There seems to be a gene
ral trend as Google gets larger (60K+ employees) and the founders are withdrawing the
ir impact on the company that Google's specialty is fading a bit. Microkitchens stock
less eye popping snacks and drinks. The Christmas gift went from a nice bundle of cas
h to a coveted phone to a cheap phone to simply a donation to a charity of your choic
e. The hiring bar seems to get lowered to satisfy the need to hire more people.  Mana
gers tend to become managers for their tech skills and not management skills. It defi
nitely shows in the quality of management. Very smart people, very technically capabl
e, not so business and people savvy. This is not necessarily a complete con because a
manager without a clue in tech is definitely a lot worse.  There are some stars that
people belief that Google still has but doesn't. The myth of 20% time is alive outsid
e of Google. It's discouraged inside of Google. The only person whom I knew to partic
ipate in 20% time did so by working on another team, which he wanted to test out befo
re transferring. Outside people belief that 1 day a week a Google can work on anythin
g he/she deems interesting. Management doesn't outright deny it, but it's formulated
as: If you work 20% time on something else, it has to have company impact worth 20%.
This is not necessarily a con. It's more like a missing pro.  Another shining star th
at's gone is the ""don't be evil"" motto. It was silently dropped and replaced with "
"do the right thing."" Google didn't turn overnight evil. There is some philosophical
case to be made why the new motto is better. However it seems with the founders drawi
ng back from company involvement that the dramatic standing up for users of the old t
imes is also fading. Google is still a far cry from Monsanto.  If you work there and
want to advance your career, don't volunteer for anything. It is kind of viewed as a
""vacation"" if you volunteer for things. For example at other employers, interviewin
g was viewed as a prestigious activity reserved for the most trusted employees to sha
pe the future. At Google, any hour you spend interviewing means missing an hour to in
```

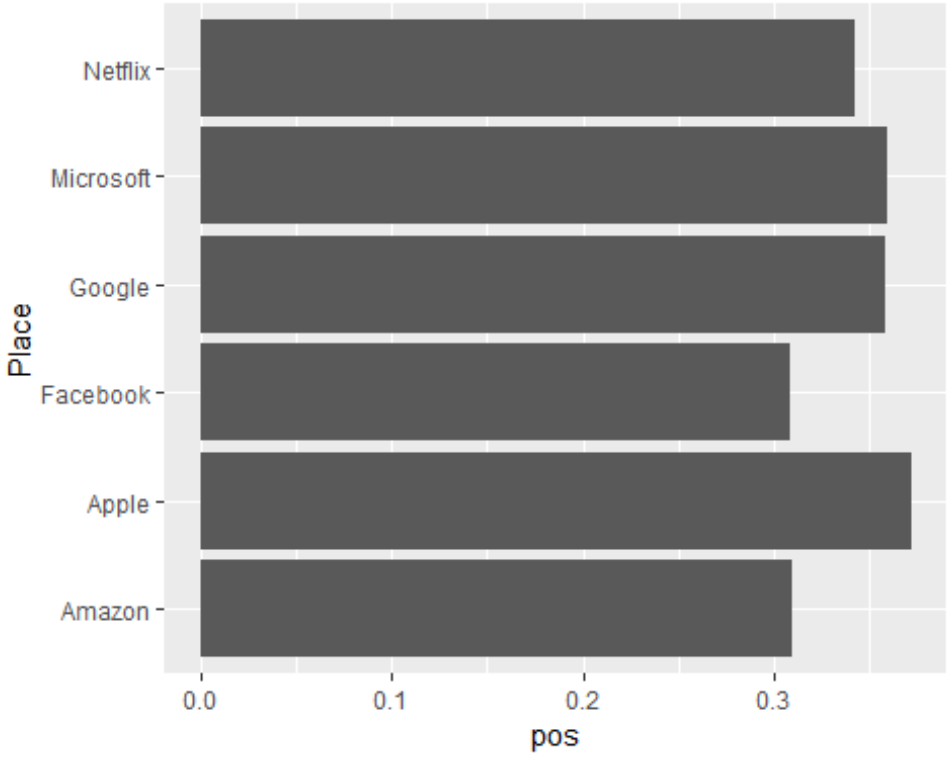
```
crease your performance score. You'll be rewarded for finding ways to dug out of the
interviewing responsibility. Again this is not necessarily a con, simply something to
understand.  You are going to meet some of the brightest and most brilliant people. Y
ou are going to meet people with interesting backgrounds. You are going to have wonde
rfully engaging conversations. But all of that intelligence tends to also have caused
nature to create that intelligence at a trade-off (in some people). Perhaps a lack of
humanity or emotion was the price of it in some people. You are going to have some lu
nch conversations that are going to make you spit your food back out, like a colleagu
e seriously proposing to use nuclear bombs to solve social issues. I sometimes felt t
he need to take a break from the office to be around people who display normal emotio
ns (or any emotion). While the general office culture is very liberal/progressive, th
ere are some pockets of social beliefs that are breathtaking to how little they care
about human life or different lifestyles/opinions out of some law of the strong or ul
tra libertarian reasoning.
## 3:
Younger employees complaining about the company not catering to their individual care
ers aspirations. There is a misconception out there, that if you get into Google you
can move about the company internally super easily. If you're applying to an open rol
e - you're still competing against all external and internal applicants - you're not
guaranteed anything. Typical bureaucratic challenges exist that come with working in
a larger company.
## 4:
Becoming highly bureaucratic Growing political back stabbing, especially at the senio
r management levels
## 5:
- Skills inside Google aren't always easily transferrable to other companies because
there's so much proprietary infra. - People are often way over-qualified for the task
s they're working on. - Everything moves too slowly. There are a million gate-keepers
and approvals to get for any launch, and way too many voices in the room for any deci
sion.
## 6:
Company is so large that it can be hard to make any vertical movement.
##
advice_to_mgmt
## 1:
Keep the focus on the user. Everything else will follow.
## 2: Promote managers into management for their manager skills. Train manager in man
aging skills (both business and people managing skills).  Focus more on the user. It
seems that OKRs are more focused on internal metrics than actually understanding the
user and making them happy.  Roll back the trend towards becoming a regular company.
## 3:
## 4:
## 5:
## 6:
Hire middle managers that care about the psychological safety of your employees.
##    score_1 score_2 score_3 score_4 score_5 score_6 year C B A combined
## 1:       5       4       5       5       4     949 2014   B           B
## 2:       5       5       5       5       5      49 2018   B           B
## 3:       5       5       5       5       5         2018     A         A
## 4:       4       5       5       5       5         2018 C B           B
## 5:       4       4       4       5       3       1 2018     A         A
## 6:       5       5       3       5       4         2018               A
##    WordCount SentimentGI NegativityGI PositivityGI
## 1:        98  0.04081633   0.17346939    0.2142857
## 2:       410  0.13170732   0.09268293    0.2243902
## 3:        38  0.15789474   0.10526316    0.2631579
## 4:        11  0.18181818   0.09090909    0.2727273
## 5:        32  0.09375000   0.03125000    0.1250000
## 6:         7  0.00000000   0.28571429    0.2857143

