SUCCESSFUL FACTORS OF PALM OIL INDUSTRY IN THAILAND

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Abstract

The oil palm is considered as an economic crop associated with many Industry in terms of not only producing oil for consumption or in the food industry but also being processed into other products especially in relation to the energy sector which is currently used as an important ingredient of diesel base oil. The palm oil industry has continuously faced the problem of oversupply whereas oil palm farmers and palm oil industry entrepreneurs have faced unpredictable changes in market conditions causing unstable price of products. Additionally, high demand of raw material for palm oil processing plants drives an increase of the production cost and the entrepreneurs have not yet been able to effectively create and develop their marketing competitive potential and expansion of their products in both domestic and international markets. These are therefore the causes of business opportunity loss. This research study aims to 1) explore the variable level of competitive potential, entrepreneurial potential, management innovation, 8Ps marketing strategy and success of palm oil industry in Thailand, 2) examine the influence of the following variables; competitive potential, entrepreneurial potential, management innovation, 8Ps marketing strategy affecting the success of the palm oil industry in Thailand, and 3) develop a successful model of the palm oil industry in Thailand. The mixed research methodology was applied between quantitative and qualitative ones. In view of the quantitative term, the sample group comprised 400 palm oil entrepreneurs in Thailand with the sample size calculated by 20-time criteria of the observed variables and stratified random sampling. Data collection was conducted through questionnaires that were later analyzed by the structural equation modelling. For the qualitative term, an in-depth interview was made with 20 palm oil entrepreneurs and specialists in Thailand, the primary informants. The research findings revealed that 1) the variables; competitive potential, entrepreneurial potential, management innovation, 8Ps marketing strategy, and success of palm oil industry in Thailand are all at a high level, 2) competitive potential, entrepreneurial potential, management innovation and 8Ps marketing strategy influenced the success of palm oil industry in Thailand at .05 statistical significance level, and 3) the successful model developed by the researcher was namely "SPIP Model" (S = 8Ps Marketing Strategy, P = Entrepreneurial Potential, I = Management Innovation, P = Competitive Potential). Furthermore, the qualitative findings also revealed that to operate the palm oil industry in Thailand successfully, the entrepreneurs need to be aware of the competitive potential of this captioned industry particularly its market power from qualified palm oil to create a positive image to customers. The findings of this research can be further applied as a guideline to define the palm oil industry policy to promote sustainable success of palm oil industry in Thailand.

Keywords: Successful Factors/ Palm Oil Industry/Thailand.

1. INTRODUCTION

Currently, there is an increase in production and consumption around the world. In 2018, palm oil production was 70.6 million tons and its consumption was 66.4 million tons, accounting for 39.7 percent of all kinds of vegetable oil production. Pail oil, besides, was consumed by 38.6

percent of the total consumption of oils from all types of plants. The main production areas are Indonesia and Malaysia, with a combined share of 83.8 percent of world production. Both countries are major exporters in the world, while important importing countries are India, the European Union, China, Pakistan and other countries (Office of Agricultural Economics, 2017).

In 2020, world palm oil stocks are likely to decrease due to demand for consumption by India and China. Biodiesel production in Indonesia and Malaysia has increased more than increasing productivity. As a result, the average world palm oil price tends to increase. This is in line with the expansion of oil palm harvesting areas. Therefore, the world's palm oil production tends to increase continuously. Meanwhile, the European Union has a trend of slightly decreasing palm oil imports from the policy to reduce the use of biofuels in the transportation sector that are produced from plants that cause the use of areas with high carbon storage by which oil palm is one of the plants that are classified in this group. In addition, countries that produce palm oil for export and use domestically, such as Malaysia and Indonesia, tend to increase their use of palm oil domestically. This is because the governments of those two countries have turned to promoting the use of palm oil within the country. The Malaysian government announced an increase in the biodiesel mixing rate in diesel fuel from B10 in 2019 to B20, which will be a gradual increase in 2020 and will be used throughout the country before the midyear 2021 as well as aims to increase it to B30 in the future in order to reduce reliance on palm oil exports to the European Union market. Furthermore, the Indonesian government also announced an increase in the biodiesel mixing rate in diesel fuel from B20 in 2019 to B30 in January 2020 (Office of Agricultural Economics, 2021).

