

# The Job Design Workplace Challenges In A Pandemic Era

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**Abstract**—A job shop design has been seen as an operational process in which the process design is crucial to the tasks'input and output. A process design plan affects the workplace concept selection to what most appropriate operational layout development in terms of labor cost and work schedule dimensions. Therefore, choosing the best job shop design concept based on situation analysis, such as COVID 19 and the available alternatives, adjusts the issue. The job shop design problem became an operational decision making problem to solve this problem.

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In this study, the process design matrix was examined within the linear programming (LP) modeling to research the best-suited mixed-integer linear programming model for a workplace in Pandemic Era.

The Job Design Workplace Challenges In A Pandemic Era According to "Reimagining the Office for the Pandemic Era," a Fortune's article in August/September (2020) on design workspaces. The reporter took a look at the workplace and how it has seen starting changes in the organization of the space to conduct workspace and the workstations. It also discussed how the current workspace's design structure might be inefficient and what the new workspace might look like based on the process design approach to adhere to the latest guidelines from the commercial estate design approach.

In another related business article (Goodbye, Open Office Hello," Dynamic Workplace)." The reporter stated that some businesses have considered the workplaces' reconfiguration to adhere to the safety reasons, which includes revised ventilation system and assuring the social distancing policy is maintained in operations. For instance, the dynamic workplace has been adopted by some tech companies that decided to pivot away from that traditional office layout that consisted variety of spaces, clustering desks, and seating arrangements to promote collaboration and socialization. However, since the pandemic, companies have worked on layout plans that allow workers to collaborate and socialize based on planned rotating in and out of the workplace based on a flexible schedule or staying home and visiting coopt workspaces near the living area.

With this in mind, the sociotechnical systems approach must be mentioned when explaining the office design's reimagining. It recognizes what the workplace interactions are when it comes to the technical. It then

focuses on human needs, ensuring an effective job design, which focuses on the worker's needs and the market for technical efficiency. Its goals are to design a joint optimization process that allows for the social and technological procedures to best the organization structure's functional desires without ignoring human needs by balancing what employers want and need within the technical requirements to complete the organizations' production system requirements.

However, another related study by Levesque, J., & Walker, H. F. (2007, 07) focused on the product and service quality control matrix. The study found that the manufacturing production process could increase production efficiencies by using seven new quality tools across various production platforms. The unique quality system would allow change from assembling one product to another at minimum cost control and product quality. For example, it would enable design participants to share design knowledge of the operation attributes, relation attributes, and physical attributes of the design processes to understand different design stages. (Wen- qiang, L., & Li, Y., 2018).

It also should be noted that the process selection of the design structures is best used for the production of the products, such as the work center (job shop), assembly line, and the continuous process. The service design process must also consider the various servicing approaches offered to users, such as the product-line, self-service, and personal- attention approach (Jacobs & Chase, 2011).

Kotler and Keller's study also discussed service design processes aligned with the production-line plan of various action steps required in the assembling procedure. It was treated as a manufacturing process rather than just the service provider self-service design approach. This service design approach helped describe how to shift the service burden to the user when conducting transactions. It was also useful in how a personal-attention process would rely only on the salesperson and customer's relationship (face-to-face). That interaction had ensured the product would be required by the end-user, who used service companies.

According to the study, the product design approach will also often focus on the features that will influence the functional and aesthetic factors. On the other hand, the service design will address the intangibles associated with interactions within the Performance of offering services, which may not be tied to its visible product lines. The study also found that the product design matrix could examine how new products speed up its drive-through delivery

method. It also described how trainers and time management systems were used to encourage workers to prepare and produce facilities. Next, it discussed what primary mechanism for the transfer of slow and codified production

know-how: central staff collect ideas for improving production methods (some of which may have come from production units), classifies the new knowledge, puts them in operations manuals, or embeds them in new equipment and systems, and teaches the production units how to use them are? (Ferdows, 2006).

This quality control matrix approach was correlated to the assembly line processes organized according to its step-by-step confirmations of end items for a particular user (Jacobs & Chase, 2011). However, this quality design structure was not feasible for a work center or job shop format that allowed the producer to gather similar group equipment for specific operational systems. It could not conduct a continuous process to the assembly line flow but focuses on integrating the productions rather than a discrete approach of separate functions within its operations.

