Variation in Job Titles within the Hospitality Workforce

A computation grounded theory approach

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Abstract— **The wide spectrum of job titles worldwide has become the main cause of confusion amongst the general public, organizations, and practitioners of services. Diversity and inconsistency in job titles have implications for the wider perception of the workforce and their career paths. This study aims to understand the variation in job titles in the hospitality industry for management jobs and propose standardization as a means to combat disparity. A dataset of 1.000 job titles has been collected. This has been analyzed by means of grounded theory and computational grounded theory. The results show a number of 210 standardized job titles. Secondly, computational grounded theory can achieve similar results to grounded theory.**

Keywords-grounded theory; job titles; hospitality.

I. INTRODUCTION

It has become apparent that Human Resource (HR) departments in companies worldwide are dealing with challenges concerning human capital, for example, the war on talent. Therefore, the focus of these departments should be on developing data analytics strategies for training, recruiting, and retaining employees. Moreover, acquiring suitable candidates can be difficult as many success factors, such as skills, international experience, achievements, and education, are considered. Additionally, the challenges concerning the HR department: the lack of digitalization of HR processes, innovation within HR departments, the war on talent, and other challenges, make it all difficult for human resource practitioners to excel in their work.

The term 'HR analytics' has been growing at a fast-paced scale amongst human resource practitioners and consultants in the past years [1]. Furthermore, their research describes the desire of HR professionals to access the "magic numbers" that will support them in combating challenges, such as attrition, talent acquisition, and success predictions. The term "HR analytics" has not been given a precise definition, as there are various opinions on its actual meaning [2]. Van Den Heuvel and Bondarouk (2017) define it as "the systematic identification and quantification of the people drivers of business outcomes, with the purpose to make better decisions" [3]. They focus on analyzing human resource data in a systematic way that could benefit decision-making [4].

To reach the goal of analyzing the career paths of management employees, there is a need for standardization. Standardized job titles, departments, and organizational structures, such as a corporate hierarchy tend to differentiate per business, and therefore it is hard to compare [5], [6]. This complexity shows when viewing the websites of hotel chains, such as Marriot, Hilton, and Accor. These chains provide information about people that fill positions within the board of directors and executive management, how these positions are named and distributed, and differentiate per chain. For example, Marriott has separate presidents for both Canada and the US and a group president for these regions together [7]. Hilton, on the other hand, has one president of the Americas, including North, Central, and South America [8]. Moreover, Accor has a "CEO Lifestyle" function [9], whereas Marriot and Hilton do not have this function. Adding to the complexity is that the websites of these chains do not show a structure concerning the job positions. The same goes for department distribution, as big hotel chains categorize them differently than smaller independent hotels. For example, a smaller hotel may have strictly a finance department, whereas a large chain hotel might have separate departments for accounts payable, accounts receivable, budgeting and forecasting, and so on. Likewise, some companies work with a wide variation of job titles that are created just to make an employee happier with their position and title within the company. This forms a large web of titles that are similar and often mean the same thing; therefore, standardized versions of these company structural components are necessary to facilitate the Human Resource process in recruiting and managing talent. If given the means, an HR recruiter would be more effective in analyzing career paths and recruiting the right candidates.

In order to create the pattern libraries, the following research question has been formulated: "How to build pattern libraries that support the open and axial coding of computational grounded theory?" In our research, several products will be built which are defined by the type of coding involved. More specifically, a pattern library for standardizing job titles will be created using open coding, whilst axial coding will define pattern libraries at a department's and hierarchical level.

Section II of this paper describes the research methodology, followed by Section III which will go more in-

depth about the data collection and analysis. In Section IV the results of the open and axial coding are written. To continue, limitations can be found in Section V Ending with Section VI where it mentions further research and lastly the Acknowledgements are mentioned.