At present, the palm oil industry continues to face oversupply. Oil palm farmers and entrepreneurs still face market uncertainty and unstable prices due to market conditions. In addition, crude palm oil extraction plants must compete for raw materials, which will drive up the production cost of crude palm oil and affect overall income. Palm oil refinery may be pressured from other substitute products whose prices are likely to remain stable at a low level as well and traders of oilseed plants used in vegetable oil production that are affected by palm oil farmers. Therefore, it is necessary for the government sector to issue policies to support and promote so that the palm oil industry has the least impact and can continue to operate stably.

Another problem of the palm oil industry is Thailand's palm oil products are an import replacement industry because the production quantity is small compared to the consumption demand and they have high production costs compared to Indonesia and Malaysia, making them unable to compete with foreign countries and the market is quite limited. Most importantly, palm oil is also an environmental problem that is a general concern of consumers. In addition, there are production structure problems that affect operations. For example, the farmers, palm oil mills and refined oil refineries are separated in their operations, causing market instability and discontinued system. Using different innovations and technologies in each section makes the efficiency of upstream, midstream and downstream productions different (Kerdpitak et al., 2023), so the quality of palm oil products cannot be controlled to meet demand. This affects the palm oil market and business success. Additionally,

entrepreneurs are unable to build market competitiveness and develop palm oil products to expand the market in the country and abroad efficiently. As a result, the oil palm industry in Thailand is not successful and unable to build market power as well as loss business opportunity. The researchers are therefore interested in studying the success factors of the palm oil industry in Thailand to create sustainable market competitiveness for the palm oil industry in Thailand, being able to develop the stable economy of Thailand (Surat Thani Oil Palm Research Center, 2021; Office of Agricultural Economics, 2020).

2. LITERATURE REVIEW

2.1 Impact of Competitive Potential on Success of Palm Oil Industry

Competitive potential is the ability of the palm oil industry to provide high quality products in demand in the market. It creates a competitive advantage in the market of the palm oil industry in Thailand, success from the loyalty of farmers in selling their products, consistently high business profits and popularity in both domestic and international markets. It includes the quality products, market power and a good image from customers, detailed as follows: (Griliches, 1998; Porter, 1985; Porter, 1990; Kotler & Keller, 2016).

1. Quality products refer to the value and benefits of palm oil that other industries mix into consumer products or biomass fuel to be highly efficient, leading to customer satisfaction both within the country and abroad (Porter, 1980; Kotler & Keller, 2016).

2. Market power refers to competitive strength that has an advantage over competitors with high quality palm oil products. The market needs such products all the time. Customers are satisfied and have a good image of palm oil products (Kotler & Armstrong, 2012; Porter, 1990).

3. Good image from customers refers to customer attitudes that arise from experiences in using palm oil products, both for use in producing consumer products, including highly efficient biomass fuel production. As a result, there are a positive attitude towards oil palm products and the oil palm production industry (Griliches, 1998).

2.2 Impact of Entrepreneurial Potential on Success of Palm Oil Industry

At present, market competition in the palm oil industry, both domestically and internationally, is intense and more concentrated. Entrepreneurs in the palm oil industry therefore find ways to satisfy their customers in terms of producing high quality palm oil and reducing waste from production for environmental friendliness according to the market demand trend of public responsibility. Therefore, entrepreneurs must have the ability to create ideas adapted to new things in order to develop their business according to changes in the market and consumers constantly. Sourcing and producing high quality palm oil are supported by adopting modern technology in the production process from upstream to downstream (Khandker et al., 2010). In addition, entrepreneurs must be able to keep up with market changes both within the country and abroad in order to constantly change business models and be able to respond effectively to the market (Limsriwilai, 2011; Khandker et al., 2010). Entrepreneurial potential can also

contribute to the environmental sustainability of the palm oil industry because most mills use positive practices for environmental sustainability and the highest care for the environment is the disposal of solid waste. This makes the palm oil industry have high incomes. Adding value and zero waste can develop a good image of the business (Ryan et al., 2006). New challenges for the sustainability governance of the palm oil industry from voluntary certification schemes or eco-labels become the primary mechanism for improving production practices in complex commodity supply chains. They have become the standard for sustainable production. This results in small farmers having stability in their market power and being able to succeed efficiently through customer and market acceptance. Therefore, palm oil industry entrepreneurs can use their own potential to drive and participate in success (Ryan et al., 2006; Levent et al., 2012).

