

# A Study of Motivation and Job Redesign in the Americas Using the Hackman and Oldham Job Characteristics Model

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## **ABSTRACT**

This study of the Job Characteristics Model centers on companies in both manufacturing and service industries located in North America, Central America and South America. Results of United States companies are compared to those of non-US firms. Scores were calculated for each of the five dimensions of the model and the motivation potential score. For comparison purposes, scores for all companies studied were compared to those in the Hackman and Oldham database. It appears cross-cultural differences may help to explain the findings.

Key words: Job characteristics model, motivation, job redesign, skill variety, task identity and significance, autonomy, feedback, outcome, international, and culture.

## **INTRODUCTION**

In today's increasingly competitive, global environment, aggressive strategies by companies to lower costs and increase margins often result in unintended consequences in terms of employee motivation and morale. Hackman and Oldham (1976) developed the Job Characteristics Model (also known as the Hackman and Oldham Model) to determine how job characteristics and individual differences interact to affect the overall satisfaction, motivation, and productivity of individuals at work. The model is helpful in planning and carrying out changes in the design of jobs. In developing the Model, Hackman and Oldham built upon the foundation of Herzberg's two-factor theory (Herzberg, Mausner and Synderman, 1959) with some theoretical foundations based on the expectancy theory (Evans, Kiggundu and House, 1979).

## **REVIEW OF THE LITERATURE**

What motivates an individual to perform at his or her best? This question has intrigued management and inspired much research and interest. For Hackman and Oldham, the answer to the above question focused on job design and its interaction with the motivation of the individual.

The Hackman and Oldham model was developed to specify how job characteristics and individual differences interact to affect the satisfaction, motivation, and the productivity of individuals at work. The model is specifically used in planning and carrying out changes in the design of work. Several studies have supported the theory of motivation through job redesign (Ford, 1969; Lawler, 1973; Maher, 1971; Meyers, 1970; Special Task Force, HEW, 1973; Vroom, 1964). Studies of job redesign have found that this technique is able to (1) significantly reduce turnover and absenteeism, (2) improve job satisfaction, (3) improve quality of products, and (4) improve productivity and outputs rates (Steers and Porter, 1987).

Several researchers started the job redesign movement (Walker and Guest, 1952; Herzberg, 1966; Davis, 1957; Herzberg, Mausner and Snyderman, 1959). Job redesign has become a useful tool in developing ergonomic programs, resulting in increased motivation and fewer injuries (Mier, 1992). Using job redesign to introduce technology into the workplace will be very important in the 1990's for there will be a shift from a tightly controlled management structure with narrowly defined jobs to a style that gives employees satisfaction, thus increasing motivation (Iadipalo, 1992).

Work redesign is a unique approach to motivation and company reorganization for four reasons: (1) work redesign alters the basic relationship between a person and what he or she does in the job; (2) work redesign directly changes behavior, which tends to stay changed; (3) work redesign offers and sometimes forces into one's hands numerous opportunities for initiating other organizational changes; and (4) work redesign, in the long term, can result in organizations that rehumanize rather than dehumanize the people who work in them (Hackman, 1977). The entire concept of job redesign is based upon the theories of motivation and the motivation literature.

Motivation may be defined as psychological forces that determine the direction of a person's level of effort, and a person's level of persistence in the face of obstacles (Kanfer, 1990). Or motivation is simply, why people behave as they do on the job. Motivation stimulates people to do things with the use of inducements and incentives. People are motivated to reach an objective only if they feel it is in their best interest to do so (Bernard, 1938).

Trends in motivation seem to be in the area of job redesign to determine why people work and what really motivates an employee or manager (Kovach, 1987). The theories of motivation are still being utilized to better understand and motivate people. They have been tested and utilized in a variety of cultures (Geert, 1980). Job performance and its relationship to motivation have continued to be an important issue of study (Katerberg and Vkaaym, 1987).

Motivation theory has evolved into two distinct categories, content theories and process theories. Content theories focus on the importance of the work itself and the challenges, growth opportunities, and responsibilities work provides for employees. Thus, those theories concern the content of motivation, i.e. the specific needs that motivate and direct human behavior. On the other hand, process theories concern the cognitive processes individuals use in making decisions and choices related to work (Schultz and Schultz, 1998). Consequently, Hackman and Oldham's Job Characteristics model is a process theory of motivation.