II. RESEARCH METHODOLOGY

The goal of this research is twofold. The first goal is to identify similarities and dissimilarities in job titles across different lodging enterprises with the objective to formulate a set of standardized job titles. In addition to the goal of the research, also, the maturity of the research field is a factor in determining the appropriate research method and technique. With regards to job titles, this research field is mature. An appropriate focus of research in mature research fields is formal hypothesis testing or reevaluating existing methods[10]. Summarized, to accomplish our research goal, a research approach is needed in which job titles are identified and compared. To accomplish this goal, grounded theory is applied. In total, three cycles of coding were followed: 1) open coding, 2) axial coding and 3) selective coding [11].
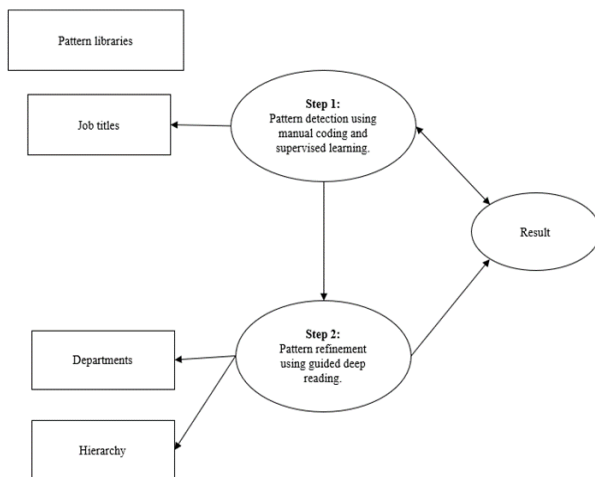

Figure 1.   Computational Grounded Theory Model.

The goal of open coding is to create the first level of abstraction from analyzed data. This is realized by analyzing data and merging found instantiations to high-level categories. Identifying more precise categories and relationships among the high-level categories is the goal of axial coding. In our study, axial coding focused on identifying the standardized job titles. Selective coding was conducted to select the core category, relating categories and filling in categories that need further refinement[11]. In our research, this means that standardized job titles are appointed to departments and hierarchy levels. Then, to increase the generalizability 72 round of automated coding through computational grounded theory have been applied [12]. In Figure 1, the process is visualized with the first step resulting in the creation of the pattern library for job titles. This step involves the exploration of text using unsupervised methods and manual coding. Following a chronological order, step 2 will result in the development of the departments and hierarchy which are in

essence a cumulus of categories for the job titles. In this phase, guided deep reading facilitates the interpretation of patterns. This is because the researchers can evaluate their analysis of the patterns determined quantitatively in step 1. They can detect whether the patterns are interpreted in a meaningful way and either confirm or reconsider initial patterns [12]. These are also thoroughly analyzed through the means of inter-rater reliability analysis and later translated into text which can be understood by the computer. Inter-rater reliability is a process in which coders/raters consistently distinguish between different items on a measurement scale, with the purpose of analyzing variations between ratings [13]. After both steps have been completed, the testing phase has started which creates rigorous and fully reproducible pattern libraries, measured by an F1 score. The process and results for each stage of coding are discussed in the following section.

III. DATA COLLECTION AND ANALYSIS

Grounded theory states that the first selection of respondents and documentation is based on the phenomenon studied at a group of individuals, organizations, information technology, or *community that best represents this phenomenon* [14]. For the goal of this study, this means the job titles managers use to describe their current job. Therefore, for this study, one real-life data set has been collected from Hospitality.net, between the 1st of June and the 15th of January 2021. The preprocessing of the data involved scraping the raw text descriptions into a .csv file. In this file, the information was sorted by date, job titles and gender, which supported creating the pattern libraries. No further alterations were made, as the goal was to have the data as raw as possible. The method of data collection involves a partially random stratified sampling for the entire population of job postings of management employees, during the period mentioned previously. This population, in the first phase of our data collection, has been divided into different strata depending on job title, level, company, and geographical location. For every strata, several job postings have been scraped and analyzed, totalling 1652 job titles by open coding. Starting from "date emails", the sampling method has been changed. The following phase involved letting the system scrape data and showing the results by means of an automated generated email. The system would scrape newly identified job titles and mention the standardized version. The role of the researchers was to check the accuracy of the system and to standardize new job titles if they were not yet in the system.

