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Diagnosing Culture Variables to Enable Successful TQM Implementation in Libyan Manufacturing Companies

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Abstract: This paper investigates the current status of cultural variables in Libyan manufacturing companies in order to provide a basis for TQM framework design. In order to achieve the objectives, an extensive literature review has been carried out, followed by a survey questionnaire conducted in major Libyan manufacturing industries (Oil and Gas Sector and Industrial Sector). SPSS software was used to perform the analysis. We found that the Libyan manufacturing culture comprises high power distance, slightly high uncertainty avoidance, long-term orientation and a masculine society. We also found that the society is average in terms of its individualistic/collectivistic dimension and that organizations are operating within the hierarchy culture quadrant. The findings were compared with other studies and suggestions were formulated to improve Libyan companies in the future.

Key words: TQM · National culture · Organizational culture · Manufacturing companies · Libya

INTRODUCTION

Culture includes beliefs, knowledge, morals, law, art, customs and any other capabilities and habits acquired by man as a member of society [1]. It is a system of shared meanings that distinguishes one organisation from others [2] and plays a major role as a variance-causing factor in TQM deployment programs. In order to be successful, all parts of the organisation should work together towards achieving common objectives, bearing in mind that every employee and each activity affects and in turn is affected by others. Organizations today aspire towards a higher level of effectiveness and indications are that TQM is a strategy that will help their business in this respect [3].

Total Quality Management literature indicates that culture is a very important variable in the success or failure of TQM deployment and TQM gurus have stressed the development of a quality culture in effective organisations [4-7]. Pun [8] concluded that organizations with the right quality culture will achieve higher efficiency and better performance. Adam *et al.* [9] concluded that no two regions in the world (Asia, Europe or North America) were similar in terms of the models that define TQM implementation. When making changes such as TQM implementation in organizations, different problems arise in different countries and the method of implementation can vary due to differences in culture [10]. 75% of Total Quality Management efforts have either failed or experienced problems which might affect the existence of the organisation [11].

There is evidence that proper TQM implementation improves organizational performance and adds valuable benefits: fewer defects, minimising of rework and scrap, control of inventory levels, optimisation of lead times, greater flexibility and maximum employee satisfaction [12]. Meanwhile many reports claim that TQM failures are due to implementing techniques imported from other countries without taking into account the different cultural values. Organizational culture is an essential factor in adopting any successful change in an organisation [11] and TQM programs will succeed if the values and philosophies proposed by TQM teams are suited to the organisational culture. The success of TQM implementation will depend to a large extent on the organizational culture [13], thus it is essential to formulate a TQM framework that takes into consideration the organisation cultural modes [14].

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Table 1: TQM implementation approach as a function of national culture elements

		Power Distance	
		Low	High
Uncertainty Avoidance	Low	Tendency to focus on individual workers. Training of workers is emphasized. Responsibility is with the workers.	-
	High	Tendency to focus on routines and procedures to be followed by the workers. Training of workers is emphasized. Responsibility is in the system.	Tendency to focus on leaders, leadership and management. Responsibility is with the leaders.

Source: Lagrosen [21]

National and organizational cultures are closely related and companies cannot create an organization culture that differs from the national culture [10]. The successful implementation of Total Quality Management requires changes in organizational values to harmonize with TQM values [10] and involves radical changes in political, structural and cultural dimensions to form the basis of modern management practices [15]. A study in a Sri Lankan hospital identified the impact of national cultural characteristics as low masculinity, low individualism, low power distance and low uncertainty avoidance and on TQM practices the study identified high staff commitment, high senior management commitment, high integration of continuous improvement, high stakeholder focus, high measurement and feedback, high quality culture and high learning organization and concluded that national culture variables of the hospital have positively impacted on its TQM practices [16]. Another study by Tata and Prasad [17] found that companies with a national culture of high uncertainty avoidance and high power distance are most likely to have a control-oriented culture which is not conductive to TQM implementation; companies with a national culture of low uncertainty avoidance and low power distance are likely to have a flexible culture that is conducive to the success of Total Quality Management implementation.

National culture elements influence the success and failure of TQM implementation. Studies have identified the national culture variables that have an influence on the adoption and implementation of TQM [10, 17-21]. Lagrosen [21], in his study conducted in four European countries, showed that power distance and uncertainty avoidance affect TQM implementation, as shown in Table 1.