Recent studies of the JCM have tended to focus on two general questions: (1) does the model apply to non-manufacturing jobs (e.g., service, sales, health care)? (2) Are there mitigating factors which may apply to work settings outside the United States? Some studies have explored these questions simultaneously.

Several recent studies have explored the first question alone. In the United States, the usefulness of the JCM has been validated in studies of information technology professionals (Brown, 2002), public school teachers (Fernandez, 2002), and hospital workers (Casey and Robbins, 2009). Other studies have been conducted outside the U.S., albeit in areas with a similar

culture and society. One researcher administered the JDS to hotel workers in the United Kingdom (Lee-Ross, 1998) and to hospital chefs in Australia (Lee-Ross, 2002). In both cases the results indicated that the JCM was valid in a service setting.

Several studies have been conducted using the Job Characteristics Model in international settings. A study in Belgium of public service workers found that administrative tasks (more routine and clerical in nature) held less motivating potential than commercial tasks (those tasks more closely associated with accomplishing the mission of the organization), due to lower levels of the core job characteristics (Buelens and Van den Broeck, 2007). A study in Malta focused on the level of motivation of public service workers (PSM); this study found that employees who experience positive job characteristics, as measured by the JDS, have a higher PSM level (Camilleri, 2005). Elanain (2008), in a study of both manufacturing and service companies, found employees are impacted by increasing the provision of the critical job characteristics; employee satisfaction and commitment can be increased and turnover can be decreased as a result.

A Netherlands study in the financial services and educational areas found support for the hypothesis that work characteristics are a direct cause of job motivation and satisfaction (Houkes, Janssen, Jonge and Bakker, 2003). Another study proposed that critical job dimensions would be lower for Mauritian workers than for Australian, i.e., work content would be perceived differently due to cultural differences (Lee-Ross, 2005). Using the JDS to measure work content, the author found that Mauritian workers scored lower on all five of the critical job dimensions.

Michailidis and Dracou (2011) studied Cyprus sales representatives and found the MPS score was significantly related to three characteristics—educational level, age, and tenure. Educational level and age were inversely related, while tenure was directly related. Millette and Gagné (2008) found support for the hypothesis that the MPS (job satisfaction) was positively associated with autonomous motivation (defined as internal motivation) among volunteers in a health care organization. The authors also found support for the hypothesis that MPS was positively associated with volunteer work satisfaction. Sadler-Smith, El-Kot and Leat (2003) found the work criterion, autonomy, was associated with job satisfaction in a non-Western context (Egypt) through a manufacturing facility study.

A study of educational institutions in Germany (Schermully, Schermuly and Meyer, 2011) found that job satisfaction was highly and inversely related to emotional exhaustion. The authors also found that satisfaction was predicted best by perceived competence of the subjects (in this case, vice-principals of the institution).

Among various service workers in Canada, Mexico and the Netherlands, researchers found that job satisfaction is affected by external factors such as cultural influences (Sledge, Miles and van Sambeek, 2011). Wong, Hui and Law (1998) found that overall and intrinsic job satisfaction is reciprocally related to job perception among service workers in China.

## **HYPOTHESES**

The researchers developed the following hypotheses to determine if a significant difference exists between US and non-US companies.

Ho: There is no statistically significant difference among the United States and non-US survey results.

Ha: There is a statistically significant difference among the United States and non-US survey results.

## METHODOLOGY

A convenience sample of three U.S. companies was selected for study.

<b>US Companies</b>			
	Total Employees	Sampled	Response Rate
Manufacturing Plant	1000	192	19.2%
Retail	534	330	62%
Service	300	89	30%
Total	1834	611	33%

<b>International Companies</b>			
	Total Employees	Sampled	Response Rate
Bank Nicaragua	600	233	39%
Bank Guatemala	380	152	40%
Food Service Nicaragua	150	108	72%
Small Businesses Mexico	274	175	64%
Bank Costa Rica	52	28	54%
Belize Retail	36	15	42%
Honduras Retail	385	158	41%
El Salvador Retail	786	354	45%
Ecuador	402	157	39%
Total	3065	1380	45%

All of the studies above utilized the Job Diagnostic Survey (JDS). Employees completed the Job Diagnostic Survey (JDS) instruments which were sealed in envelopes then collected at a central location and returned to the researchers. The survey instrument was scored, with results compared to each other and to the Hackman and Oldham database. A two-tailed t-test was used to determine if a significant difference exists between the samples. The level of significance was placed at  $<.05$ .

