

Enhancing product development in bag industry by using SPC analysis: A case study done in Kenan Canta Bag Company

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Abstract- The focus of this study is the implementation of the SPC analysis in a bag production company during new product development. In this study the subject of analysis is the Kenan Canta Company from Turkey. In 2015 the Company decides to develop a messenger bag as its own new product. For this purpose it decided to implement the SPC analysis which is used in the new product development. By conducting SPC analysis, there is a better view of the difficulties that the bag production company faces during the transition from file bag to messenger bag production and solutions can be derived in order to solve these problems. In this paper the SPC analysis implementation process in the Company is explained. Consequently the results and the benefits that SPC analysis process had on the Kenan Canta Company are discussed.

Index Terms— SPC analysis, File bags, Messenger bags, Production process, Promotional bags, Raw materials, Scrap

1 INTRODUCTION

In today's crowded business market, companies – whether big or small- are competing more than ever to deliver their message.(1) In any business managers are always looking for new ways to improve the efficiency of the campaigns planned within a company's marketing strategy. Whether in the past advertising has always been considered the most effective marketing tool to increase the success of a brand, in recent years an important phenomenon has occurred. Advertising indeed has lost its leading role due to a significant switching toward sales promotions. (6)

Also known as promotional merchandise, promotional products are products that companies give away to promote their corporate identity, logo, an upcoming event, their brand or a specific product. (1) Since the beginning of their use, a plenty of different typologies has been developed and nowadays it becomes more and more challenging for marketers to choose among them, the more effective, according to a particular context or the particular target they want to reach. Custom branded messenger bags are some of the most successful promotional products because they are practical, useful, and built to last. Recipients of promotional messenger bags don't just keep the bag, but continue to use it in their everyday life, spreading your brand name around the world. In fact, according to ASI (Advertising Specialty Institute) in their 2016 Impressions Study, a single bag can generate as many as 5,800

impressions in its lifetime.(2)

Promotional bags are produced by the companies in order to suit their tastes and usage needs. People change their need and their perception of stimuli according to the context that surround them, and it comes directly from here the necessity of avoiding out - of - use products and adapting new strategies for choosing the right promotional item in order to meet the clients demands. (2) Now a days, tablets represent main way of representing the new products and services of companies to its customers. As a result of the latest technological achievements and increased use of tablets, the bag production companies are forced to be in accordance with this trend - thus to produce promotional bags that will have great usage by the consumers. This has led to a shift from previous file bags to a newer form of production, messenger bags. However the increasing cost of marketing a new product or service makes it critical for a company to come up with an efficient strategy to promote its business. In some cases the bag production company satisfies the needs of the costumers with few changes in products that are in the process of production or are finished. However in other cases, the product has to undertake the process from scratch in order to satisfy the needs of the company that requests the promotional bag which results in inevitable expenses for the bag production company. In this paper the Statistical Process Control-SPC analysis is used as a tool for more efficient transition from file bag to promotional bag production in the Kenan Canta bag company. The SPC analysis is made by quantifying each produced bag from the very first beginning of the production of the promotional bag which is 15.02.2016 up to 24.03.2016. Detailed information regarding the conducted SPC analysis is being provided in the next part Materials and Methodology. By conducting SPC analysis there

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is a better view on the difficulties that the bag production company faces during the transition from file bag to messenger bag production and the company can come to solutions how to solve these problems.

2 MATERIALS AND METHODOLOGY

As practical implementation of our research study, we select "Kenan Canta Bag Company" for real life implementation. Kenan Canta Company is a bag production company that produces bags known under the brand name "Kingstone" and exports its products in 11 countries. The brand Kingstone encompasses many categories of products like backpack bags, laptop bags, file bags, messenger bags and varieties types of bag products. The company also produces promotional bags for different companies and institutions such as, the Government of R.Turkey-Tika, Ankara University, Ted Collages, Pavillion Hotels etc. The company continuously develops its production process and techniques in order to satisfy the clients. In 2015 year the company decides to develop new product-the messenger bag in order to increase its range of products and be more competitive in the market. For this research work there is conducted SPC analysis in order to enhance the transition from file bag production to messenger bag production of the Kenan Canta Company.