The quality control matrix would allow various control quality factors to deliver the product within the required tolerance requirements. This study found that quality factors could also be used in the production process to produce high-quality items by using knowledgeable engineering and skill set to create a specific product or service (Jacobs & Chase, 2011).

Then, another study on design cost-effectiveness analysis, benefit-cost analysis, and systems analysis was useful to determine governmental cost measures on the program of activities Performance when it came to the meeting "Programming and Systems Analysis." The design criterion structures would be used to address the decision-making selection factors that are critical to achieving and developing the "Systems Analysis" model for operational management (Enthoven, A. (2019).

The last reviewed study focused on the cost-effectiveness of innovation of the serviced delivery with an emphasis on "Understanding and Anticipating Lag-Time Bias in Cost-Effectiveness Studies: The Role of Time in Cost-Effectiveness Analysis." The review also discussed the design process mechanisms that might influence the cost-effectiveness outcome to meet operational control requirements.

This research study will target the mentioned Process Design Matrix to determine operational design effectiveness. What kind of optimization process is needed to sustain it and help in the decision-making process by employing business analytical techniques, such as linear programming (LP) modeling? This analytical application model can also help determine the organization's operational efficiency within control management processes. Next, linear programming modeling applications will analyze the design process utilization. Lastly, the modeling process will also help to correlate to an optimal solution process. The decision-maker's perspective will also assist in predictive analytical solutions for functional problems in operations. For instance, the LP application will be applied

to cross-functional areas, such as manufacturing, operational maintenance, supply chain management, and finance, to determine how products and services were conducted in the operating processes. Thus, this paper will address how linear programming modeling applications. And the optimal maximization and minimization effects of the products and service design matrix processes.

## II. LITERATURE REVIEW

### Transformation process

The transformation process can be defined as a production system in manufacturing, whereby the set of input determines the output range of the produced products. This production

process could influence the transformation systems per production outputs based on process design uniqueness. The process design could also affect operations function within transformation activities completed in the required time limit. The transformation process could also add value to the production system based on the input factors associated with the structural alteration when coming to the physical change in the forming and assembling the production process, such as the job shop system.

### Job Shop System

In a job shop system, the production process would focus more on flexibility and quality and less efficiency. No two outputs would be the same unless a customer purchased the same custom board as another. The job shop transformation process would allow the producer to respond to customers' unique product design needs. However, the product customization process would require a highly skilled workforce within the design matrix to handle the challenges. Thus, product design customizations could come with some constraints and limitations in the production process.

However, the job shop system could consist of processed outputs based on the production demand to target segments' needs or wants. The product design matrix's customization and uniqueness could be tailored to the demand requirement within a job shop transformation system.

### Job Shop Transformation

In a job shop transformation system, the production process could also utilize the flow shop system with similar design factors to the continuous flow process. The difference is the discrete products or components demanded on outputs. Nevertheless, a flow shop system has a compatible system to job shop that allows for continuous flow of assembling within various process design stations so that each operation performs similar tasks. The process inputs may vary from production order to order, but these process design similarities would resemble the flow shop within a transformation system. The production functions performed at a design workstation could be characterized as similar to individual tasks performed by various operation functions. Thus, the flow shop system allows the process to design and transform the system to balance the production line. The balancing of the line was intended to determine the production cycle time needed per workstation to complete

specific tasks and improve the assembly line production processes' operational efficiency.

#### Assembly Line Production Processes

The assembly line production processes would be influenced by demand inputs of the product specification design that affects the product movement through workstations. Thus, the process design phase could affect production processes based on on-demand customization requirements. These process design characteristics were aligned to the job shop production process for small-batch and unit production.

Small-batch and Unit Production Small-batch and unit production rely significantly on human labor forces because they are not highly mechanized to produce significant output, such as job shop design. For example, Hermes International's Kelly handbag was handcrafted, stitched by hand and signed with the name of the late famous and actress Grace Kelly in it, which the bag was named after. However, the small-batch production process could be seen in the distribution center system, such as Amazon. The worker would pick the products from the shelves and assemble batched per order, which may also resemble a continuous process.