In each case, the researchers obtained the permission of the companies to conduct the surveys. For the non-US sites, the researchers translated the surveys into Spanish and developed a letter explaining the survey and letting the employees know that individual responses would remain anonymous. The survey instrument translation and letter were certified for both the translation of the survey questions as well as the implied intent.

## **INSTRUMENTATION**

The Job Diagnostic Survey (JDS) is an instrument designed to measure the key elements of the job characteristics theory. The survey measures several job characteristics, employees' experienced psychological states, employees' satisfaction with their jobs and work context, and the growth need strength of respondents. The instrument has a variety of scales depending on the section. Sections one through five utilize a 7-point scale. Section six utilizes a 10-point scale, and sections seven and eight utilize a 5-point scale.

The JDS is designed to be completed by the incumbents of a job or jobs in question-not by individuals outside the job. An instrument designed for the latter purpose is entitled the Job Rating Form (JRF) and is completed only by management personnel. The Job Rating Form uses a 7-point scale for all three sections.

The JDS is not copyrighted and, therefore, may be used without the author's permission. However, the researcher did send letters to the authors asking for permission to use the instrument and purchased a copy of the instrument from the Educational Testing Service in Princeton, New Jersey. A short form of the JDS has also been developed. It excludes measures of the experienced psychological states and uses fewer items to measure other key variables in the job characteristics theory. The long form was used for this research.

## **RELIABILITY OF THE INSTRUMENTS**

The Job Diagnostic Survey is intended for use in (a) diagnostic activities to determine whether (and how) existing jobs can be improved to increase employee motivation, performance, and satisfaction; and (b) evaluation studies of the effects of work design.

Since the JDS was originally published (Hackman and Oldham, 1974 and 1975), the instrument has been used in many organizations and subjected to several empirical tests (Cathcart, Goddard, and Youngblood, 1978; Dunham, 1976; Dunham, Aldag and Brief, 1977; Oldham, Hackman and Stepina, 1979; Pierce and Dunham, 1978; Stone, Ganster, Woodman and Fuslier, in press; Stone and Porter, 1977; Barr and Aldag, 1978).

Experience with the JDS, and studies of its properties, have highlighted a number of limitations and suggest several cautions in using the JDS survey instrument (Hackman and Oldham, 1980). The Job Characteristics, as measured by the JDS, are not independent of one another. When a job is high on one characteristic (such as skill variety), it also tends to be high on one or more others (such as autonomy and/or feedback). The positive intercorrelations among the job characteristics may reflect problems in how they are measured in the JDS. Alternatively,