#benefit; opportunity; learn, career, growth and develop
dedposFinal <- final1[final1$positives %like% "learn"|final1$positives %like% "opport
unity"|final1$positives %like% "career"|final1$positives %like% "growth"|final1$posit
ives %like% "develop", ]

#adv: Promote, train, develop, talent, leadership, opportunity
dedadvFinal <- final2[final2$advice_to_mgmt %like% "Promote"|final2$advice_to_mgmt %l
```

```
ike% "train"|final2$advice_to_mgmt %like% "talent"|final2$advice_to_mgmt %like% "lead
ership"|final2$advice_to_mgmt %like% "develop", ]
#dedadvdtm <- SimpleCorpus(VectorSource(final2$advice_to_mgmt))

#Summ: learn, opportunity, develop and grow
dedsumFinal <- final3[final3$summary %like% "learn"|final3$summary %like% "opportunit
y"|final3$summary %like% "develop"|final3$summary %like% "grow", ]

#write.csv(final1, "final1.csv")

#Mean of SentimentGI is grouped by Place variable.
finaln <-summarise_at(group_by(final,Place),vars(SentimentGI),funs(mean(.,na.rm=TRUE)
))

## Warning: `funs()` was deprecated in dplyr 0.8.0.
## Please use a list of either functions or lambdas:
##
##   # Simple named list:
##   list(mean = mean, median = median)
##
##   # Auto named with `tibble::lst()`:
##   tibble::lst(mean, median)
##
##   # Using lambdas
##   list(~ mean(., trim = .2), ~ median(., na.rm = TRUE))
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_warnings()` to see where this warning was generated.

finaln <- finaln[order(finaln$SentimentGI),]
final1p <-summarise_at(group_by(final1,Place),vars(SentimentGI),funs(mean(.,na.rm=TRU
E)))
final1p <- final1p[order(final1p$SentimentGI),]
final2a <-summarise_at(group_by(final2,Place),vars(SentimentGI),funs(mean(.,na.rm=TRU
E)))
final2a <- final2a[order(final2a$SentimentGI),]
final3s <-summarise_at(group_by(final3,Place),vars(SentimentGI),funs(mean(.,na.rm=TRU
E)))
final3s <- final3s[order(final3s$SentimentGI),]

#rename columns
colnames(finaln)[colnames(finaln) == "SentimentGI"] <- "Negative"
colnames(final1p)[colnames(final1p) == "SentimentGI"] <- "pos"
colnames(final3s)[colnames(final3s) == "SentimentGI"] <- "Summary"
colnames(final2a)[colnames(final2a) == "SentimentGI"] <- "Advice"

#sentiment compared to job level --> unconclusive
sentneg <-summarise_at(group_by(final,combined),vars(SentimentGI),funs(mean(.,na.rm=T
RUE)))
sentpos <-summarise_at(group_by(final1,combined),vars(SentimentGI),funs(mean(.,na.rm=
TRUE)))
sentadv <-summarise_at(group_by(final2,combined),vars(SentimentGI),funs(mean(.,na.rm=
TRUE)))
sentsum <-summarise_at(group_by(final3,combined),vars(SentimentGI),funs(mean(.,na.rm=
TRUE)))