#### Continuous-Process Production

In a continuous-process production, the process design would often be mechanized. The product moves through the automation system within a mechanized and standardized process step above the assembly line. For instance, some of Amazon's distribution centers have robots that process customers' orders and bring them to the shipment workers. This process production also has similar high skill requirements, such as small-batch unit production, requiring a verbal communication approach to run the machinery (Daft, 2016). However, the continuous-process contrasts the service firms' methods with service processes and job design (Collier & Evans, 2017).

#### Service Process and Job Design

The service process and job design can be defined as developing activities that would provide a sequence of productive events to satisfy customers' requirements by developing operational procedures. These procedures would ensure that operations are correctly done the first time by using quick responsiveness and straightforward communication methods to reduce human error during the encounter (Collier & Evans, 2017). Therefore, the processes would require a high degree of service technology to deliver quality intangible output.

#### Service Technology

Service technology has production and consumption simultaneously process that does not exist until the customers have requested (i.e., clients meeting with an attorney and students and teachers are interacting within a classroom structure environment). That means the process of job design requires a labor and knowledge-intensive structure because of the direct interaction between the provider and the user. However, job design may have

difficulty measuring because the service providers and customers are often the co-producer, which causes uncertainties and challenges in meeting responsiveness to the quality of service requirements due to the intangibilities (Collier & Evans, 2017).

Since job shop designs are often configured on intangibility requirements to meet the internal and external customers' needs or wants, it isn't easy to measure operational efficacy based on prescriptive variables from most present literature reviews. This study ("Design and Provision of Information for Delivery Management in Make-to-Order Batch Manufacture")

- was reviewed (Nicholson, T. A. J. (1982) examined the flow

the pattern between multiproduct and multi-process batch manufacture production operational challenges within the process design structure.

#### Research Methodology Research Design

Since customer orders drive job shop designs to the provider that encourages interaction among internal and external populations to satisfy operational responsiveness requirements, it would probably make it easier to understand small-batch and unit production processes better. Therefore, it can be stated that customers' orders would not be delivered promptly unless the same customer ordered all products are completed. This process design would probably require that products were made as components that would belong to the outcome based on the same customers' orders, which must be processed simultaneously because of service technology requirements. Thus, products derived from customers' requests could be separated per batches, but components per product from the same customer's order would not be segregated. As a result, the researcher used a prescriptive method when evaluating a multiproduct batch environment. It allows the researcher to consider design decisions in the operational process design using mixed-integer linear programming model calculations (linear/nonlinear terms) better to understand the service process and job design setting.

Therefore, Murphy's traditional LP model approach was appropriately reviewed for this process design because it allows the batch calculation of essential batch factors such as segregation control. The Murphy approach also lets the researcher analyze cost control to achieve satisfactory commercial products based on the design application through customers' and providers' interactions with the production orders studied. However, as proposed to it when it comes to empirical formulas for the input data. Next, the mathematical modeling was reviewed to determine the long-run average cost functions associated with the proposed vendor-buyer integrated EPQ model with the optimal production-shipment requirement. This mathematical modeling approach was used to analyze providers' and customers' interactions that exchange transaction orders that are being studied in an overt observation

process for this research (Chiu, DarLin, Hwang, & Pan, 2011). As a seasonal demand model approach was also reviewed, focusing on the deterministic demand forecast based on the simultaneously optimal production schedule, inventory cycle, and completed finished goods. This research also examined the Design and Process Planning Integration (DPPI) model that focused on the manufacturing process information model applied over production capturing concurrent activities, alternative activities, and parallel activities. It will also focus on Manufacturing Activity that consists of workpiece handling, loading/unloading, and processing. The research study was then considered based on the mathematical modeling approach by Fattahi, 2007 study ("Mathematical modeling and heuristic approaches to flexible job shops scheduling problems") that focused on applying both a mathematical model and heuristic approaches in a job shop design process.