First, the patterns with the largest N were added, with N being the number of words in a pattern. For example, the job title pattern "Finance and Accounting Director" has an N of four with the label "Director of Finance". At all times, there is at least one pattern guarantee to match a newly identified job title. If there is no match with a pattern, the job title will be classified as a 999, which is always diverted to the researchers who will either create or assign a label to it.

A. Open Coding

The pattern library for the job titles was created first as it served as a basis for the other two pattern libraries. Hereby the first layer in coding, open coding, was used. In practice, open coding is used to "organize similar words and phrases, concept-indicators, in broad initial thematic domains" [15]. The coding scheme used was designed a priori which was then translated into a code-book/business rules that were then used to hermeneutically categorize the text. Three primary researchers first manually coded the text, whereafter a fourth secondary researcher assessed the coding. The background of the primary researchers encompasses four years of a Bachelor's in Hospitality Industry, with the fourth researcher having more than 10 years of experience in the industry and a PhD in Business Informatics. After, an inter-coder reliability score was measured. An example of one of the standardized job titles is 'CEO', 'New company CEO,' and 'Chief executive Officer' which will be standardized into 'Chief Executive Officer' as a job title. Once this score was satisfactory, the coding of the job titles is translated into patterns that are added into a named entity recognition whereafter the retrieved job titles are automatically coded. If a job title couldn't be coded the system would notify the three coders so that they could add coding to them. In addition, the coders checked the automated codes to see if the system coded the proper elements.

B. Axial coding

Going forward with the axial coding, the pattern library job title is being used as the basis of the other two pattern libraries: 1) Department and 2) Hierarchy. For the axial coding, it has followed the same structure as the open coding by first categorizing the standard job titles by hermeneutic skills and expert opinion, checking this by inter-rater analysis, and by coding it separately. For example, 'Chief Executive Officer' is part of the administrative department; 'Finance Director' is part of the finance department, and 'Director of Human Resource' is part of the human resource department. After completing this process, the axial coding has been automatized by creating the pattern libraries.

IV. RESULTS

The application of the Computational Grounded theory model has resulted in the creation of three pattern libraries. The precision and recall of these products are measured based on a calculated F1 score. Furthermore, the gradual development process is described in the following section.

A. Pattern library for job titles

The results of categorizing the job titles into a pattern library are 210 standardized job titles. Moreover, inter-rater reliability has been applied to ensure rigorous research. This resulted in an inter-rater reliability score of 83,0%. Furthermore, of the percentage of faulty coding, 84.4% were incorrect due to variation in writing; for example, to label the job title 'board of directors, one coder may write

'member of the board of directors', while another writes 'board of directors. On the other hand, 15,6% were more significant faults where titles were labeled entirely differently. An example of this would be labeling the pattern 'pastry chef'. Whereas one would label it as 'chef de cuisine', making it more general, another would keep it specific and label it as 'pastry chef. After this process, more business rules were added, finalizing with 14 rules. Following this, an F1 score was calculated to measure the precision and recall of the pattern library. The pattern library for job titles attained a
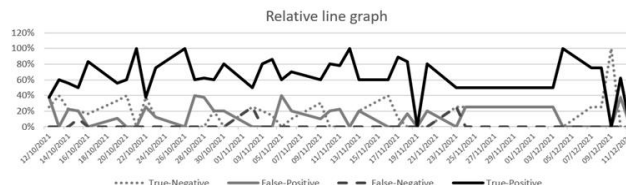
perfect score of 100% after having been observed over 72 times throughout the research.