#sentiment compared to status (current or former employee)
statneg <-summarise_at(group_by(final,status),vars(SentimentGI),funs(mean(.,na.rm=TRU
E)))
statpos <-summarise_at(group_by(final1,status),vars(SentimentGI),funs(mean(.,na.rm=TR
UE)))
statadv <-summarise_at(group_by(final2,status),vars(SentimentGI),funs(mean(.,na.rm=TR
UE)))
statsum <-summarise_at(group_by(final3,status),vars(SentimentGI),funs(mean(.,na.rm=TR
UE)))
```

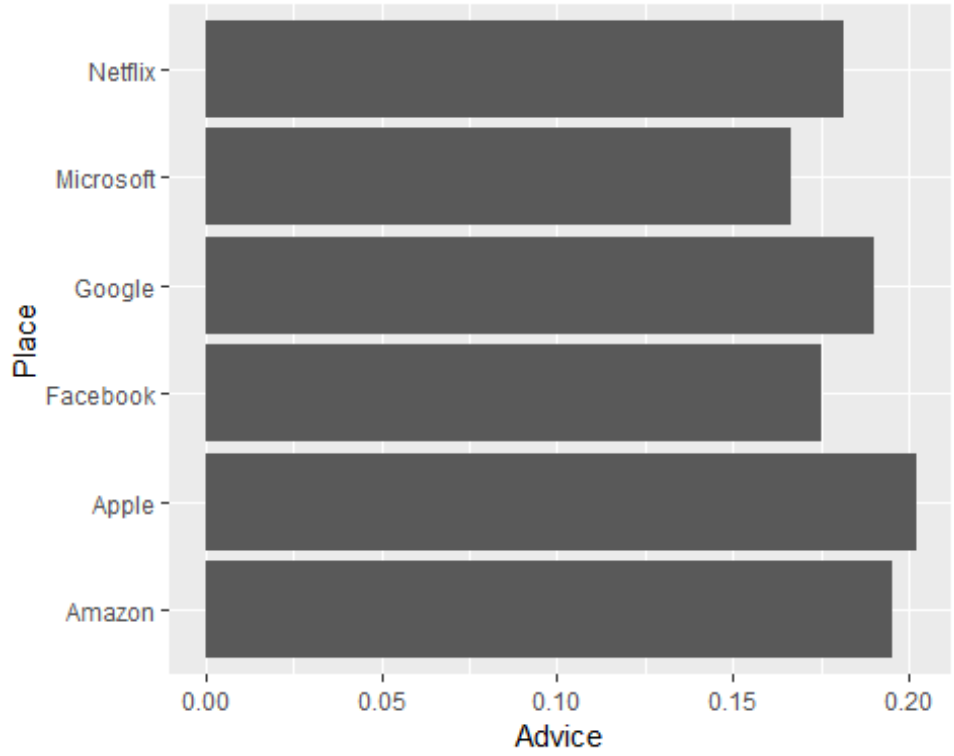
```
#plot relationship of place and sentiment
ggplot(data = finaln, aes(y = Place, x = Negative)) +
  geom_bar(stat = 'identity')
```



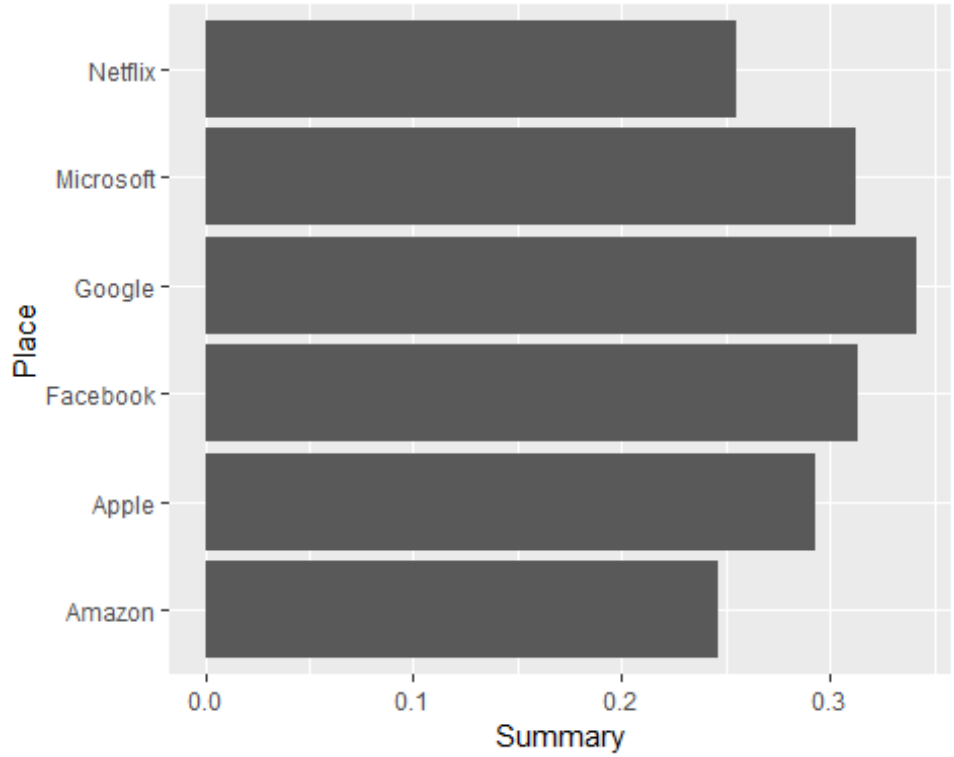