2.3 Impact of Management Innovation on Success of Palm Oil Industry

The palm oil industry has been able to compete effectively in the market. Entrepreneurs have brought new ideas and methods to use in management so that the palm oil industry can best meet the needs of customers and the market. In particular, the quality of palm oil can be used by other industries to produce consumer products, including biomass fuel, and be used according to desired goals. New ideas can also be used in various processes, including the production process, management process and service process for customers, partners and networks (Kerdpitak et al., 2022). In addition, new and creative management methods can be used to provide customer service and create customer satisfaction, affecting the power of market competition (Briggs et al., 2012; Barney, 1978).

Management innovation can increase the efficiency of biodiesel production from palm kernel oil and palm oil. Sustainable production in palm oil mills is achieved by adopting production methods and methods for reducing production waste and preventing pollution, which damages the environment. Entrepreneurs, therefore, use management innovations to produce more environmentally friendly products that have a positive impact on the palm oil industry and have greater competitiveness (Akdag & Zineldin, 2011; Khandker et al., 2010).

2.4 Impact of 8Ps Marketing Strategy on Success of Palm Oil Industry

The competitiveness of the palm oil industry stems from a marketing mix strategy that can meet the needs of customers. Trade partners and trading networks in the palm oil industry make customers satisfied in palm oil products in terms of utilization to other industries, both consumer and biomass fuel. This allows farmers to bring their produce to sell. The palm oil industry has higher incomes and has been accepted by both domestic and foreign customers. Marketing strategies can influence customer loyalty from customer satisfaction in the quality of palm oil products that can be used in other industries (Kerdpitak et al., 2023; Kotler & Keller, 2016). The 8Ps marketing mix strategy, consisting of product and service strategy, price strategy, place strategy, promotion strategy, process strategy, physical evidence strategy, personal strategy, and productivity and quality strategy, affect business success (Agarwal, et al., 2003; Kotler & Armstrong, 2012; Kotler & Keller, 2016).

2.5 Success of Palm Oil Industry

The success of the palm oil industry in Thailand from the upstream of oil palm plantation care and harvest to the midstream, the import of oil extraction plants, and to the downstream where the extracted oil is used in various forms to reach consumers throughout chain is critical to the success of the palm oil industry in Thailand. The entrepreneurs have created competitiveness by producing high quality palm oil as raw material to refine into quality palm oil. Using modern technological processes to extract crude and refined oils makes palm oil effective, resulting in greater market power. Ion removal of heavy metals of palm oil mill from increasing the absorbency of the hydrogel to remove heavy metals from industrial wastewater has a positive effect on the environment and will make the palm oil industry more competitive. Uses of palm oil and palm oil meal in the biofuel sector, bioenergy and transportation to replace conventional fossil fuels to reduce serious environmental problems are beneficial for the global energy transition. Biomass is a sustainable alternative for renewable resources that can produce cleaner, cheaper and future-ready energy sources. The palm oil industry is ideal for its abundant biomass resources by reducing environmental problems and being able to bring success to the oil industry sustainably (Praneetvatakul & Vijitsrikamol, 2020; Limsriwilai, 2011).

The competitiveness of palm oil has a positive effect on transportation as the biodiesel market continually since biofuels have been introduced to more than 60 countries around the world. A study of the challenges of the palm oil industry reveals that palm oil is a valuable product that is used worldwide in the production of many products for daily use. High quality palm oil can gain market competitiveness. The success of the palm oil industry is due to the output of oil mills that have market power that can be used both for consumption and making biodiesel. This makes the oil industry successful in both domestic and international markets (Praneetvatakul & Vijitsrikamol, 2020).

3. METHODOLOGY

This study was a mixed methods research by embedded design (Cresswell, 2003) to get the highlight of both quantitative and qualitative methods to better support the quality of the research (Johnson & Turner, 2003; Khandker, Koolwal and Samad, 2010). The population was 620 palm oil industry entrepreneurs in Thailand. In quantitative study, the multi-stage sampling was used to select 400 samples, calculated from 20 times greater than the numbers of observed variables (20x20) (Jackson, 2003; Hair, Ringle, & Sarstedt, 2011). The study started from quantitative research by reviewing the literature and related research on variables of success of palm oil industry in Thailand, consisting of competitive potential, entrepreneurial potential, management innovation and 8Ps marketing strategy. The data was synthesized and summarized into definition of terms. The indicators of variables according to the research concept were determined. The questionnaire was then constructed according to the 5-level Likert's scale (Likert, 1932), with the validity and reliability tests before collecting data and then statistically analyzing data by using structural equation modeling (SEM).