The reason to address the flexible job-shops scheduling problems (FJSP); it is the increase in computational requirements based on production constraints due to the process design. Thus, flexible job-shop scheduling problems (FJSP) study allow the researcher to a holistic view of decision-makers that simultaneously assess what different elements from the strategic and tactical points of view of the operations management are.

### III. DATA ANALYSIS PROCEDURES

However, a full description approach of the analytic data technique would describe the physical environment and historical aspect of the organization's operational process using data from sales and radio frequency data to capture the process design's efficiency. Doing so will provide a detailed description of the producers' interactions among customers from different production orders to help the researcher understand the data interchange systems with the distributing information. This direct computerized distribution reporting approach will include capturing multiple types of related data from the operation assembling. That consists of a systemic sampling of 129 from a list of companies surveyed through SurveyMonkey based on industrial data.

This data gathering method consists of a triangulation approach that considers respondent to open-ended and closed-ended questions on operational observations. Then, syndicated secondary data sources will be gathered for big data analytics to validate the "best practice" when analyzing the process design matrix based on production processes.

Thus, the study will use a survey approach that combines both hypotheses and research questions and other sampling techniques to examine the relationship between two or more variables within quantitative methods. The researcher can collect detailed descriptive data about respondents through the survey method. Thus, it provides the researcher with an additional opportunity to determine what is wrong or right within the job shop processes and what actions must be taken to rectify a process design problem.

Hypothesis Testing

This paper will examine the hypotheses if the job shop processes are efficiently performing on average based on the design process during the COVID -19 health crisis. The null and alternative hypotheses are:

**H<sub>0</sub>:**  $\mu \geq 5$

**H<sub>a</sub>:**  $\mu < 5$

The critical survey questions should then be addressed to participants of this study using some of the job shop design issues and options criterion.

The main survey research questions (closed-ended and opened ended) are as follows: 1: How quick was the check-in process at Job Shop Design? 2: How likely are you to use the Job Shop Process? 3: What was the essential feature of this product design that made you want to use it? 4: How would you rate the quality of the utilization process? 5: How likely are you to replace your continuous flow process compatible with the utilization system? Then, one opened end was said in 6: What do you dislike most about the continuous flow process? The last one was 7: How unique are the existing process design and resource utilization?

### Research Study Approach

For this study, the action-oriented research approach is appropriate because it addresses the effectiveness of the current job shop design concerns. Also, it's focusing on specific operational processes during a particular period. Thereby, it requires that respondents will be asked about operational processes throughout the surveying intervention. Thus, the survey addresses the nature of how the respondents' feelings about the operating service provider and why management must generate a solution to resolve this problem to determine the Breadth or Depth of the process design. The survey then collects respondents' experience and background to give feedback on the desired type of design process.

The researcher will use detailed documentation from the study. That explains the design process within a quality assurance program that can contribute to the operational processes. Then, a random sampling approach will be used; because it mostly involves open-ended and closed-ended questions to at least one hundred people that have similar background or experience on the design process being investigated.

The study will also use sampling techniques to examine the relationship between two or more variables, such as surveys (quantitative methods) that allowed the collection of detailed descriptive data. See the Appendix for Tables, Figures and Charts examples with data results

### Data and Method

The researcher collected data from Job Shop Design Survey that held a random sample population within a demographic format about the respondents' thoughts on current design processes. The variables were also constructed to focus on generalizing the ideas of processes. It also provided operational definitions that specified the activities or operations necessary to be measured in the methods. Then, the survey results were categorized into the closed-ended question datasets and opened ended datasets. The closed-ended datasets

consist of survey items that were number one through five and seven. These variables were defined in the descriptive statistics for the closed-ended questions, were analyzed in Frequency Distribution Quantitative and displayed in histograms with bars based on the answer choices and responses data that support the individual response. See statistical study results 1 through 5 and 7 in (Appendix A). Then, the opened ended question also, which was labeled as question six. It was classified as dependent and independent variables. Then, it was coded qualitative by using a pivottable. The open-ended question was also analyzed as Frequency Distribution – Quantitative. See in statistical study result 6 in (Appendix B). The data was then Normalized to reduce data redundancy and improve data integrity by structuring the relational databases following standard forms. These relational datasets were analyzed using the Megstat, and PHStat2 was reviewed later using the SPSS 26. Next, the survey data of demographics were collected as extensive covariates to help understand the respondents' stratified random sample makeup regarding age, gender, household income, region, and the device type used to take the survey. These data are shown in statistical study results 8 through 12 in (Appendix C).