```
ggplot(data = final1p, aes(y = Place, x = pos)) +
  geom_bar(stat = 'identity')
```




```
ggplot(data = final2a, aes(y = Place, x = Advice)) +
  geom_bar(stat = 'identity')
```

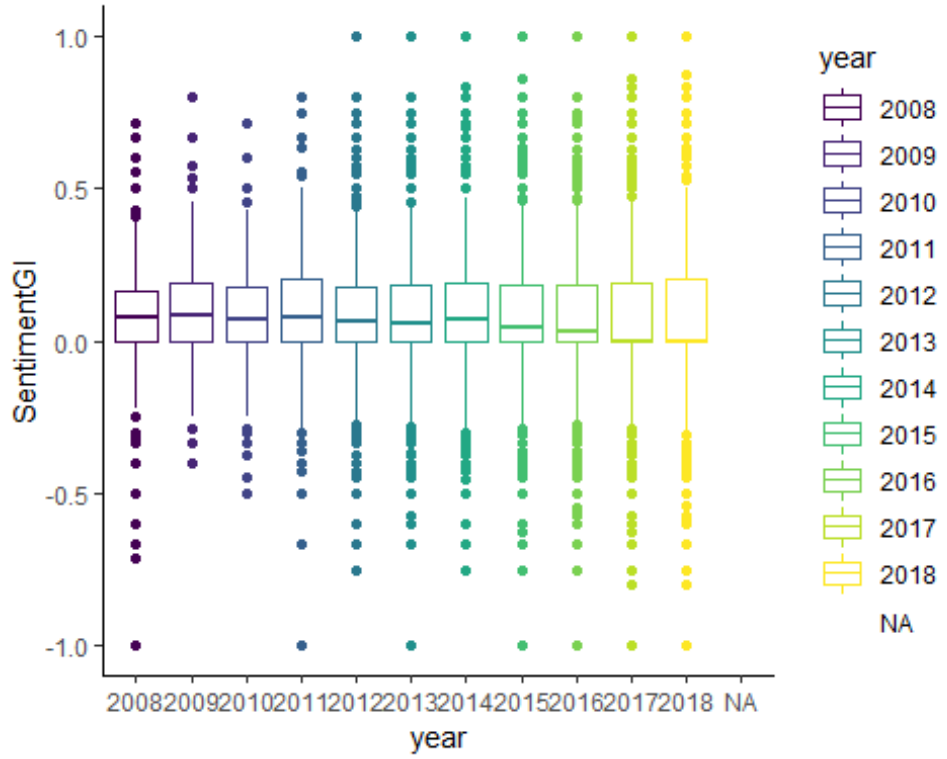



```
ggplot(data = final3s, aes(y = Place, x = Summary)) +
  geom_bar(stat = 'identity')
```

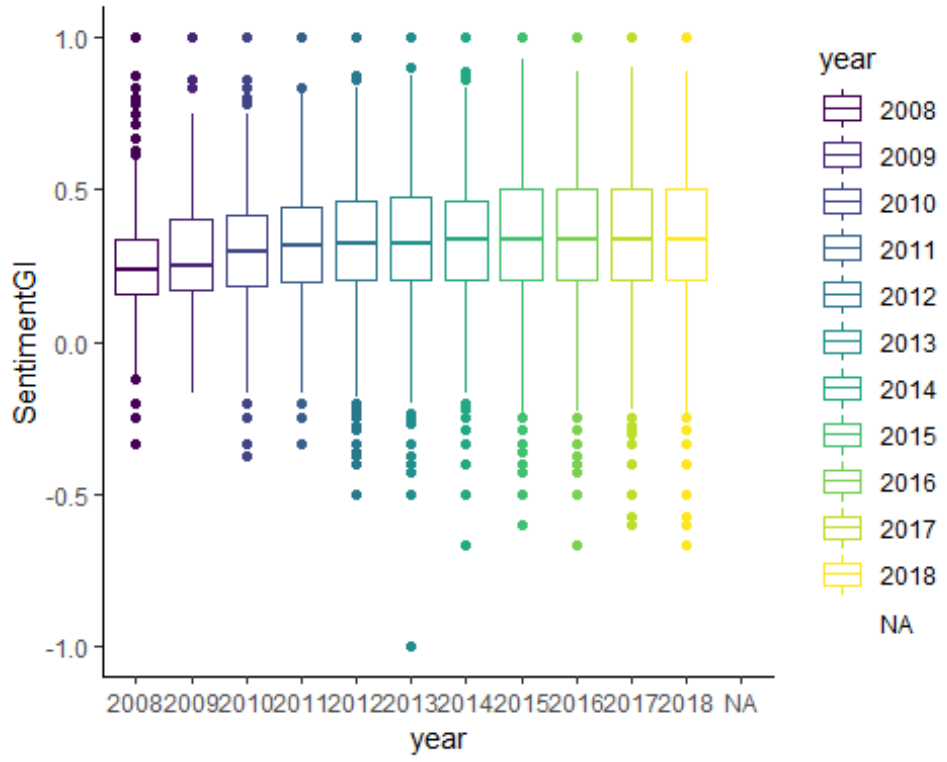