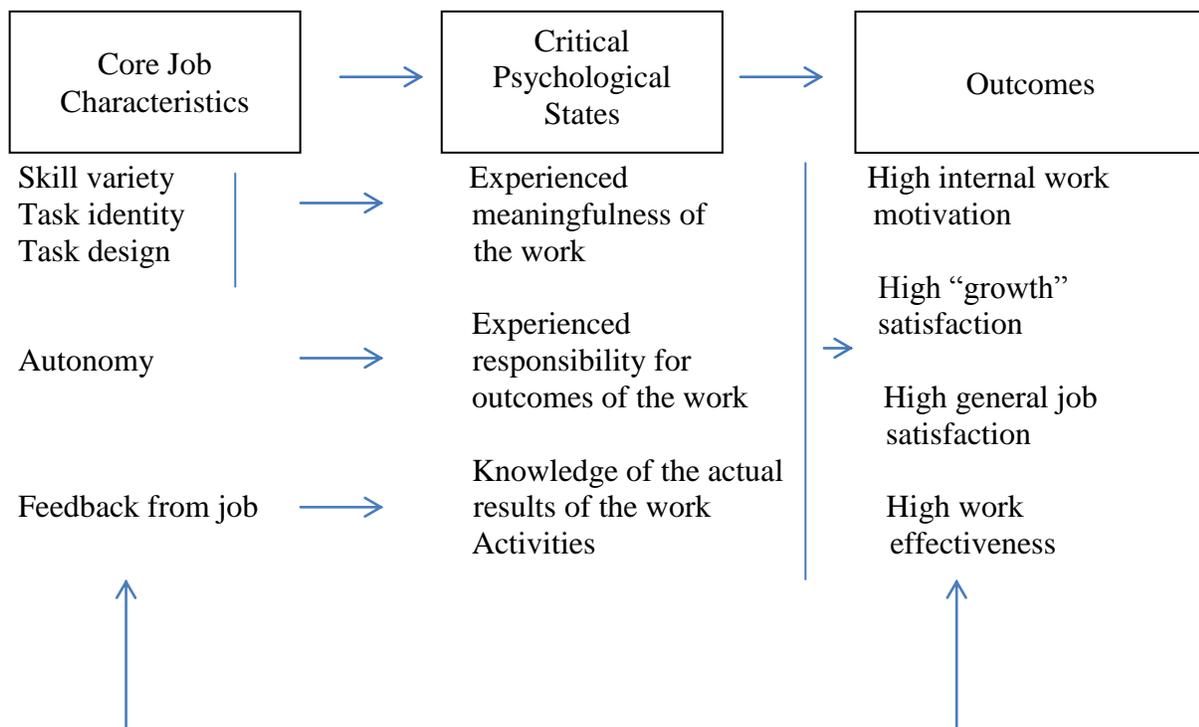
it may be that most well-designed jobs are high on most or all of the job characteristics, and jobs that are poorly designed tend to be low on most or all of the job characteristics. Hackman and Oldham are not certain if it is an instrument problem or an ecological phenomenon to over interpret JDS scores for any single job characteristic considered. The developers of the instrument suggest that it is preferable to simply add the scores of the five motivating job characteristics to arrive at an overall estimate of formula for the motivating potential score (MPS) rather than to compute scores individually. The advantage of the MPS score is that it derives directly from the motivational theory on which the JDS is based. The range for the MPS is 1 (lowest) to 343 (highest). Consequently, jobs with high MPS scores are more likely to motivate workers whereas jobs with low MPS scores fail to motivate workers and may be good candidates for job redesign. The model is presented graphically below. This model was adapted from Hackman and Oldham 1980 model.

Hackman and Oldham (1980) found that internal consistency reliabilities range from a high of .88 (growth need strength, in the “would like” format) to a low of .56 (social satisfaction) to .28 (growth satisfaction). Generally, the results suggest that the validity of the items are satisfactory. While it is to the credit of the instrument that it discriminates well between the job (and families of jobs), more research is required to relate a concept to other variables and firmly establish the meaning of the concept.

The substantive validity of the instrument has been established (Hackman and Oldham, 1974) and the job dimensions themselves are intercorrelated as found by Hackman and Lawler (1971), Hackman and Oldham (1974), and Taber and Taylor (1990).

**FIGURE 1**

**THE HACKMAN AND OLDHAM MODEL OF JOB REDESIGN AND MOTIVATION**



Moderators

1. Knowledge and skill
2. Growth need strength
3. “Context” Satisfaction

Motivating potential score (MPS) =

$$\left[ \frac{\text{Skill variety} + \text{Task identity} + \text{Task significance}}{3} \right] \times \text{Autonomy} \times \text{Feedback}.$$

**RESULTS**

On the next page, Table 1 compares three studies conducted by the researchers in the United States in the manufacturing, retailing and hospital industries. The table also reflects the means of the research for the manufacturing and sales industries in the United States as calculated by Hackman and Oldham from the studies they conducted. Table 2 reflects six non-US studies in two banks (service industry in Nicaragua and Guatemala), a food service company in Nicaragua, several small businesses in Mexico, a bank in Costa Rica and a retail outlet in Belize. The tables display the scores for the core job characteristic of the model. Those core characteristics are: skill variety, task identity, task significance, autonomy and feedback. The table also reflects the motivating potential score (MPS) for each of the research studies.