#### Sample

The population size was 129 respondents for the survey on an organization's operational process. The final sample result was 129, and it had no exclusion of missing data. The respondent ages: 52 (40%) 18-29 age, 31 (24%) 30-44 age, 33 (26%) 45-60 age and 13 (10%) 60 and greater. The gender: 62 (49%) male and 67 (52%) female. The region: 4 (3%) New England, 18 (14%) Middle Atlantic, 9 (7%) East North Central, 7 (5%) West North Central, 34 (27%) South

Atlantic, 10 (8%) East South Central, 14 (11%) West South Central, 9 (7%) Mountain and 23 (18%) Pacific, and one region was recorded as skipped. The distribution of the significance in the sample is consistent with open-ended and close-ended questionnaires in the study. The sample showed a skewed towards the device type used to take the survey, in which 98% used a Tablet, and 2% used a Laptop during the survey procedure that dictated the measure.

#### Measures

The variables' measurement scale will involve Parametric Tests' variables of interest to be measured at an interval scale (Malhorta, 2019). It also allowed for the examination of the one-sample tests for proportions (Evan, 2016). For example, the quality ratios are expressed in the design process that had efficiently performed over time based on Question 4: How would you rate the utilization process's quality? The design process survey asked the respondent one question to rate the utilization process's quality by using a process scale. The scale was as followed:

- 1 – Very high quality
- 2 – high quality
- 3 – Neither high nor low quality
- 4 – Low quality
- 5 – Very low quality

The survey question measured the proportion of responses in the two hypotheses categories (H0) that were examined the average above 50%. If there also was no sufficient evidence to conclude that the current operational process had dropped below average.

Then, the Nonparametric Test was analyzed using the Kolmogorov-Smirnov (K-S) one-sample test. The K-S test was conducted on the independent variables' Mean by utilizing a one-sample (Malhorta, 2019). The model measured the null Hypothesis based on the value of the K to determine whether the confidence presented in the Hypothesis (H0), in which the continuous flow process of the average level of operational Performance that was mentioned; In Question 6: What do you dislike most about the continuous flow process? These measurements did provide the statistical data to accept or reject the Hypothesis with in the results and findings.

#### IV. RESULTS /FINDINGS

The Hypothesis test-related to differences was conducted using one-sample tests for proportions for the variable of interest, one of the least an interval scale and variables associated with nominal or ordinal scale. A one-sample chi-square test also analyzed the null Hypothesis based on the dependent variables' categories to determine the negligible probabilities and asymptotic significances based on a frequency distribution.

#### Frequency Distribution - Quantitative

The frequency distribution was used to obtain the number of responses associated with the variables' different values. These variables were produced in a table that contained the frequency counts based on percentages and cumulative ones of the values associated with the frequency data. The data were constructed into a histogram in Figure 1, in which the values of the show the Continuous Flow Process to the surveyed question on Sum of Respondents. The respondents' frequency value was recorded at 50, with a 45.8 percentage, which means valid responses indicated an understanding of the continuous flow process.

#### One-Sample t-Test for Means

The quality of the utilization process' t-Test for the Hypothesis of the Means showed that the Standard Error of the Mean

0.10 and Sample Mean 0.7 from a hypothesized value (5), but the t-Test Statistic result was found at -41.8 by comparing it to the Lower Critical Value  $t_{\alpha/2}$  is, -41.8 (0.68), which fell as rejection region. Therefore, the Null Hypothesis was rejected. A p-Value of 1.52 showed less than a 2% chance that the test statistics would be -41.8 or more significant if the null Hypothesis were correct. A two-tailed test was used to determine the level of significance. Thus, negative (-0.674) and positive (0.674) critical values were observed because the t-