```
#no significant conclusion can be drawn

# plot sentiment over time
abc <-mutate(final,year = factor(year, order = TRUE)) #neg
abc1 <-mutate(final1,year = factor(year, order = TRUE)) #pos
abc2 <-mutate(final2,year = factor(year, order = TRUE)) #sum
abc3 <-mutate(final3,year = factor(year, order = TRUE)) #adv
```

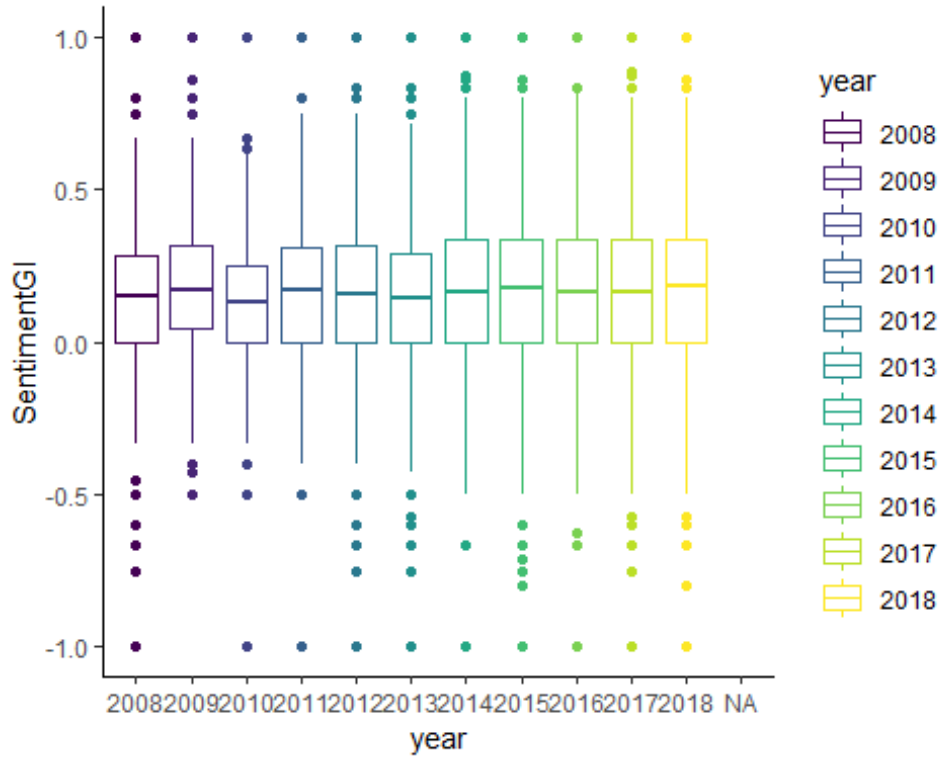
```
#subset(abc, select = c("year", "SentimentGI"))
#data_complete = abc[complete.cases(abc), ]
ggplot(abc, aes(x = year, y = SentimentGI, color = year, rm.na=TRUE)) +
    geom_boxplot() +
    theme_classic()

## Warning: Removed 28 rows containing non-finite values (stat_boxplot).
```




```
ggplot(abc1, aes(x = year, y = SentimentGI, color = year, rm.na=TRUE)) +
    geom_boxplot() +
    theme_classic()