**TABLE 1**

**MEANS FOR THE STUDIES IN THE SERVICE, MANUFACTURING AND RETAIL INDUSTRIES UNITED STATES**

Dimensions	Hackman & Oldham Mean for Sales Industry	Hackman & Oldham Mean for Manufacturing Industry	United States Study #1 Manufacturing Company	United States Study #2 Major Retailing Company	United States Study #2 Hospital (Service)
			n=192	n=330	n=89
Skill Variety	4.80	4.20	4.89	4.46	4.05
Task Identity	4.40	4.30	3.94	5.25	3.89
Task Significance	5.50	5.30	5.31	5.59	4.48
Autonomy	4.80	4.50	4.67	5.30	3.56
Feedback	4.44	4.70	4.07	4.05	3.36
Motivating Potential Score	104.52	97.29	89.59	109.47	49.52

**TABLE 2**

**MEANS FOR THE STUDIES IN THE SERVICE, MANUFACTURING AND RETAIL INDUSTRIES NON-US**

Dimensions	Non-US Study #1 Bank in Nicaragua (Service) n=233	Non-US Study #2 Bank in Guatemala (Service) n=152	Non-US Study #3 Food Service Nicaragua n=108	Non-US Study #4 Small Service Businesses in Mexico n=175	Non-US Study #5 Bank in Costa Rica n=28	Non-US Study #6 Retail in Belize n=15	Non-US Study #7 Retail in Honduras n=158	Non-US Study #8 Retail in El Salvador n=354	Non-US Study #9 Retail in Ecuador n=157	Averages
Skill Variety	3.77	3.71	3.70	3.77	4.03	3.52	3.72	3.74	3.87	3.76
Task Identity	3.01	3.35	3.62	3.95	4.21	3.72	4.07	3.27	3.44	3.64
Task Significance	2.50	3.10	3.17	3.70	3.35	4.01	4.32	3.29	3.44	3.46
Autonomy	2.86	2.72	3.88	3.70	3.85	3.70	3.68	3.13	3.32	3.43
Feedback	3.50	3.48	3.95	3.70	3.24	3.31	3.17	3.12	3.72	3.53
Motivating Potential Score	31.79	32.05	53.53	52.05	48.20	45.93	47.09	33.53	44.26	43.92

A formula was utilized to compute each of the scores. Potential motivating potential scores range from one to 125. The MPS provides a good indication of those job characteristics which could be enhanced to improve motivation.

The MPS for the manufacturing company and the retailing company in this research are comparable to the means in the Hackman and Oldham database. The MPS for the hospital does not have a comparable mean in the Hackman and Oldham database. In addition, the MPS for the Central American banks, the food service company in Nicaragua as well as the small service businesses in Mexico are comparable to the hospital, but significantly below the Hackman and Oldham mean for the sales industry.

Table 3 reflects the mean scores for the United States versus non-United States companies in this sample. The researchers found that the overall MPS for US companies was 90.08 versus 44.92 resulting in a variance of 45.16. The two dimensions that had significant differences were task significance and autonomy.

**TABLE 3**

**MEANS FOR THE UNITED STATES VERSUS NON-US STUDIES**

Dimension	Average for US Companies	Average for Non-US Companies	Variance
<b>Skill Variety</b>	4.48	3.76	.72
<b>Task Identity</b>	4.36	3.64	.72
<b>Task Significance</b>	5.24	3.46	1.78
<b>Autonomy</b>	4.57	3.43	1.14
<b>Feedback</b>	4.12	3.53	.59
<b>Motivating Potential Score</b>	90.08	44.92	45.16

**DISCUSSION AND CONCLUSIONS**

The researchers postulate that culture may be a reason for the differences in the scores. The researchers performed a one-factor ANOVA to determine the variation between the subgroups; the results are shown in Table 4. Since the analysis the F value of 7.82614 was larger

than the F critical of 1.99458 the researchers rejected the null hypothesis and concluded there is a statistically significant difference between the US and non-US companies.