TABLE I. PRECISION MATRIX

	Positive	Negative
Positive	188 (TP)	47 (FP)
Negative	3 (FN)	48 (TN)

Figure 2. Precision matrix line graph

Whilst the patterns and corresponding labels were in the server, daily e-mails were received, which contained about zero to ten newly identified job titles per day and stated what label had been given to this title. The e-mail shows job titles that have been coded and job titles that have not been coded. For those that had not been coded, new patterns were created. The job titles that were coded were checked against the classification of labeling. In Figure 2, the relative amount of job titles and the outcome of the classification of the labeling is pictured on a timeline, followed by Table 1 which shows the total of newly identified job titles after the pattern library has been created. As seen in the graph, the largest amount was true positives, followed by true negatives, false positives, and finally false negatives.

B. Pattern library for departments

The results of the job title pattern library served as an input for the creation of the department's pattern library and therefore, followed step 2 of Figure 1. During this phase, all the standardized job titles have been categorized per department. This resulted in a count of 17 departments for 210 job titles. To define these departments, inter-rater reliability has been applied by a total of 5 coders starting with conceptualizing a draft version of departments and developing a set of 9 business rules. These business rules have helped the coders define mutually exclusive, qualitative, and complete categories which range from Administrative to Wellness and Recreation. The total number of categorized job titles into departments during inter-rater reliability is 100, representing 10% of the data set at hand. For example, 'Chief Executive Officer' is part of the administrative department.

After the manual process has been finalized, the pattern library has been tested through the means of computation. From the 15th of October until the 15th of January, the pattern library is tested daily to validate the completeness and usefulness against newly identified job titles. If the pattern library cannot recognize what department to classify a standardized job title, the title will be added to the library. This way, the pattern libraries will continuously be developed. For this pattern library, the daily calculated F1 score of the pattern libraries was 100%, meaning that the precision and recall of the pattern library for standardized departments is perfect. Like the job titles, the pattern and label file for the departments was updated when new patterns were discovered. As this pattern library is based on the pattern library for job titles, the outcome of the positives/negatives was the same.

TABLE II. JOB TITLES OVERVIEW BY DEPARTMENTS

Department	Count of Job Title
Administrative	23
Asset Management	3
Business Development Strategy	30
Corporate Affairs	13
Customer Experience	5
Engineering	2
Engineering	2
Events	6
Finance and Accounting	9
Food and Beverage	21
Human Resources	10
Information technology	7
Operations	13
Revenue Management	8
Rooms Division	5
Sales and marketing	29
Wellness and Recreation	3
Other	21
Grand Total	210

C. Pattern Libraries for hierarchy

The creation of the pattern library hierarchy resulted in three base hierarchy levels. As an organization can be divided into head office (HQ), regional office (RO), and property-based (PB) job levels. Within the HQ level, 26 patterns have been categorized. In RO there are 88 patterns and PB 97 patterns. This resulted in an organizational standardized structure, where "X" refers to the specific job title or department, as for example "Director of Finance". See Figures 3, 4 and 5.

The hierarchy starts with Head Quarters and ends with Property-Based. As every organization is different it was needed to create more detailed levels to place job titles with a similar name in the same hierarchical level. The number shows the level in the hierarchy, where one is the highest, and anything that follows is lower in ranking. The Chief Financial Officer, Chief Human Resource Officer, and Chief Sustainability Officer all come on the same level: HQ1. Followed with HQ2 the President and will go to HQ7. This example explains the details of the standardized hierarchical levels of the Head Quarters, there are also detailed levels for the Regional Office: RO1 being the Group Directors,

followed by the Area/Regional Executive Vice Presidents. This goes on till RO8. And Property-Based: PB1: General Manager, followed by the Assistant General Manager on PB2, Going on to the managerial level PB8.
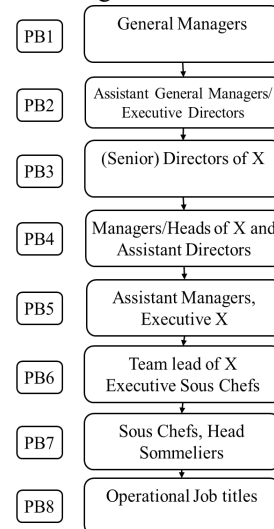
PB1	General Managers
PB2	Assistant General Managers/ Executive Directors
PB3	(Senior) Directors of X
PB4	Managers/Heads of X and Assistant Directors
PB5	Assistant Managers, Executive X
PB6	Team lead of X Executive Sous Chefs
PB7	Sous Chefs, Head Sommeliers
PB8	Operational Job titles