## Warning: Removed 4 rows containing non-finite values (stat_boxplot).
```

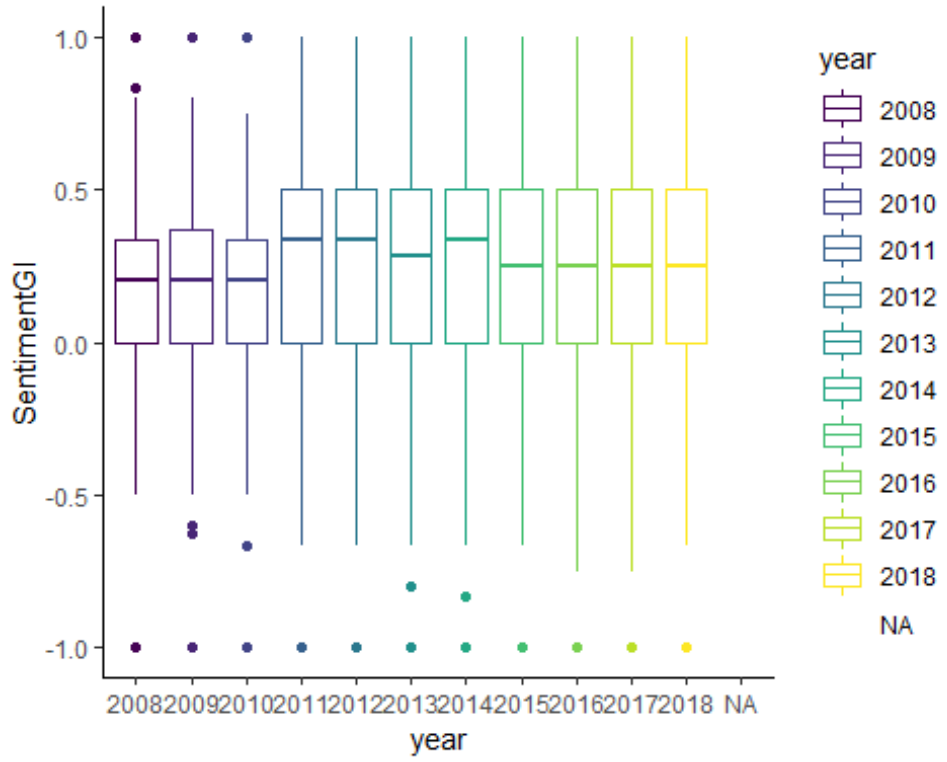



```
ggplot(abc2, aes(x = year, y = SentimentGI, color = year, rm.na=TRUE)) +
    geom_boxplot() +
    theme_classic()

## Warning: Removed 26056 rows containing non-finite values (stat_boxplot).
```




```
ggplot(abc3, aes(x = year, y = SentimentGI, color = year, rm.na=TRUE)) +
    geom_boxplot() +
    theme_classic()
```

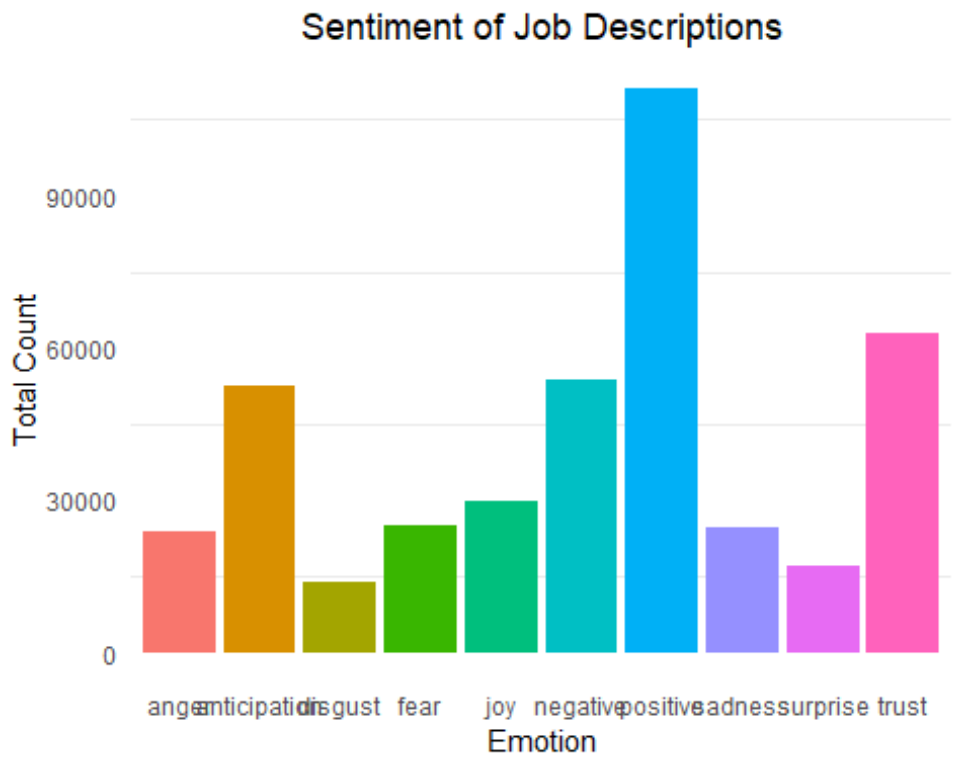
```
## Warning: Removed 737 rows containing non-finite values (stat_boxplot).
```




```
#after plotting for each dataset it is visible that neg more negative, pos more posit
ive
#while summary stays the same, and advice first goes up and then goes far down

sent4 <- get_nrc_sentiment(total$negatives)
sent5 <- get_nrc_sentiment(total$positives)
sent6 <- get_nrc_sentiment(total$advice_to_mgmt)
sent7 <- get_nrc_sentiment(total$summary)
# Let's look at the corpus as a whole again:

tag <- as.data.frame(colSums(sent4))
tag <- rownames_to_column(tag)

tag2 <- bind_cols(total, sent4)
tag2mod <- filter(tag2,negative>25)

tag3 <- bind_cols(total, sent5)
tag3mod <- filter(tag3,positive>25)

tag2mod %>%
  rowwise() %>%
  mutate(
    TotalNeg = sum(c(anger,disgust,fear,sadness))
  )