Through literature review studies, national cultural elements conducive to successful TQM implementation have been identified: low power distance [10, 16-17, 22-23]; low uncertainty avoidance [10, 16-17, 22-23]; a more feminine society [16, 18], collectivism [16-17, 19, 22-23] and long-term orientation [19]. Those factors must be present in any organization and country if they are to achieve successful deployment of Total Quality Management, as they have been found to be the best facilitators and supporters for TQM.

TQM implementation in any culture will lead to a fusion between TQM principals and cultural values, creating a culture-specific TQM with its own unique manifestations and operations, all leading towards the fundamental objective of quality improvement [14]. Dellana and Hauser [24], in their study of the relationship between organizational culture and TQM, found that higher Baldrige scores are significantly related to the clan and adhocracy cultural types. Al-Khalifa and Aspinwall [20] determining the organizational culture types in Qatari industry, found that Qatari companies are facing difficulties in implementing TQM due to the fact that they are dominated by a hierarchal and market culture. They proposed a framework to move towards a more flexible people-oriented style: a clan and adhocracy culture. Cameron and Quinn [11] noted that government-owned organizations fall into the hierarchical culture quadrant and Prajogo and McDermott [25] concluded that market or hierarchical culture exists within manufacturing companies, whereas the ideal culture profile that supports TQM deployment should have developmental and clan characteristics [20, 24]. Since all Libyan manufacturing companies under study are owned by the government and are operating in a culture of high power distance and high uncertainty avoidance [26-27], we expect them to be operating within the hierarchical and/or market culture quadrant [28].

To determine the organisational culture type that operates within an organisation, the behaviour, attitudes, values and belief system of the employees must be studied in detail. The use of a competing values

framework (CVF) helps in determining the existing organisational culture type [11, 20]. Hofstede [26], in his study of the national culture of the Arab region and Twati's [27] study on the Libyan Oil and Gas industry and Banking sector, both found that Libyan culture contains high power distance, high uncertainty avoidance, collectivism and a moderately masculine society. These values indicate that the Libyan organization culture will lean more towards control-oriented cultures and mechanistic structures which are not conducive to TQM implementation. Empirical research is required to identify and highlight the culture variables in Libya; a country that has just opened its economy to foreign investment after enduring international sanctions over an extended period of time (1986-2004). In this study, national and organizational culture variables will be determined. Results and knowledge gained should be of importance to the Libyan government, especially the National Oil Corporation (NOC) and the General People's Committee for Industry, Economy and Trade in their policy-related decision making processes. Furthermore, results will provide guidance to the organizations that are considering changes in general and TQM in particular.

National and Organisational Culture Variables: Hofstede's framework was based on the assumption that people around the globe are guided and driven by different attitudes, beliefs, morals, customs and ethical standards. Societies have different traditions, religions and rituals and have different ways of dealing with family issues, work matters, social occasions and their personal responsibilities [29]. Hofstede [26] addressed five dimensions of national culture values:

Power Distance: Power distance is a measure of how much the lower members of hierarchical organizations accept the fact that wealth and power are not distributed equally. Low vs. high power distance measures the way individuals accept the differences in power levels.

Individualism: This dimension measures whether individuals prefer to work in groups and how much they define themselves as separate from their group membership. In an individualistic society, members mainly look after their own and their immediate family members' interests and they are expected to choose their own affiliations and to develop and display their individual personalities.

Masculinity: This dimension is to measure male or female values and the degree of difference in the social role between the genders. In a masculine culture, people value assertiveness, competitiveness, ambition and the accumulation of wealth and material possessions. In this type of dimension, female members tend to care for the non-materialistic needs, while male members are expected to attend to materialistic needs. In a feminine culture, people value relationships and quality of life. Collectivistic societies tend to have a higher masculinity content, in which the difference in social role between the genders is more distinct.

Uncertainty Avoidance: This dimension measures how people attempt to cope with anxiety by minimizing uncertainty. It refers to the way in which people deal with the future and whether they have full control or no control over different types of events. A society with low uncertainty avoidance requires structure and order, with very clear rules and guidance. Those societies tend to be more risk taking, more tolerant to change and more aggressive. A society with high uncertainty avoidance tends to be more security-seeking, intolerant to change and less aggressive.

Long Vs. Short Term Orientation: This dimension measures the degree to which members embrace planning and investing for the future. This dimension indicates a society's time perspective and attitude to overcoming obstacles with time. In short-term oriented societies, members of the society value actions and attitudes that are affected by the past or the present. In long-term oriented societies, members value actions and attitudes that affect the future.