Figure 3.   Property-Based Hierarchy Levels

RO1	Group Directors
RO2	Area/Regional Executive Vice Presidents
RO3	Area/Regional (Senior) Vice Presidents
RO4	Area/Regional Executive Directors
RO5	Area/Regional (Senior) Directors
RO6	Area/Regional/Country Managers
RO7	Cluster/Multi-Property Directors
RO8	Cluster Managers

Figure 4.   Regional Office Hierarchy Levels

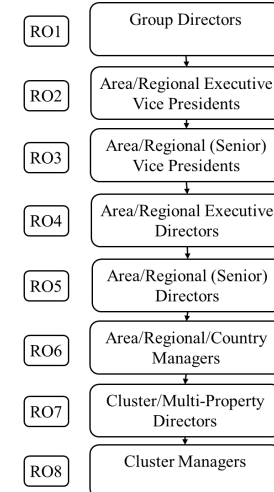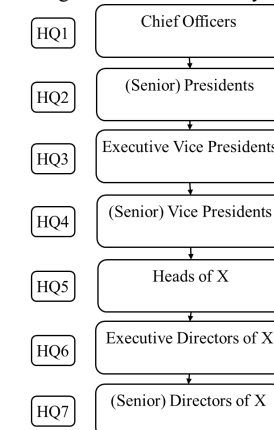|	
HQ1	Chief Officers
HQ2	(Senior) Presidents
HQ3	Executive Vice Presidents
HQ4	(Senior) Vice Presidents
HQ5	Heads of X
HQ6	Executive Directors of X
HQ7	(Senior) Directors of X

Figure 5.   Headquarters Hierarchy Level

For this result, the researchers interviewed four international experienced professors of Hotel Management School Maastricht to validate the hierarchical structure created. The insights given as a response were evaluated based on inter-rater reliability. The result was a score of 82%, meaning that 18% of the answers given amongst the professionals were different. For the 18% of the answers that were different a total of 7 business rules were created. The result of the F1 score of this pattern library also equaled 100%, meaning that this Axial coding recognizes all the existing patterns of the open coding.

V. LIMITATIONS

As this paper has a global scope of analyzing job titles worldwide, it was more difficult to execute during this time period, therefore there were time constraints. Other than that, this research was executed as a cross-sectional study, meaning that longitudinal research is needed to find changes over time to identify trends and adjust this within the patterns. The third limitation is the human bias, due to cultural backgrounds or other interpersonal factors of the researchers that affect the study's validity. This has been reduced because of the inter-rater results. The fourth and last limitation is the sampling technique used in this research. Hospitality.net has been used as sample data that has to be representable for the entire population.

VI. CONCLUSION AND FURTHER WORK

The application of data analytics, measures and, tools has facilitated the process of creating the pattern libraries and, it proves that digitalization in the hospitality industry can be a key tool for solving business problems.

These findings provide a potential mechanism for further development in creating standardization for job titles in the Hospitality industry, in order to combat disparity. Moreover, this paper draws attention to the gaps in the industry, such as the lack of digitalization and innovation in the Human Resources department. The next recommended step would be to compare the findings with similar initiatives in the industry, such as Esco. This enterprise classifies skills, competencies and occupations within the European Union's labour market, which serves a similar scope to the research proposed in his paper [16]. Furthermore, additional resources could be devoted to analyzing the impact certain variables have on job title disparity, such as gender, education, skills and background. On a practical level, the hospitality industry could use all these findings to create a digital platform for businesses worldwide which can compare job titles by department, hierarchy and additional variables as per user preference.

ACKNOWLEDGEMENT

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