Test Statistics do not fall between them; then, the Null

The Hypothesis was rejected. See Figure 2. ANOVA: Single Factor

An ANOVA: Single Factor was conducted to compute the variance between the respondents' open-ended questionnaires to determine the ratio of the groups' difference. These actions are measured to determine the mean square (MS) between-group to examine the significant differences between the smaller and larger variance. The variance ratio was observed based on the MS

Between Groups/MS Within Groups, which provided a test statistic similar to the quality of variation in an F-distribution. The F-statistic allowed the examination of the significance level to determine if it exceeded the critical value, which rejects the null Hypothesis. In this analysis,  $F = 107716.9/65205.81 = 1.65$ , and the significant amount (F crit) from the F-distribution was recorded as 3.115366. See Figure 3 in the Appendix. Therefore, the result showed that  $F > F_{crit}$ , which means must reject the null Hypothesis and concluded that there are significant differences within the means satisfaction among the dependent variables—however, the data analysis was determined to find whether two categorical variables are independent by using the chi-square test for independent with nonparametric tests.

#### Nonparametric Tests

The chi-square test was used to perform on the independent variable to serve as a goodness-of-fit test to determine whether significant differences exist between each category's observed cases within the expected number. The procedure uses the observed and expected (hypothesized) frequencies to compute the chi-square statistics to determine the sum of the square of differences between the observed and expected frequency. These frequencies are compared for a specific level of significance to the critical value within freedom degrees. If the test statistic exceeded the critical value for the specified level of significance, reject the  $H_0$ . In this case, the One-Sample Chi-Square Test was tested with a significance level of .050. The categorical variables Performance Well and Performance Somewhat Well had recorded a significance of 1.000. See Table 1 in the Appendix.

In contrast, the Performance Not well had recorded as .980. Thus, the test statistic Decision was made to Retain the null Hypothesis because the three categorical variables are not independent of each other. The retain the null Hypothesis substantiated by the frequency value point of 62.5, or 63 percent of the respondents believe the job design process has Performance Well. See figure 4 in the Appendix.

#### V. DISCUSSION

The respondents were aware of the job shop design process before the survey study was by the researcher to capture decision-makers' strategic and tactical views on operations management, which supported the prior research by Moreno and Montagna (2008). In this study, the respondents (53.49%) stated that they were also quick to the check-in process, and (42.64%) of them were likely to use it. When it came to the essential feature of this product design, (31.7%) stated that it was the reasoning for using it. However, the job shop design processing of the rate quality of the respondents' utilization process differences. For instance, some of them (46.51%) felt that high quality was significant, whereas (37.98%) stated neither high nor low quality as a determinate.

For these respondents, the design process had a strong effect on the workflow progress to produce quality products. One of the highly significant possibilities was associated with this product design's essential feature that made the respondents want to use it, which was recorded at (31.78%) for the Design and (23.26%) Utilization. Thus,

the respondents had high confidence in the production outcomes based on the design workflow process. The respondents were (48.84%) more likely to replace the continuous flow process compatible with the utilization system because they (50.39%) felt the uniqueness of the existing process design and resource utilization was a significant determinant factor.

The results suggested that the job design process had a significant impact on these respondents' operation process. Although the design process was the reason to focus on the design workflow process's uniqueness, they were also influenced by the operation's continuous flow process. The results indicate that respondents were more likely to focus on the process quality, either from the utilization process or system. Thus, the results suggest that focusing on the design workflow process can address the process design and resource utilization.

Although the study results do not generalize the job shop design process across industry standards, it can indicate the production outcomes on operational wellness based on performance measures within a utilization system. Further replication of this study by small business administration researchers could provide validation of the results. By the same means, it would be important for future studies to examine how workers' workflow process of learning and training to this pertains to continuous improvement process can help assess the job shop design.

#### VI. CONCLUSION

In conclusion, the design process study has shown that operational processes and utilization systems found that respondents' workflow may strongly affect the continuous improvement process. The study also explained how groups of design workflow process understanding perceived the most important benefits of the production outcomes and assessment as the perceived importance of quality products' utilization process and output. Interestingly, it also addressed the common uniqueness of the existing process design, and resource utilization ranked higher than the average importance of replacing the continuous flow process. Lastly, this study discussed the mixed-integer linear programming model calculations (linear/nonlinear terms) better to understand the service process and job design setting.