Cameron and Quinn [11] have developed a framework for organisational culture called a "Competing Values Framework" (CVF). This can be used to determine if an organisation is internally or externally focused and if the organisation is looking for stability and control or flexibility and individuality. The CVF framework structure is based on six organisational culture dimensions (organisational leadership, organisation glue, dominant characteristics, management of employees, strategic emphases and success criteria), and four dominant cultures (i.e. clan, hierarchy, adhocracy and market). The competing values framework for cultural assessment is divided into two dimensional patterns, namely horizontal (internal/external) and vertical (stability/flexibility) as shown in Figure 1:

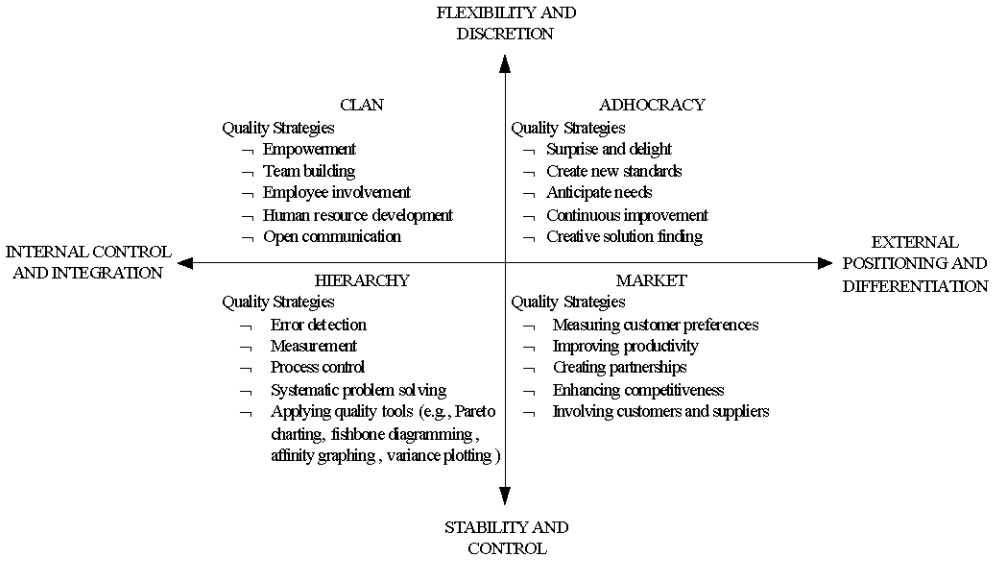

Fig. 1: The competing values of Total Quality Management
Source: Cameron and Quinn [11]

Horizontal (Internal/external): The horizontal axis indicates which direction (internal or external) the organisation focuses on. Towards the left end of the axis, an organisation's attention is primarily internal, where customer focus and competition are not recognized as key elements. Towards the right, an organisation's attention is primarily external, where customers and suppliers are recognised as the most important elements.

Vertical (Stability/flexibility): This axis indicates who makes decisions in an organisation. At the top, employees are empowered to decide for themselves, whereas at the bottom, the management is in control. Flexibility becomes more important than stability when environmental forces produce a need for change.

The Competing Values Framework (CVF) can help to construct an organisation culture profile. Through the use of the Organisational Culture Assessment Instrument (OCAI), an organisation culture profile can easily be drawn by establishing the organisation's dominant culture type characteristics [30]. The competing values framework can be helpful in organising the various aspects of TQM [11]. The overall culture profile of an organisation is presented as follows:

Hierarchy Culture: An organisation that focuses on internal maintenance and requires stability and control [30]. The hierarchy culture has a structure resulting from a strict chain of control, driven by formal rules, procedures and policies. Stability, predictability, dependability and employment security are highlighted [11]. People in hierarchy culture organisations have respect for higher levels of power and position and there are usually well-defined policies, procedures and processes. Managers are typically organisers and coordinators who keep watch over what is happening.

Market Culture: An organisation that focuses on external maintenance and requires stability and control [30]. Market culture is not only focused on marketing, but all transactions are viewed in market terms. In a market culture organisation, values flow with minimal delay and cost. Market cultures are driven by results and are very competitive and outward looking. Managers in a market culture are hard-driving competitors and always focus on achieving goals.

