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Marketing Strategies of Leading Cotton Seed Companies in Telangana State

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Authors' contributions

This work was carried out in collaboration among all authors. Author SJ designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors NS and PR managed the analyses of the study. Author KS managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Marketing strategy is a long-term business plan of any organization with the fundamental goal of achieving a sustainable competitive advantage by understanding the needs of customers. This study also evaluates the perception of dealers towards the market mix elements comprising product, price, promotion and place of the products and services of competing brands. The study is conducted in southern part of Telangana State constituting Jogulamba Gadwal, Mahabubnagar and Rangareddy districts. The data is collected through random sampling method covering dealers and number of farmers. Statistical tests like ANOVA, and tools like multidimensional scale were used in this study. The study revealed that most of the dealers are well educated, middle aged people with age group ranging between 30-40 years with the income of more than 7 lakhs per annum. The dealers data after the application of statistical tools revealed that strategies applied by Kaveri, Rasi and

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Nuziveedu are similar whereas the strategies applied by Tata Rallis and other brands like Ajith, Nidhi seeds are different from one another when the product, price, promotion and place elements are considered.

Keywords: Marketing strategy; customer perception; marketing mix; seed.

1. INTRODUCTION

A seed is a basic unit for the production which acts as the foundation for the progress of the food chain and plays an important role in the sustainability of the agro-food system. The seed industry in India has shown a substantial change from past few centuries with farmers relying on purchasing seed from markets with better traits than relying from seeds of previous season's harvest. With the advent of green revolution (1964-1966), the whole seed market scenario has changed. Increased demand of assured quality and certified seeds by the farmers has led to the development of private seed companies (national and international) with good genetic traits that improve the yield through research and development.

The global seed market has its existence in the countries of North America, Europe, China and India. North America along with Europe contribute its highest market share of 55 per cent followed by china which is 16 per cent. However, India has a significant share of 4 percent [1]. Indian seed sector has increased its size and performance over last four decades. The success is achieved through the introduction of high yielding varieties of wheat, rice & hybrid release of maize, cotton & millets with the support of public organizations like National Seed Corporation (NSC), State Farms Corporation of India (SFCI) and State Seed Corporation (SSC). The seed sector gradually enhanced with the development of private companies which deals with the field & vegetable crops.

1.1 Private and Public Seed Sector

The private sector has been playing a significant role in the Indian seed Industry. At present, the number of companies engaged in seed production or seed trade is of the order of 400 or 500 [2]. However, the main focus of private seed sector is on high value low volume seeds like cotton, chilly, sunflower, etc. But the Low value and High volume seeds which majorly include cereals like rice, sorghum, wheat etc. are still in the hands of Public seed sector.

Persistent efforts by Indian breeders in both public and private sectors yielded 7148 varieties that were noted under Indian seed act 1966 during 1966-2018 which are distributed through 147424 dealers [2]. In India, of the total seed demand 30 per cent is met by commercial seed market and remaining through farmer own seed, which are saved from previous crop. Public sector shares 40 per cent of commercial seed market and a whopping 60 per cent comes from private seed market which comprises of both organized and unorganized sector.

1.2 Cotton Seed Market

India is the first country to commercialize cotton hybrid seed variety H-4 released by Gujarat Agricultural University in 1970. Public sector research program in developing hybrids of different crops was wide during the early 1970's.

The first cotton seed hybrid by the private sector was MECH 11 by Mahyco in 1979. But the hybrid released by other seed companies was started in 1990's. The private sector in the cotton sector was successfully emerged in the states of Gujarat, Maharashtra and Andhra Pradesh in the early years of 1990's.

1.3 Bt Cotton

Bacillus thuringiensis is the soil borne bacterium that is toxic to pests and safer to higher animals. Cry genes from the bacteria act against the pests and they have been extracted from the bacteria, transferred through genetic engineering techniques into the plants of cotton. In India, approvals to Bt cotton was given to the three hybrids released by the Mahyco-Monsanto joint venture. The Government of India through GEAC, Ministry of environment has permitted release of Bt cotton varieties for commercial production since 2002.