For qualitative research, the researchers concocted in-depth interviews from 20 palm oil industry entrepreneurs and experts by using purposive sampling technique. The qualitative data was complied, categorized, analyzed, interpreted and linked to draw conclusions on the results of the quantitative analysis with more depth, detailed, rational explanation.

4. RESULTS

This study used the analysis of exploratory data to test the relationship between the variables by examining the normal distributions of the 15 observed variables studied in the structural equation model, using the chi-square test (χ^2). If it was found to be statistically significant at the .05 level, it means that such variables were non-normally distributed. On the other hand, if it was found to be not statistically significant (P-value > .50), it means that such variables were normally distributed.

Table 1: Statistical Test of Empirical Variables (n=400)

Variables	M	S.D.	%CV	Sk	Ku	χ^2	P-value
DNVS	4.05	.51	12.59	-3.777	-9.309	100.932	.000
TNBS	3.87	.53	13.70	-0.979	-3.286	11.757	.003
MLCH	4.00	.53	13.25	-3.251	-6.776	56.484	.000
PDSG	4.05	.52	12.84	-4.211	-6.669	62.200	.000
PCSG	3.94	.55	13.96	-2.715	-4.841	30.805	.000
DTSG	3.63	.60	16.53	-1.168	0.296	1.452	.484
MPSG	3.78	.58	15.34	-1.514	-2.451	8.301	.016
PGSG	3.99	.57	14.29	-4.309	-4.641	40.105	.000
SLSG	4.12	.51	12.38	-5.981	-3.639	49.017	.000
NRSG	3.68	.57	15.49	-0.841	0.571	1.033	.597
PWSG	3.77	.56	14.85	-1.017	-1.541	3.407	.182
PDSD	3.66	.64	17.49	-1.589	-2.068	6.802	.033
PRCS	3.70	.61	16.49	-1.578	-0.412	2.660	.265
SRVE	3.80	.56	14.74	-1.186	-1.955	5.227	.073
QLPD	3.73	.58	15.55	-0.979	-1.446	3.049	.218
MKPW	4.11	.52	12.65	-5.558	-4.462	50.801	.000
IMCM	3.90	.55	14.10	-2.036	-3.887	19.256	.000
LYFM	3.81	.59	15.49	-1.909	-3.104	13.279	.001
CHPF	3.97	.56	14.11	-3.584	-4.967	37.516	.000
POPU	3.74	.62	16.58	-2.026	-1.899	7.712	.021

Note: chi-square (χ^2) with statistical significance (P-value <.05) indicates a non-normal distribution

The result of normal score examination by chi-square (χ^2) of empirical variables, comprising place strategy (DTSG), public relation strategy (NRSG), process (PRCS), service (SRVE), and quality product (QLPD), were not statistically significant (p > .05), indicating that such empirical variable had a normal distribution. While, the remaining empirical variables were tested and found to be statistically significant (p < .05), indicating that most of the empirical

variables in the model had a non-normal distribution. When considering the concept of Kelloway (1998) which proposed that a large sample size (n≥400) could be statistically relegated that the data measured with the scale questionnaire have a normal curved distribution, according to The Central Limit Theorem (Kelloway, 1998).

Such results may cause the problem in an empirical model fit assessment by of the chi-square test (χ^2). The researchers therefore solved by finding the relative chi-square (χ^2 /degree of freedom). If the value was less than 5.00, it indicated that the model was empirically fit, although the model χ^2 test was statistically significant (p-value < .05) (Vanichbuncha, 2013; Hair, et al., 2006).

