# PROFESSIONAL THESIS SAMPLE

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# QUALITY CONTROL IN THE MANUFACTURING PROCESS

We live in a time where many skills and abilities are attained. It is interesting to observe the world that in the daily race for new achievements creates new business approaches and their realization. New technologies, new manufacturers and suppliers, increasing customer and customer requirements, new requirements and constraints on targeted markets, new approaches and business skills bring good business results and create a new style of enterprise management where management needs to find quick responses and solutions. Stylish development and strengthening of competition have increased the importance of quality control in the production and use of products as well as business operations. Regardless of all innovations and modernization, one fact remains the same. Ever since the very beginnings of the development of human civilization, that is, everything that is created and produced must have its affirmation found on the market. Therefore, it is necessary for the ideas, products or services to find the consumer or the customer. The effects of sampling in quality control and quality improvement alone result in increased sales of products, creating tradition in product quality and achieving greater profit, enabling them to enter the company's best. It also creates the possibility of cooperating with other companies in conditions where special evidence is not needed, profits are gained in the area of their own image, advertising as well as increased competitiveness. The process is a set of logically related activities that are attempting to execute the company's goal, which is the conversion of inputs to outputs. The result of the process itself is output, the final product for the customer or end user. Each process has its beginning and end, and inter-party activities can always be improved. Indeed, the process requires continuous improvement, and in order for the promotion activities to be carried out successfully, it is necessary to spot the shortcomings. That is why the process is necessary to analyze, because the analysis itself determines the direction of the company's goals. It can be recognized by the changes that occur when performing certain activities and actions. The process, with people and technology, is one of the three important gatherings that keep the organization together. All three sets are connected and can easily break down. Control during production has been the main activity of technical control in companies for a long time, and in many, this state of affairs has not changed so far. Control in the production process is a very important activity, but only as part of the process of the general quality assurance system. In production plants quality is defined as the degree of compatibility with the requirements given in the technical documentation or a general standard. Let's say here that full duplication in production does not have to mean quality in use, if the claim is misplaced with regard to the purpose of the product or customer's wish. More recently, the term concept of quality adds the concept of product reliability as a complement to the overall product value, and it is likely that the product or device will function properly under certain conditions for a given time.

Reliability is embedded in a specific part or device with the correct choice of material, construction and production in relation to the environment and loads that are in use. High reliability is especially required for devices whose error is very expensive or fatal for its function, or otherwise inaccessible for repair and maintenance. Ultimately, the user of the product is not interested in matching product specifications and cost optimization with the manufacturer. The basic requirement of a user of a product is to satisfy the product in use. It requires optimization of costs in use, which not only includes the purchase price of the product, but also maintenance costs, loss-making costs, spare parts costs, parts-storage costs, and so on. In shoe manufacturing, they are very important aesthetic characteristics because they often serve the customer as a benchmark for assessing the skill and ability of the manufacturer to realize and other functional characteristics of the product. Since it is very costly, impractical and in most cases unnecessary to examine all population units, then a sample is used in analysis and research. The sample is representative of the statistical mass to be investigated. Therefore, the sample method is also called a representative method. It can be said freely that the sample is the number of elements taken from the statistical mass that is being investigated and that the statistical mass (population) is investigated. A representative sample is not always easy to choose because the populations we are researching are often very little known or completely unknown to us. If all elements of the basic set were equal, it would be enough to take one element in the sample and give it the characteristics of the basic set. In practice, that is not the case. For sampling it can be said that the evaluation of a basic set is based on one or more samples. Thus, in the quality control based on samples received goods from the supplier, the process is controlled and the product that is their result is controlled. When using the sampling method, the general principles of sampling should be respected, namely: Accidentally - it is a question of how the selection of sample elements ensures their objective selection and eliminates (or minimizes) the possibility of selecting elements that in some way particularly point out or are simply plausible within the basic set. This principle is achieved by using or generating random number tables.

Independence - in the case of repeated repetition of several samples from a particular set of bases, the sample selection methodology should provide a selection of elements in a new sample which does not in any way depend on the previous selection. When sampling infinite sets, this principle is realized automatically. When sampling final sets, the principle will be achieved by returning the excluded units to the basic set. Inertia - selecting elements in the sample must provide such a selection of elements that can reasonably assess the basic set. Representatively - the sample must be repetitive and must include all possible groups of elements of the basic set to the extent that they participate in it, i.e. make that set. The procedure for selecting elements in a sample is based on: determining the population, choosing an appropriate selection box, defining the sample selection plan, and sample size. There are two types of patterns that are further divided into several subtypes: Random: Simple random, systemic, -strategic and -group groups. Intent: - occasional, - a pattern of acquaintances and - quotients. Conducting objective numerical statements about the precision of a sample result is only possible when the samples are random (based on the probability theory) because then for each unit of population there is a probability of entering the sample.

One of the basic advantages of working with random samples is that researchers do not have to know the characteristics of the basic set of samples they are taking, as well as their distribution. A simple random sample is the simplest model of a random sample. In it, each element of the population has the same likelihood of choice in the sample. This is achieved by random selection so that each unit has the same probability that it will enter the sample. Each element in the basic set has the probability of 1 / N. The number of units in the population (N) is smaller, this is the likelihood of each element to enter the sample larger, and vice versa. But this also depends on the number of elements (n) that are taken in the sample. To use a random sample, a list of all population units is required. Elements in the sample are selected in several ways. One of the simplest ways of random sampling is that all elements of the population are labeled from 1 to N and placed in a closed box. By removing n elements from the set without viewing, and with the mixing of numbers, the coincidence request is completely guaranteed. By using a random number table or a random number generator, a random sample selection is also provided. A systematic pattern is suitable if many elements of the population are chosen in the sample. It is chosen in this way to take the second element from the population, with the first element chosen randomly. The choice or selection interval (k), which is the basis for the selection of elements in a systematic pattern, is determined by the ratio of population size (N) and desired sample size (n). It is important to emphasize that a systemic choice will give a random sample, only if the units in the population are randomly sorted. A systematic pattern is often applied due to simplicity.

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