The steep rise in cotton export earning explains the scenario of cotton production after the release of Bt hybrids cotton varieties. The farmer's interest turned towards the high yielding Bt cotton varieties with reduced costs of pesticides and higher returns on yield.

The private seed sector took the clutch of this opportunity and entered the hybrid seed industry with huge investments in partnership with the foreign seed companies. Several domestic companies have also launched hybrid GM cotton seeds by licensing the gene from developers and then developing their own hybrids. The hybrid seed market in India is largely in the hands of Nuziveedu, Mahyco, Kaveri, Monsanto, Rasi seeds, Bayer India, Pioneer seeds and Syngenta contributing major share in the hybrid seed sector.

Since India has well established plant breeding programs and substantial commercial seed activities, it would be worthwhile to assess the market for seed produced through private organizations. There is a need to review the various strategies applied by different companies to approach farmers and to improve their sales through promotional strategies. Though there are many existing local seed companies, the reasons why farmers are opting for a few brands that have maximum market share in the seed industry are to be examined. The factors influencing the farmers to buy a particular brand vary across crops and regions. To understand these aspects, cotton crop would be chosen for carrying out the study as almost all seed companies have prominent market for BT cotton seed.

In order to become pioneer in any industry requires a strategy that influences their ability to improve the sales and to develop a competitive advantage over other players in the same market. To locate the relative positions of key players in the seed industry, a Multidimensional scale map is constructed taking the product, place, price and promotion attributes

2. METHODOLOGY

The study is conducted in southern Telangana regions in the districts of Gadwal, Mahabub Nagar and Nagar Kurnool. These districts were purposively selected owing to their large area under cotton cultivation. The area of cotton sown in the year 2018 in the districts of Mahabub Nagar, Nagar Kurnool and Gadwal districts are 11809, 84205, 16362 hectares respectively [3]. The data is collected from 6 dealers in each district which constitutes 18 dealers as a whole.

The statistical test, namely, Analysis of variance (ANOVA) was used in this study to test is a collection of statistical models and their associated estimation procedures such as variation among and between the groups used to analyze the differences among group means in a sample. In this study ANOVA is used to compare the market mix elements between cotton seed companies as per the data collected from the dealers [4,5,6].

Multidimensional is a means of visualizing the level of similarity of individual cases of a dataset. MDS has been used in marketing to identify the number and nature of dimensions consumers use to perceive different brands in the market place, the positioning of current brands on these dimensions and the positioning of consumers ideal brand on these dimensions. In this study MDS is used to locate the relative positions of cotton seed companies [7,8,9,10].

3. RESULTS AND DISCUSSION

3.1 Relative Positioning of Seed Companies through MDS

Perceived or psychological relationships among stimuli are represented as geometric relationships among points in a multidimensional space. These geometric relationships are known as spatial maps, the axis of same are assumed to denote the psychological bases respondent use to form perceptions and preferences for stimuli. MDS graphs are plotted on various seed companies to locate their relative positions.

1. Product elements: It includes performance of the product in the field, product packaging, product meeting customer satisfaction and brand name of the product influencing the organization profits

According to the data collected from the cotton seed dealers, the marketing strategies applied by the Nuziveedu, Kaveri and Rasi are similar when the Product element is considered. Whereas the strategies applied by the Nuziveedu, Tata Rallis and other cotton seed brands are different from one another.

2. Price elements: It includes price fixation as per market demand, discount facilities, credit facilities, adjusting price as per competitors and adherence to government price regulations.

According to the data collected from the dealers of cotton seed brands, the marketing strategies applied by the Kaveri and Rasi are similar when the Price element is considered.

Table 1. Goodness of fit measures for product elements

Normalized Raw Stress	.00080
Stress-I	.02836[a]
Stress-II	.06513[a]
S-Stress	.00242[b]
Dispersion Accounted For (D.A.F.)	.99920
Tucker's Coefficient of Congruence	.99960

1. Stress values are the indicative of the quality of MDS solutions. While R- square is a measure of goodness-of-fit, Stress is a measure of badness-of-fit. Stress values of less than 10% are considered acceptable. Stress Goodness-of-fit 0.2 – Poor, 0.1 – Fair, 0.050 – Good, 0.025 – Excellent, 0.000 - Perfect

2. Dispersion accounted for (DAF) is the indicative of goodness-of-fit. It is the value obtained through (1-Normalized raw stress). Higher the value, higher the goodness-of-fit.