There is evidenced shift from hardcopy catalogues to digital catalogues. The companies now a days prefer to deliver their products/services in digital catalogues through e-mail or other digital technological means instead in hardcopy. Furthermore companies believe that using digital means is a more practical way of promoting their products/services as well as the information are easily assessed and can be kept for longer period. Due to this trend today's companies instead to order file bags used for delivering the most recent catalogues, they prefer to order messenger bags used to carry tablets for promotional purposes. Also the Kenan Canta Company in order to follow this trend decides to shift from file bag to messenger bag. The companies prefer messenger bags to carry following features: good desing which will add value to the company, being comfortably used by commercial employers, multifunctional that can be used for carrying personal equipment and safe that can protect the equipment inside from water, scratches etc.

For the purpose of SPC analysis implementation a team of workers was formed in the Kenan Canta Company. In order to quantify the produced bags the team made a list of quality requirements and appropriate notes to each requirement. The team appraised every produced bag in the period of 15.02.2016 to 24.03.2016. The period of appraisal encompasses six weeks. According to the SPC team in Kenan Canta this time period is enough in order the analyse the new production process in detail in order to prevent upcoming difficulties in production and to have efficient and cost-effective process. At the end of the appraisal proces every produced bag had a quality note and this note is compared with the specified quality note which is accepted as an appropriate one. At the end of the SPC analysis is obtained the number of the scrap bags that do not satisfy the specified quality note and also is obtained the number of bags that satisfy the specified quality note. As a

result the percentage of scrap is obtained and how this percentage varies within a period between 15.02.2016 to 24.03.2016.

The special team for implementation of the SPC analysis for better implementation of the SPC analysis divided the messenger bag into 5 main parts as follows,

- Belt/Strap
- Clips
- Zipper
- Main body and exterior pockets and
- Interior pockets

After the team divided the messenger bag into main parts it assigned quality requirements and notes for each part. The notes for each part vary from 1 to 3 depending on the quality of production with 1 being the highest grade and 3 being the lowest grade. Below are presented the quality requirements and notes for each part.

1. Quality requirements and notes for the belt/strap

For the SPC implementation team having belt with 1 grade means all parts to be well sewed, the material is without scratches, holes and it is not torn in any part and the prescribed dimensions are achieved. A belt/strap with grade 3-the lowest grade is accepted belt with dimensions deviating from the original prescribed dimensions for more than 10 mm, there are unsowed parts with total length of 1 cm, there is at least one kind of scratches, holes and torn parts. Below are given the requirements and notes for the belt from 1 to 3.

- 1- Dimensions do not deviate from the original prescribed dimensions, all parts are well sown and there is no any kind of scratch, hole or torn part;
- 2- Dimensions deviate from the original prescribed dimensions up to 10 mm, there are unsowed parts with total length up to 10 mm and there is no any kind of scratch, hole or torn part;
- 3- Dimensions deviate from the prescribed dimensions for more than 10 mm, there are unsowed parts with total length more than 10 mm or there is at least one scratch, hole or torn part;

For example, a produced belt with no any kind of scratch, hole or torn part but with dimensions deviating for 7mm/0.7cm and the total length of unsowed parts is below 5mm/0.5 cm is being graded with note 2. However, the same belt with dimensions deviating for more than 10 mm is being graded as note 3.

2. Quality requirements and notes for the clip

For the SPC implementation team the clip is being grade only with notes 1 and 3. A clip with 1 grade means all parts are

without scratches, holes and they are not broken, otherwise the clip is graded with note 3.

3. Quality requirements and notes for the zipper

For the SPC implementation team having zipper with 1 grade means all parts to be well sewed, the material is without scratches, holes and it is not torn in any part. A zipper with grade 3-the lowest grade is accepted belt with unsowed parts with total length more than 1 cm and with at least one kind of scratch, hole and torn part. Below are given the requirements and notes for the zipper from 1 to 3.

- 1- All parts are well sown and there is no any kind of scratch, hole or torn part;
- 2- There are unsowed parts with total length up to 10 mm and there is no any kind of scratch, hole or torn part;
- 3- There are unsowed parts with total length more than 10 mm and above or there is at least one scratch, hole or torn part;

For example, a produced zipper with no any kind of scratch, hole or torn part but with a total length of unsowed parts below 5mm/0.5 cm is being graded with note 2. However, the same zipper with unsowed parts having total length more than 10 mm is being graded as note 3.