## # A tibble: 15 x 28
## # Rowwise:
##       ID Place     location  date   status job_title summary positives negatives
##    <int> <chr>     <chr>     <chr>  <chr>  <chr>     <chr>   <chr>     <chr>
##  1 10848 Amazon    "Clarksv~ " Apr~ Curre~ Warehous~ "Dark ~ "- Immed~ "- You w~
##  2 13380 Amazon    "Seattle~ " Nov~ Curre~ Software~ "Stay ~ "- COMPE~ "- WORK-~
##  3 19477 Amazon    "Seattle~ " Apr~ Curre~ Senior S~ "Darwi~ "* Compe~ "* Total~
##  4 21621 Amazon    "Dallas,~ " Jul~ Forme~ Cloud Su~ "AWS C~ "Good re~ "Job Des~
##  5 22030 Amazon    ""        " Jun~ Forme~ Warehous~ "The J~ "I am re~ "I will ~
##  6 22655 Amazon    "Seattle~ " Feb~ Forme~ Senior P~ "Custo~ "If you ~ "My key ~
```

```
##  7 23302 Amazon    "Seattle~ " Jun~ Curre~ Senior B~ "Recip~ "- Many ~ "My revi~
##  8 29523 Amazon    ""        " Nov~ Curre~ Anonymou~ ""      "I defin~ "It's ve~
##  9 34401 Facebook  "Cambrid~ " May~ Curre~ Software~ "Evil ~ "Salary ~ "What to~
## 10 37298 Apple     ""        " Jul~ Curre~ Anonymou~ "App R~ "Having ~ "- Apple~
## 11 37744 Apple     "Cuperti~ " Mar~ Forme~ Software~ "It ha~ "Cool pr~ "I've wo~
## 12 40315 Apple     "New Yor~ " Aug~ Curre~ At        "Lots ~ "Best be~ "With so~
## 13 46960 Apple     "London,~ " Sep~ Forme~ Data Ana~ "Don't~ "The Mon~ "A few m~
## 14 47235 Apple     "Cork (I~ " Feb~ Forme~ Enterpri~ "Anoth~ "You can~ "Let me ~
## 15 55646 Microsoft "Redmond~ " May~ Forme~ Anonymou~ "If yo~ "Relativ~ "* TL,DR~
## # ... with 19 more variables: advice_to_mgmt <chr>, score_1 <dbl>,
## #   score_2 <dbl>, score_3 <dbl>, score_4 <dbl>, score_5 <dbl>, score_6 <int>,
## #   year <dbl>, anger <dbl>, anticipation <dbl>, disgust <dbl>, fear <dbl>,
## #   joy <dbl>, sadness <dbl>, surprise <dbl>, trust <dbl>, negative <dbl>,
## #   positive <dbl>, TotalNeg <dbl>
```

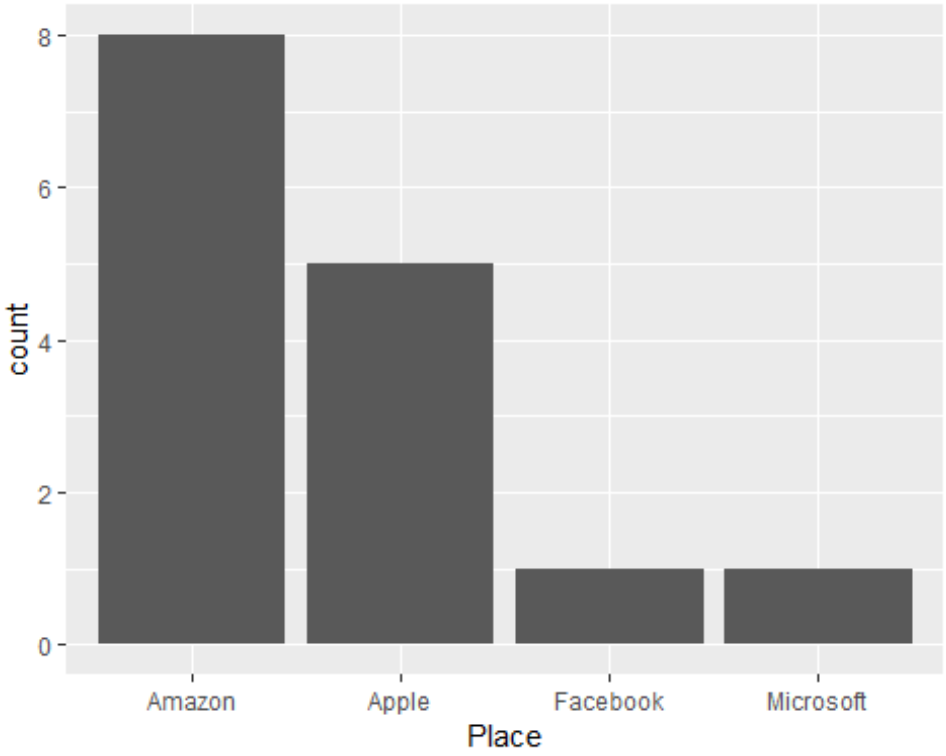
```
colnames(tag) <- c("emotion", "count")
ggplot(tag, aes(x = emotion, y = count, fill = emotion)) + geom_bar(stat = "identity"
) + theme_minimal() + theme(legend.position="none", panel.grid.major = element_blank(
)) + labs( x = "Emotion", y = "Total Count") + ggtitle("Sentiment of Job Descriptions
") + theme(plot.title = element_text(hjust=0.5))
```



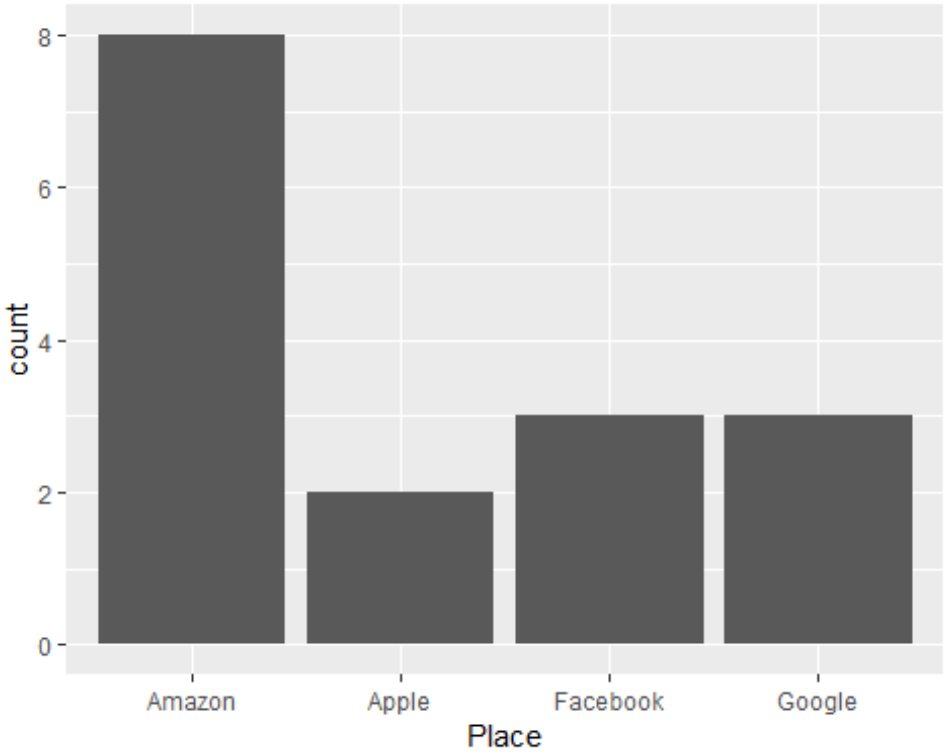