3. Tucker's congruence coefficient is used to assess the similarity of factor interpretations. It is desirable to have a critical congruence level less than 1 which is regarded as indicative of identity of factors.

a. Optimal scaling factor = 1.001

b. Optimal scaling factor = 1.003

Table 2. Final Coordinates representing the seed companies on the basis of product elements

	Dimensions	
	1	**2**
KAVERI	-.561	-.070
RASI	-.169	-.138
NUZIVEEDU	-.681	.198
TATA RALLIS	.514	-.165
OTHERS	.898	.175

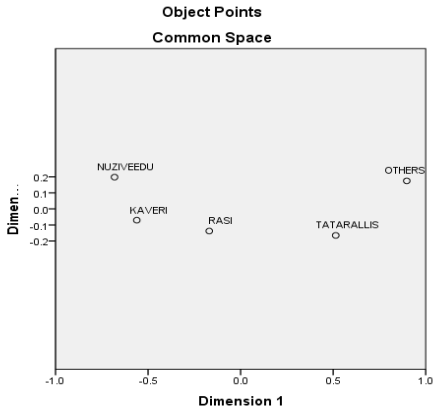

Fig. 1. MDS map of seed companies comparing the product elements

Table 3. Goodness of fit measures for price elements

Normalized Raw Stress	.00086
Stress-I	.02938[a]
Stress-II	.06802[a]
S-Stress	.00297[b]
Dispersion Accounted For (D.A.F.)	.99914
Tucker's Coefficient of Congruence	.99957

1. S-Stress value is 0.0297 which indicates Excellent Goodness-of-fit

2. Dispersion accounted for (DAF) value is 0.99914 which indicates Goodness-of-Fit.

3. Tucker's coefficient of congruence is less than one which is the indicative of goodness of fit

a. Optimal scaling factor = 1.001.

b. Optimal scaling factor = 1.001

Table 4. Final coordinates

	Dimensions	
	1	2
KAVERI	-.441	-.181
RASI	-.301	-.089
NUZIVEEDU	-.598	.342
TATA RALLIS	.370	-.280
OTHERS	.969	.208

But the marketing strategies applied by Nuziveedu, Tata Rallis and other cotton seed brands differ from one another when the Price element is considered.

3. Promotion elements: It includes product related demonstrations, advertisements, sales promotion, personal selling, posters, banners and other local promotional measures.

According to the data collected from the dealers of various cotton seed brands, the marketing strategies applied by Nuziveedu and Rasi are similar when the promotion element is considered.

Table 5. Goodness of fit for promotion elements

Normalized Raw Stress	.00023
Stress-I	.01523[a]
Stress-II	.03505[a]
S-Stress	.00073[b]
Dispersion Accounted For (D.A.F.)	.99977
Tucker's Coefficient of Congruence	.99988

1. S-Stress value is 0.0073 which indicates Excellent Goodness-of-fit.
2. Dispersion Accounted for (DAF) value for Promotion strategy is 0.99977 which is the higher value indicating Goodness-of-Fit.
3. Tucker's coefficient of congruence is less than one indicating Goodness of fit.
a. Optimal scaling factor = 1.000.
b. Optimal scaling factor = 1.006

But the marketing strategies applied by Kaveri, Tata Rallis and other cotton seed brands differ from one another when the promotion element is considered.

4. Place elements: It includes clear demarcation of market area, accessibility, promotion at different levels of channels, quick order and supply.

According to the data collected by different cotton seed dealers, the marketing strategies applied by Nuziveedu and Rasi are similar to each other when the distribution element is considered.

But the marketing strategies applied by Kaveri, Tata Rallis and other cotton seed brands differ from one another when the distribution element is considered.