#### Future Research Recommendation

Future research should be conducted on the perceived importance of the uniqueness of the existing process design and continuous flow process compatibility with the job shop process based on "The New Normal Gets Down to Business," according to The Wall Street Journal (June 23, 2020). The research would also seek ways to examine how businesses might be coalescing around employee choice by giving them a say over how they continue to operate under the COVID -19 virus environmental conditions and what are potential changes to the job shop design process to help to reduce the virus risk in the continuous flow process.

#### APPENDIX

Figure 2

Figure3

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TABLE I

t-Test for Hypothesis of the Mean	
<b>Data</b>	
Null Hypothesis $m=$	5
Level of Significance	0.5
Sample Size	129
Sample Mean	0.775193798
Sample Standard Deviation	1.14652709
Intermediate Calculations	
Standard Error of the Mean	0.100946082
Degrees of Freedom	128
t-Test Statistic	-41.85210696
<b>Two-Tail Test</b>	
Lower Critical Value	-0.676411278
Upper Critical Value	0.676411278
p-Value	1.52695E-76
<b>Reject the null Hypothesis</b>	

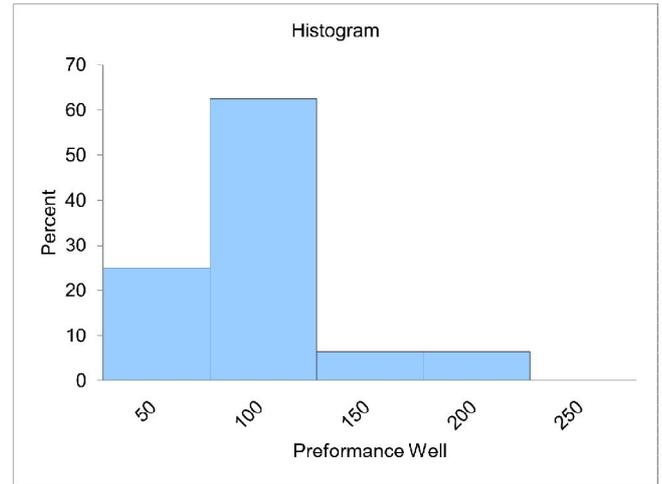


Chart 2.

TABLE II

ANOVA: Single Factor

SUMMARY				
Groups	Count	Sum	Average	Variance
127	15	1800	120	1155.429
127	44	4232	96.18182	4232.292
127	21	4587	218.4286	241134.2

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	215433.8	2	107716.9	1.651952	0.198395	3.115366
Within Groups	5020848	77	65205.81			
Total	5236281	79				

TABLE III

Hypothesis Test Summary				
Null Hypothesis	Test	Sig.	Decision	
1 The categories of V0-Respondent I Do occur with equal probabilities.	One-Sample Chi-Square Test	1.000	Retain the null Hypothesis.	
2 The categories of V1-Performance Well occur with equal probabilities.	One-Sample Chi-Square Test	1.000	Retain the null Hypothesis.	
3 The categories of V2-Performance do not well occur with equal probabilities.	One-Sample Chi-Square Test	.980	Retain the null Hypothesis.	
4 The categories of V3-Performance Somewhat Well occur with equal probabilities.	One-Sample Chi-Square Test	1.000	Retain the null Hypothesis.	

Asymptotic significance is displayed. The significance level is .050. Table 1

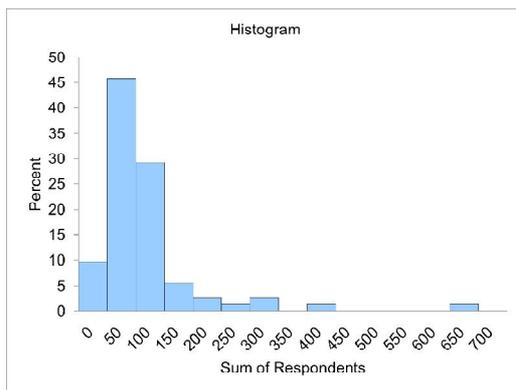


Chart 1.



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