Clan Culture: An organisation that focuses on internal maintenance with flexibility, concern for people and sensitivity towards customers [30]. Clan culture organisations focus less on control and more on flexibility, people are driven by output, shared goals, vision and outcomes. Organisations with this type of culture have a sense of family and people work well together, being driven by a strong sense of loyalty to each other. Managers act in a supportive, facilitative way and may take on a parental role.

Adhocracy Culture: An organisation that focuses on external positioning with a high degree of flexibility and individuality [30]. The adhocracy has greater flexibility and independence than the clan. The adhocracy culture will manage by forming teams to face new challenges and it will depend on experimentation rather than long-term projects and development. Managers are innovative entrepreneurs and take calculated risks to make important and significant gains.

Research Method and Survey Instrument: In order to identify the management styles within Libyan manufacturing companies, an extensive literature review was carried out to understand the different culture variables and TQM culture requirements. This was followed by a survey questionnaire conducted in major Libyan manufacturing companies (Oil and Gas industry, Cement industry, Steel industry, Electric and Power industries, Agro-food industry, Textile and Plastics industries and Wood industry). The questionnaire was designed in three main parts:

Part A: General questions investigating the characteristics of the surveyed companies and the respondent's details. Questions in this part were in the form of Yes / No answers.

Part B: National culture elements. This part was adopted from Jung *et al.* [19] and the five descriptions matched the definitions of each of the five culture types (power distance, individualism, masculinity, uncertainty avoidance and long-term orientation). Respondents were asked to rate their current national culture on a 5-point Lickert scale. There were ten questions and each pair of consecutive questions was assigned to address one national culture variable.

Part C: Organization culture elements. The Competing Values Framework (CVF) of Cameron and Quinn (1999) was used, the four descriptions matching the definitions of each of the four culture types (i.e. clan, hierarchy, adhocracy and market). Respondents were asked to describe their current organization culture. There were six questions, each question having four alternatives. The respondent was asked to divide 100 points among the four alternatives, based on the extent to which each alternative fitted their organization.

A professional English-Arabic translator converted the questionnaire into Arabic and then the Arabic version was translated back into English and checked for consistency. A total of 311 copies were distributed to participants selected at random, holding different levels of management position at selected organizations. Out of the 311 copies, 238 were returned, of which 226 were suitable for data analysis, giving a response rate of 76.5 %. The questionnaire was carried out in July - September 2009. Each copy of the questionnaire was accompanied by a formal letter providing an explanation of the research being conducted and supplying contact details in case of any inquiry or clarification. There was no attempt to identify names or job titles, so that all information was anonymous and confidential.

RESULTS AND DISCUSSION

Data from different industrial sectors were carefully collected, checked for unanswered questions, treated, screened and analyzed using SPSS 18 software. Table 2 shows the size of the companies involved in the study, large companies being considered as having more than 500 employees (F1,Oil and Gas; F2,Cement; F3, Steel; F5, Electric and Power Industry), whereas medium companies had 100 to 500 employees (F4,Agro-Food; F6,Textile and Plastic; and F7,Wood Industry).

A reliability test (Alpha) was carried out for each element and for the entire questionnaire. The Cronbach alpha value was found to be 0.76 and as a Cronbach alpha value of $\alpha \geq 0.7$ is considered to be acceptable [31], it was apparent that the questionnaire was reliable. In order to evaluate the inter-correlations among the national culture elements, factor analysis was performed. Table 3 summarizes the varimax rotated matrix which extracts five factors accounting for about 77% of the total variation. Items with loadings < 0.5 were dropped and items with higher loadings were considered to be significant and to have an influence on the label selected to present a factor [32].

The mean of the national culture variables were tabulated and converted in a percentage scale and included in Table 4 to enable comparison of the current study results with those of previous studies by Hofstede [26] and Twati [27].