4. Quality requirements and notes for the main body and exterior pockets

According to the decision of the SPC team the main body and the exterior pockets are being assessed as one part. For the team having all parts well sown, without scratches, holes and torn parts as well as having accomplished the original dimensions leads to the best grade-1. All other deviances from the before mentioned decrease the note of the work done. Below are given the requirements and notes for the main body including the exterior pockets from 1 to 3.

- 1- All parts are well sown, there is no deviation from the specified dimensions and there is no any kind of scratch, hole or torn part;
- 2- There are unsowed parts with total length up to 10 mm and the deviation from the specified dimensions does not exceed 10 mm. Also there is no any kind of scratch, hole or torn part;
- 3- Dimensions deviate from the prescribed dimensions for more than 10 mm, there are unsowed parts with total length more than 10 mm or there is at least one scratch, hole or torn part;

For example, a produced main body with no any kind of

scratch, hole or torn part but with a total length of unsowed parts above 10 mm is being graded with note 3. However, the same part with unsowed parts having total length 7 mm is being graded as note 2.

5. Quality requirements and notes for the interior pockets

For the final part of the bag the interior pockets the SPC implementation team had taken the following decisions regarding the notes and the requirements,

- 1- All parts are well sown, there is no deviation from the specified dimensions and there is no any kind of scratch, hole or torn part;
- 2- There are unsowed parts with total length up to 10 mm and the deviation from the specified dimensions does not exceed 10 mm. Also there is no any kind of scratch, hole or torn part;
- 3- Dimensions deviate from the prescribed dimensions for more than 10 mm, there are unsowed parts with total length more than 10 mm or there is at least one scratch, hole or torn part;

For example, an interior pocket with no any kind of scratch, hole or torn part but with a total length of unsowed parts of 15 mm is being graded with note 3. However, the same interior pocket with unsowed parts having total length of 5 mm is being graded as note 2.

For any part mentioned above if there is scratch or torn parts the whole produced bag automatically is accepted as a scrap since it cannot be sold like that.

For example, if there is a bag with an interior pocket where all parts are well sown and there is no deviation from the specified dimensions but there is one scratch, this bag is automatically graded as a scrap.

In the Table.1 below is provided the data regarding the graded parts and the final note of the bag for 15.02.2016.

For the best sale purposes the team decided to accept the lowest grade of 1.5 as the maximum accepted grade to tolerate. The best grade accepted is the grade 1. All the bags with final note above 1.5 are being accepted to be scrap for the purpose of the SPC analysis.

No. bag	Belt	Clip	Zipper	Main body & exterior pockets	Interior pockets	Quality note
1	3	3	2	2	2	3
2	2	1	1	2	2	1.6
3	1	1	2	1	2	1.4
4	3	1	2	2	1	1.8
5	1	1	1	2	1	1.2
6	1	1	2	2	3	1.8
7	1	1	1	1	1	1
8	2	1	2	1	1	1.4
9	1	1	1	2	2	1.4
10	2	1	2	1	2	1.6
11	1	1	2	2	1	1.4
12	1	1	1	3	3	1.8
13	1	3	1	1	1	3
14	1	1	3	1	1	1.4
15	1	1	1	1	1	1
16	1	1	1	1	1	1
17	1	1	1	2	1	1.2
18	1	1	1	1	1	1
19	1	1	1	1	1	1
20	1	1	1	1	1	1

Table 1. Quality notes of each bag part and of the bag overall for each produced bag on 15.02.2016

The Chart 1. Below clearly depicts how the grade of the bags varied on 15.02.2016.