Table 2: Factor Loadings (n = 400)

| Variables	Factor Loading (λ)	Error (θ)	t	R^2
Entrepreneurial potential (ETPTT)				
Dynamic vision (DNVS)	.76	.43	10.65	.57
Technological adoption in business (TNBS)	.74	.41	8.71	.59
Keeping up with marketing change (MLCH)	.55	.49	8.91	.51
8Ps marketing strategy (MKSG)				
Modern marketing communication (MDNMK)	.77	.47	11.45	.53
Product strategy (PDSG)	.75	.44	14.76	.56
Price strategy (PCSG)	.50	.45	9.22	.55
Place strategy (DTSG)	.59	.46	11.68	.54
Promotion strategy (MPSG)	.63	.40	12.84	.60
Packaging strategy (PGSG)	.73	.46	14.22	.54
Personal strategy (SLSG)	.70	.44	7.59	.56
Pubic relation strategy (NRSG)	.70	.44	7.65	.56
Power strategy (PWSG)	.77	.47	11.45	.53
Management innovation (MMIN)				
Product (PDSD)	.72	.48	12.31	.52
Process (PRCS)	.67	.46	11.62	.54
Service (SRVE)	.71	.42	10.92	.58
Competitive potential (CPPT)				
Quality product (QLPD)	.49	.36	7.65	.64
Marketing power (MKPW)	.50	.35	7.69	.65
Good image from customers (IMCM)	.82	.33	9.80	.67
Success of palm oil industry in Thailand (SPOI)				
Loyalty of farmers in selling products (LYFM)	.79	.38	11.57	.62
Continuous high business profits (CHPF)	.56	.39	9.36	.61
Popularity in both domestic and foreign markets (POPU)	.56	.39	9.34	.61
ρ_c= .76 ρ_v = .52				
Chi-Square=0.00, df=0, P-value=1.00000, RMSEA=0.000				

Table 3: Measurement Model (n=400)

Dependent variable	R^2	Effects	Independent variable			
			Competitive potential (CPPT)	Entrepreneurial potential (ETPTT)	8Ps marketing strategy (MKSG)	Management innovation (MMIN)
Competitive potential (CPPT)	.93	DE	-	.56*(6.23)	.79*(6.21)	.75*(7.26)
		IE	-	-	-	-
		TE	-	.56*(6.23)	.79*(6.21)	.75*(7.26)
Success of palm oil industry in Thailand (SPOI)	.91	DE	.70*(4.70)	.54*(7.53)		.49*(4.62)
		IE	-	.30*(6.23)	.87*(8.21)	.34*(6.26)
		TE	.70*(4.70)	.84*(7.22)	.87*(8.21)	.83*(7.33)
χ^2= 243.05 df =134 p-value = .00000 , χ^2 / df = 1.81, RMSEA = .049, RMR = .019, SRMR = .047, CFI =.98, GFI = .94, AGFI = .91, CN = 267.16						

* Statistically significant at the .05 level

Note: In parentheses, they were the t-value. If the value was not between -1.96 and 1.96, it was statistically significant at the .05 level. DE = Direct Effect, IE=Indirect Effect, TE=Total Effect
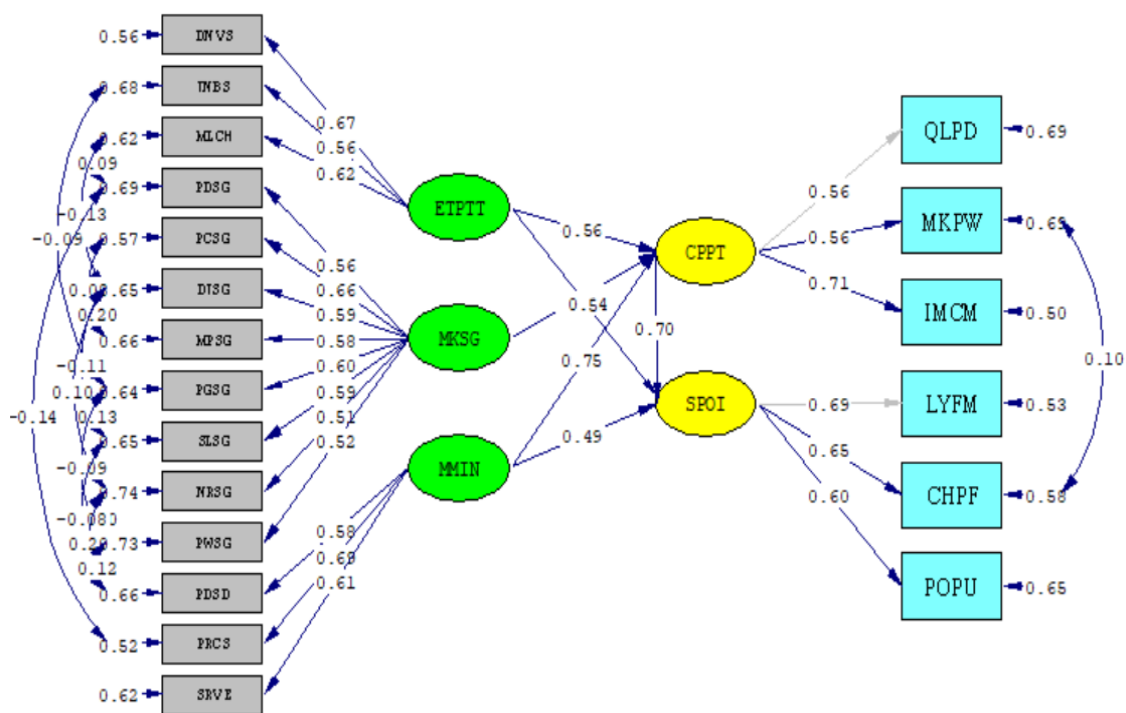
Chi-Square=243.05, df=134, P-value=0.00000, RMSEA=0.049