**TABLE 4**

**ANOVA: ONE-FACTOR TEST**

**Anova: One-Factor  
SUMMARY**

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
<b>Hospital in US</b>	5	19.34	3.868	0.19027
<b>Retail in US</b>	5	24.65	4.93	0.41755
<b>Manufacturing in US</b>	5	22.88	4.576	0.32668
<b>Bank in Nicaragua</b>	5	15.89	3.178	0.19167
<b>Bank in Guatemala</b>	5	16.35769	3.271538	0.144535
<b>Food Service in Nicaragua</b>	5	18.35	3.67	0.08925
<b>Small Business in Mexico</b>	5	18.82	3.764	0.01173
<b>Bank in Costa Rica</b>	5	18.68	3.736	0.17978
<b>Retail in Belize</b>	5	18.26632	3.653264	0.066924
<b>Retail in Honduras</b>	5	18.9596	3.791932	0.189791
<b>Retail in El Salvador</b>	5	17.15	3.43	0.07885
<b>Retail in Ecuador</b>	5	17.9	3.58	.04795
				1.935805

**ANOVA**

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
<b>Between Groups</b>	13.88739	11	1.26249	7.82614	1.49E-07	1.99458
<b>Within Groups</b>	7.743221	48	0.161317			
<b>Total</b>	21.63061	59				

The researchers then performed an analysis of variance for both the US and Non-US companies; the results for the US companies are displayed in Table 5 and for the non-US companies in Table 6. The researchers found there was a significant difference in the two groups. The largest variance was between the retail company in the US and the bank in Nicaragua. The test of the independent groups found the F score was significant. The overall variance for the US was .9345 and Non-US was 1.001305 The F score was  $1.001305/.9345=1.07$ , meaning there is a statistically significant difference between the US and non-US companies, allowing validation for the theory that culture or possible gender is the reason for the variances.

**TABLE 5**

**ANOVA: ONE-FACTOR TEST FOR US COMPANIES**

<b>ANOVA: Single Factor</b>						
<b>Three companies in the US</b>						
<b>SUMMARY</b>						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
<b>Hospital in the US</b>	5	19.34	3.868	0.19027		
<b>Retail in the US</b>	5	24.65	4.93	0.41755		
<b>Manufacturing in the US</b>	5	22.88	4.576	0.32668		
<b>Average Variance</b>				0.9345		
<b>ANOVA</b>						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
<b>Between Groups</b>	2.92404	2	1.46202	4.693483	0.031203	3.885294
<b>Within Groups</b>	3.738	12	0.3115			
<b>Total</b>	6.66204	14				

**TABLE 6**

**ANOVA: ONE-FACTOR TEST FOR NON-US COMPANIES**

**Anova: One Factor**

**SUMMARY**

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
<b>Bank in Nicaragua</b>	5	15.89	3.178	0.19167
<b>Bank in Guatemala</b>	5	16.35769	3.271538	0.144535
<b>Food Service in Nicaragua</b>	5	18.35	3.67	0.08925
<b>Small Businesses in Mexico</b>	5	18.82	3.764	0.01173
<b>Bank in Costa Rica</b>	5	18.68	3.736	0.17978
<b>Retail in Belize</b>	5	18.26632	3.653264	0.066924
<b>Retail in Honduras</b>	5	18.95966	3.791932	0.189791
<b>Retail in El Salvador</b>	5	17.15	3.43	.07885
<b>Retail in Ecuador</b>	5	17.9	3.58	.04795
				1.001305

**ANOVA**

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
<b>Between Groups</b>	1966446	8	0.245806	2.209367	0.049918	2.208518
<b>Within Groups</b>	4.005221	36	0.111256			
<b>Total</b>	5.971667	44				

## **SUGGESTIONS FOR FUTURE RESEARCH**

The present study could be replicated in other countries for comparative purposes. Cultural variables or gender may contribute to the variations in the MPS scores for United States companies and those in other countries. Of particular interest is the role that task significance may play in determining the overall MPS. It is suggested that additional research be conducted in other countries as a way to help companies redesign work in today's increasingly competitive, global environment. In addition, research could also be conducted in more professional job categories at both for-profit and not-for-profit organizations.

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