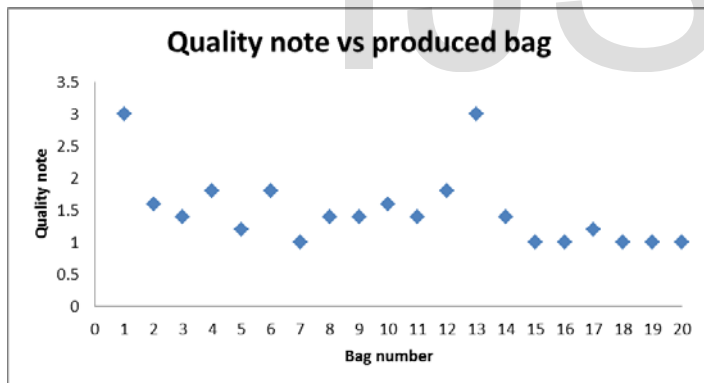


Chart 1. Distribution of the note of the produced bags on 15.02.2016

RESULTS AND DISCUSSIONS

By using of the SPC analysis the company can view the quality of the bags being produced from other angle. In this case of the Kenan Canta company were analyzed the bags being produced in the testing period from 15.02.2016 up to 25.03.2016. In the testing period were involved 10 employees. Each day only two employees produced the new bags and the other employees were engaged in the other regular activities of the company in order not to stop the production of the other products. Every day different pair of employees was involved in the production of the bags. Every day was produced 20

bags.

As can be seen in the Chart 2. below, the percentage of scarp bags in the first days of the testing period is higher than the scarp percentage in the upcoming days. As the days passes and reaches the end of the testing period the scarp percentage becomes lower.

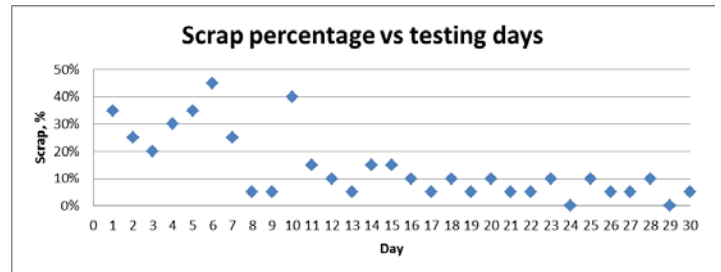


Chart 2. Scrap percentage per testing day

Below is given Chart 3. which depicts the percentage scarp variation every week.

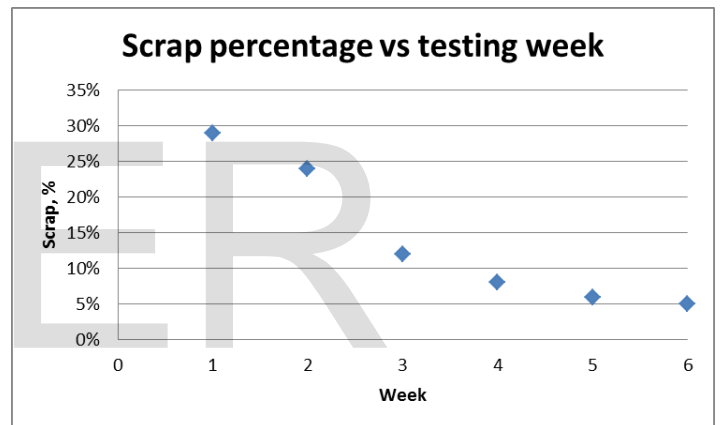


Chart 3. Scrap percentage per week

By using the SPC analysis the Kenan Canta Company could analyze the reasons for high scarp percentage in the first days of the testing period. By using the reasons it could take the required steps in orders to fix the problems and to decrease the scarp and to increase the quality of the produced bags. In this case of Kenan Canta Company as the main reasons for the high scarp percentage in the first days were pointed the habits of the employees and the tiredness.

Since the messenger bag is the new product in the Kenan Canta Company the employees are not accustomed to it. The employees needed time to get accustomed to the new shapes, sewing techniques and material. As the time passed this challenges were overcome by the employees and the scarp was reduced.

Also, the company changed the production hours of the messenger bags in order to increase the efficiency. In the first days of the testing period the involved employees produced the bags after they finished their regular activities in the company. But in the following weeks of the testing period the company changed this habit and the involved employees firstly produced the messenger bags for testing and after were

involved in the regular activities in the company. This was shown as critical for reduction of the scrap percentage in the later days of the testing period.

4 CONCLUSION

Most of the companies, including the bag industry, face with the inevitable need to continuously change their product features/design and production line which represents a challenge for the companies. Transformation of the product design with less expenses and low risk is a huge success for the company. In order to look deeply in to the process of the transformation of the product design and its development in Kenan Canta Bag Company SPC analysis was used as a tool. By using the SPC analysis the Kenan Canta Company could detect the reasons for the scrap bags and take the required steps to minimize it. As a result the company could easily transit from file bag into messenger bag. With the production of the messenger bag the company expands its product range and satisfies the clients' needs for functionality and price.

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