Figure 1: Adjusted Model (n=400)

The study concluded that model fit indexes of the adjusted structural equation model was fit to the empirical data, which was considered from the fit indexes as follows: χ^2= 243.05 df =134 p-value = .00000, χ^2 / df = 1.81, RMSEA = .049, RMR = .019, SRMR = .047, CFI =.98, GFI = .94, AGFI = .91, CN = 267.16. As a result, parameter estimation in the model was acceptable.

5. CONCLUSION

The adjusted structural equation model of the effects of competitive potential, entrepreneurial potential, management innovation and 8Ps marketing strategies on the success of the palm oil industry in Thailand is fit to the empirical data at an acceptable level, which is considered from the fit indexes as follows: χ^2= 243.05 df =134 p-value = .00000, χ^2 / df = 1.81, RMSEA = .049, RMR = .019, SRMR = .047, CFI =.98, GFI = .94, AGFI = .91, CN = 267.16.. The estimation in the structural equation model is as follows:

1. Entrepreneurial potential (ETPTT) has a direct effect on success of palm oil industry in Thailand (SPOI) with the effect coefficient of .54*(7.53) and a statistical significance at the .05 level. It is in line with the hypothesis 1: Entrepreneurial potential directly affects the success of palm oil industry in Thailand.

2. Entrepreneurial potential (ETPTT) has a direct effect on competitive potential (CPPT) with the effect coefficient of .56*(6.23) and a statistical significance at the .05 level. It is in line with hypothesis 2: Entrepreneurial potential directly affects competitive potential.

3. 8Ps marketing strategy (MKSG) has a direct effect on competitive potential (CPPT) with the effect coefficient of .79*(6.21) and a statistical significance at the .05 level. It is in line with hypothesis 3: 8Ps marketing strategy directly affects competitive potential.

4. Management innovation (MMIN) has a direct influence on competitive potential (CPPT) with the effect coefficient of .75*(7.26) and a statistical significance at the .05 level. It is in line with hypothesis 4: management innovation directly affects competitive potential.

5. Management innovation (MMIN) has a direct effect on success of palm oil industry in Thailand (SPOI) with the effect coefficient of .49*(4.62) and a statistical significance at the .05 level. It is in line with hypothesis 5: management innovation directly affects success of the palm oil industry in Thailand.

6. Competitive potential (CPPT) has a direct effect on success of palm oil industry in Thailand (SPOI) with the effect coefficient of .70*(4.70) and a statistical significance at the .05 level. It is in line with hypothesis 6: competitive potential directly affects success of palm oil industry in Thailand.

7. 7.Competitive potential (CPPT), entrepreneurial potential (ETPTT) and management innovation (MMIN) can jointly predict success of palm oil industry in Thailand (SPOI) by 91%.

8. Entrepreneurial potential (ETPTT), 8Ps marketing strategy (MKSG) and management innovation (MMIN) can jointly predict competitive potential (CPPT) by 93%.

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