Table 6. Final coordinates

	Dimensions	
	1	2
KAVERI	-.732	.191
RASI	-.183	-.125
NUZIVEEDU	-.462	-.047
TATA RALLIS	.454	-.239
OTHERS	.922	.221

Table 7. Goodness of fit measures for place elements

Normalized Raw Stress	.00034
Stress-I	.01834[a]
Stress-II	.04232[a]
S-Stress	.00108[b]
Dispersion Accounted For (D.A.F.)	.99966
Tucker's Coefficient of Congruence	.99983

Table 8. Final coordinates

	Dimensions	
	1	2
KAVERI	-.616	-.196
RASI	-.181	.112
NUZIVEEDU	-.613	.060
TATA RALLIS	.518	.228
OTHERS	.891	-.204

3.2 One Way ANOVA

3.2.1 Comparison of different product elements among different seed brands using ANOVA

3.2.1.1 Performance of the product in the field

It shows that there is no significant difference in the Performance of the product in the field among Kaveri, Rasi and Tata Rallis cotton seed companies. However, there is a significant difference between i. (1, 2, 4) seed companies and other seed brands, ii. (1, 2, 4) and Nuziveedu seed company. The values in the table explains that the dealers report on performance of the product is highest for Nuziveedu seeds. However Kaveri, Tata Rallis and Rasi have shown equivalently similar values which indicates performance of the product is in the same range for these companies.

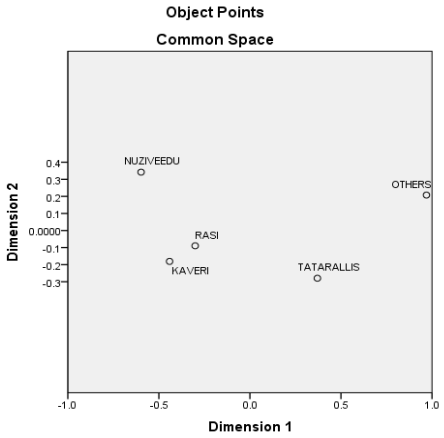

Fig. 2. MDS map of seed companies comparing the price elements

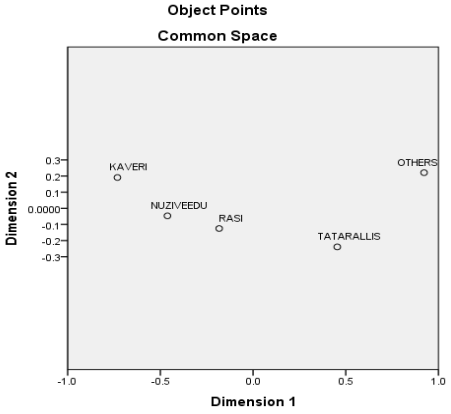

Fig. 3. MDS map of seed companies comparing the promotion elements

1. S-Stress value is 0.0108 which indicates Excellent Goodness-of-Fit
2. Dispersion Accounted for (DAF) value is 0.99966 which is the higher value indicating Goodness-of-Fit.
3. Tucker's coefficient of congruence is less than one indicating Goodness of fit.
a. Optimal scaling factor = 1.000.
b. Optimal scaling factor = 1.003

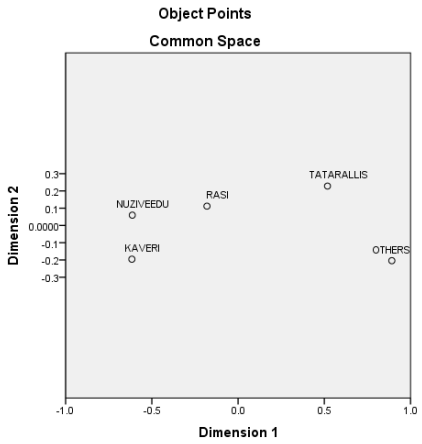

Fig. 4. MDS map of seed companies comparing the place elements

Table 9(a). ANOVA results for performance of the product in the field

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	18.956	4	4.739	6.394	<0.01
Within Groups	63.000	85	.741		
Total	81.956	89			

(b). Tukey B[a]

Cotton seed brand	N	Subset for alpha = 0.05		
		1	2	3
5	18	3.28		
2	18		3.83	
4	18		3.89	
1	18		4.22	
3	18			4.67

(1 = Kaveri, 2 = Rasi, 3 = Nuziveedu, 4 = Tata Rallis, 5 = Others (Ajith, Nidhi etc.)