```
head(tag)
```

```
##        emotion count
## 1        anger 23837
## 2 anticipation 52412
## 3      disgust 13755
## 4         fear 25083
## 5          joy 29913
## 6      sadness 24644
```

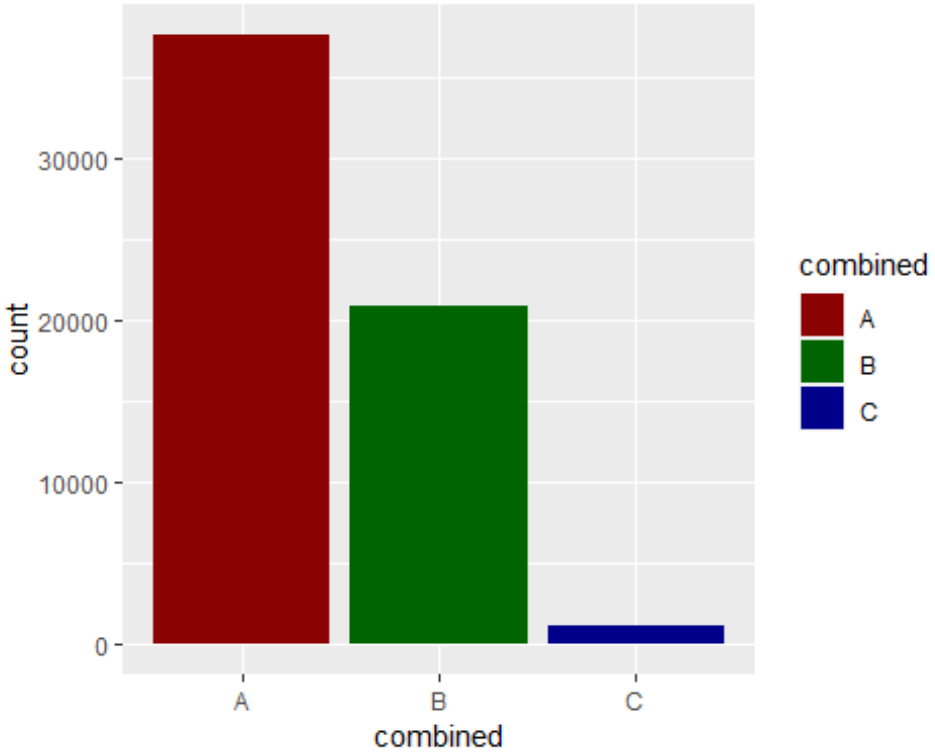
```
 ggplot(data = tag2mod, aes(x = Place)) +
  geom_bar()
```




```
ggplot(data = tag3mod, aes(x = Place)) +
 geom_bar()
```




```
#plot employee hierachy
ggplot(depr_df, aes(x = combined, fill = combined)) +
  geom_bar() + scale_fill_manual(values = c("A" = "darkred", "B" = "darkgreen", "C" =
"darkblue"))
```




```
#nonconclusive because too many unknown (anonymous
```