3.2.1.2 Product packaging

The one way ANOVA shows that there is no statistically significant difference in the product packaging among all the cotton seed companies mentioned i.e., Kaveri, Rasi, Nuziveedu, Tata rallis and other brands like Ajith, Nidhi seeds etc.

This is because now a days each and every seed company is following excellent packaging without any spoilage or spillage of seeds during transport or carriage. Even dealers and farmers didn't complain much about the product packaging.

3.2.2 Comparison of different price elements among different seed brands using ANOVA

3.2.2.1 Price as per market demand

Results: The one way ANOVA shows that there is no statistically significant difference in the price of the seed as per the market demand among the Kaveri, Rasi, Nuziveedu and Tata Rallis. However there is a significant difference between seed brand 1,2,3,4 and the other seed brands (Ajith, Nidhi seeds etc.)

3.2.2.2 Adherence to government price regulations

RESULTS: The one way ANOVA shows that there is no statistically significant difference in the adherence to government price regulations among seed companies Kaveri, Rasi, Nuziveedu and Tata Rallis. However, there is a significant difference between seed brand 1,2,3,4 and other seed brands (Ajith, Nidhi etc.). The values in the table explains that almost all seed companies are following government price regulations without performing any malpractices as far as the price issue concerned.

Table 10(a). ANOVA results for product packaging

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.711	4	.178	1.167	.331
Within Groups	12.944	85	.152		
Total	13.656	89			

(b). Tukey B[a]

Cotton seed brand	N	Subset for alpha = 0.05
		1
4	18	4.78
5	18	4.78
3	18	4.89
1	18	4.94
2	18	5.00

(1 = Kaveri, 2 = Rasi, 3 = Nuziveedu, 4 = Tata Rallis, 5 = others (Ajith, Nidhi etc.)

Table 11(a). ANOVA results for price as per market demand

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	9.400	4	2.350	8.922	<0.01
Within Groups	22.389	85	.263		
Total	31.789	89			

(b). Tukey B[a]

Cotton seed brand	N	Subset for alpha = 0.05	
		1	2
5	18	4.00	
4	18		4.50
2	18		4.72
1	18		4.83
3	18		4.89

(1 = Kaveri, 2 = Rasi, 3 = Nuziveedu, 4 = Tata Rallis, 5 = others (Ajith, Nidhi etc.)

Table 12(a). ANOVA results for companies adherence to government price regulations

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.711	4	.178	4.857	.001
Within Groups	3.111	85	.037		
Total	3.822	89			

(b). Tukey B[a]

Cotton seed brand	N	Subset for alpha = 0.05	
		1	2
5	18	4.78	
1	18		5.00
2	18		5.00
3	18		5.00
4	18		5.00

(1 = Kaveri, 2 = Rasi, 3 = Nuziveedu, 4 = Tata Rallis, 5 = others (Ajith, Nidhi etc.)

3.2.3 Comparison of different promotion elements among different seed brands using ANOVA

3.2.3.1 Advertisements

Results: The one way ANOVA shows that there is no statistically significant difference in the advertisements among the Kaveri, Rasi and Nuziveedu seed companies. However, there is a significant difference between 1, 2, 3 and 4, 5 seed companies. The values in the table explains that Kaveri, Rasi and Nuziveedu seed companies is performing excellent advertisement promotional strategy when compared to Tata Rallis and other seed companies.

3.2.3.2 Sales promotion

Results: The one way ANOVA shows that there is no statistically significant difference in the sales promotion among all the seed companies i.e., Kaveri, Rasi, Nuziveedu, Tata Rallis and other brands (Ajith, Nidhi etc.). The values in the table explains that all the seed companies have least performance in sales promotion promotional strategy.

3.2.4 Comparison of different place elements among different seed brands using ANOVA

3.2.4.1 Market area clearly defined

Results: The one way ANOVA shows that there is no statistically significant difference in the cotton seed brands of (4, 2), (2, 3), (1, 3). Nuziveedu. However, there is a significant difference between seed brands (5, 4), (5, 2), (5, 3), (5, 1), (4, 3), (4, 1), (2, 3), (2, 1).

Table 13(a). ANOVA results for advertisements on products by companies

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	37.622	4	9.406	32.266	<0.01
Within Groups	24.778	85	.292		
Total	62.400	89			

(b). Tukey B[a]

Cotton seed brand	N	Subset for alpha = 0.05	
		1	2
5	18	3.17	
4	18	3.56	
2	18		4.56
3	18		4.61
1	18		4.78

(1 = Kaveri, 2 = Rasi, 3 = Nuziveedu, 4 = Tata Rallis, 5 = others (Ajith, Nidhi etc.)

Table 14(a). ANOVA results for providing sales promotion by the companies

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.044	4	.011	.042	.997
Within Groups	22.444	85	.264		
Total	22.489	89			

(b). Tukey B[a]

Cotton seed brand	N	Subset for alpha = 0.05
		1
2	18	1.67
1	18	1.72
3	18	1.72
4	18	1.72
5	18	1.72

Table 15(a). ANOVA results on clear demarcation of market areas by the companies

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	17.267	4	4.317	21.305	<0.01
Within Groups	17.222	85	.203		
Total	34.489	89			

(b). Tukey B[a]

Cotton seed brand	N	Subset for alpha = 0.05			
		1	2	3	4
5	18	3.72			
4	18		4.44		
2	18		4.56	4.56	
3	18			4.89	4.89
1	18				4.94

(1 = Kaveri, 2 = Rasi, 3 = Nuziveedu, 4 = Tata Rallis, 5 = others (Ajith, Nidhi etc.)

3.2.4.2 Quick ordering and supply

Results: The one way ANOVA shows that there is no statistically significant difference in the quick supply among the Kaveri, Rasi, Nuziveedu and Tata Rallis seed companies. However, there is a significant difference between the seed brand 5 and 1, 2, 3, 4 companies.

Table 16(a). ANOVA results for quick ordering and supply by different companies

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	18.156	4	4.539	21.044	<0.01
Within Groups	18.333	85	.216		
Total	36.489	89			

(b). Tukey B[a]

Cotton seed brand	N	Subset for alpha = 0.05	
		1	2
5	18	3.61	
4	18		4.56
2	18		4.67
1	18		4.78
3	18		4.83

(1 = Kaveri, 2 = Rasi, 3 = Nuziveedu, 4 = Tata Rallis, 5 = others (Ajith, Nidhi etc.)

3.3 Discussion

The article is based on the research results obtained from other studies by Kumar *et al*. on Marketing mix modification analysis by using Multidimensional Scaling. For Multidimensional Scaling analysis each of the respondents was asked to rate the dissimilarity between each of the brand by rating all these on a numerical scale. In the same way this study is conducted for comparison of marketing strategies of various cotton seed company brands in Telangana state by taking various parameters into consideration.

4. CONCLUSION

A strategy to improve access to markets by farmers has a potential of improving seed demand. So, any company has to follow some marketing strategies that improve the seed market demand and to gain a competitive advantage to compete with the neighboring seed companies. In this study, a detailed comparison on marketing strategies of leading cotton seed companies is done to analyze the reasons for their growth in the industry. The final results according to the study revealed mostly the strategies applied by Kaveri, Rasi and Nuziveedu are similar to one another. However the strategies applied by Tata Rallis and other brands differ from one another and also differ from the strategies applied by Kaveri, Rasi and Nuziveedu.

5. LIMITATIONS

1. The study limits to a specific location of southern Telangana state comprising of Jogulamba Gadwal, Mahabubnagar and Rangareddy districts because of large cultivation of cotton in these areas.
2. The study is done only on leading cotton seed companies in Telangana state because it is highly difficult task to obtain data of farmers using various cotton seed brands.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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