A bar chart constructed for comparison and shown in Figure 2, it indicates that power distance is considered to be high in all studies, uncertainty avoidance is slightly high in this study whereas it was high in the Hofstede [26] and Twati [27] studies. Hofstede [26] and this study consider Libyan culture to be masculine,

Table 2: Company size

	Business area	Medium size 100-500 employees	Large size ≥ 501 employees
F1	Oil and gas		√
F2	Cement		√
F3	Steel		√
F4	Agro-food	√	
F5	Electrical and power		√
F6	Textile	√	
F7	Plastic and wood	√	

Table 3: Varimax rotated factor matrix

Item no.	Power Distance (PD)	Individualism (IDV)	Masculinity (MAS)	Uncertainty Avoidance (UAI)	Long Term Orientation (LTO)
B1	.872				
B2	.890				
B3		.853			
B4		.864			
B5			.826		
B6			.839		
B7				.842	
B8				.837	
B9					.888
B10					.905

Table 4: Libyan national culture, a comparison with previous studies

	PD	IDV	MAS	UAI	LTO
Hofstede [26]	80	38	52	68	-
Twati [27]	72	18	45	71	-
Current study	75	50	62	54	68

Table 5: Organizational culture vs. business type

			Type of company				
S. N.			Oil and gas	Industrial sector	Medium size	Large size	All
1	Clan Culture (CC)	Mean	23.2	25.3	25.2	23.9	24.2
		SD	8.0	7.8	8.1	7.9	8.0
2	Adhocracy Culture (AC)	Mean	18.3	17.7	17.8	18.1	18.0
		SD	5.0	5.5	5.7	5.1	2.2
3	Market Culture (MC)	Mean	26.7	25.5	25.4	26.4	26.1
		SD	6.1	6.5	6.0	6.4	6.3
4	Hierarchy Culture (HC)	Mean	31.8	31.5	31.6	31.6	31.7
		SD	8.3	9.1	6.7	8.4	8.7

whereas according to Twati's study it is feminine. The current study found that Libyan culture is average in the individualistic/collectivistic dimension, whereas it was deemed collectivistic by both Twati and Hofstede. Long-term orientation in Libya was studied for the first time and found to be high, which means that Libyan society members value actions and attitudes which affect the future. The authors argue that the differences in results to other studies are due to the time difference and type of organizations studied. Hofstede's study was based on regional estimated values conducted in 1984 (26 years previously), while Twati's study was based on data conducted in 2004 (six years before) and within Oil and Gas companies and the Banking sector.

Mean and standard deviations of the four organizational culture elements (clan, adhocracy, market and hierarchy) were tabulated. The Libyan manufacturing companies under study were divided into: Oil and Gas companies, Industry sector companies and Medium/Large size companies as shown in Table 5. Values were plotted

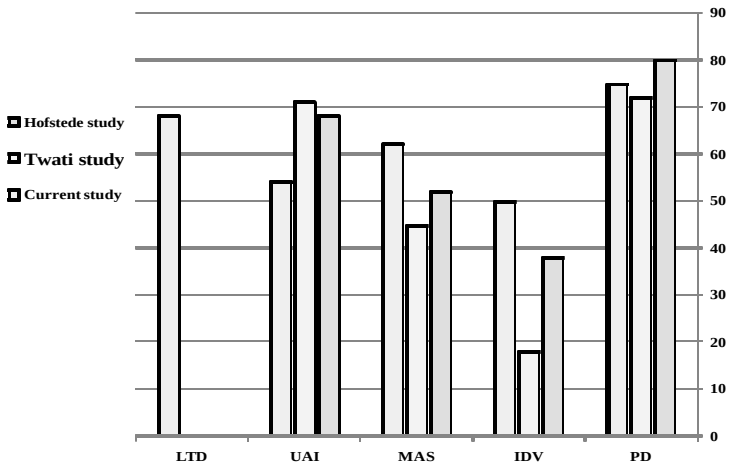

Fig. 2: Libyan national culture

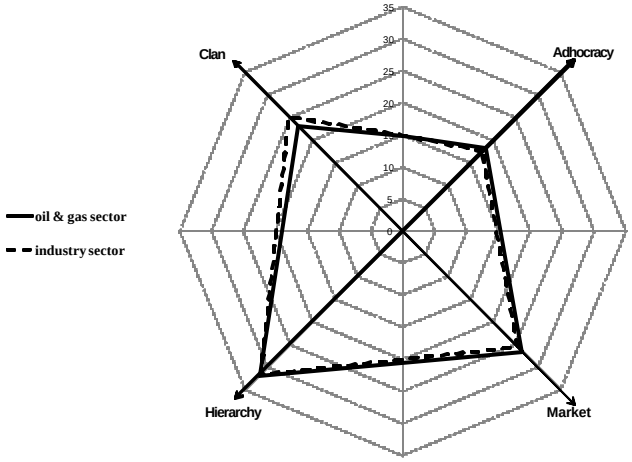

Fig. 3: Profiles of Oil & Gas and Industrial sectors

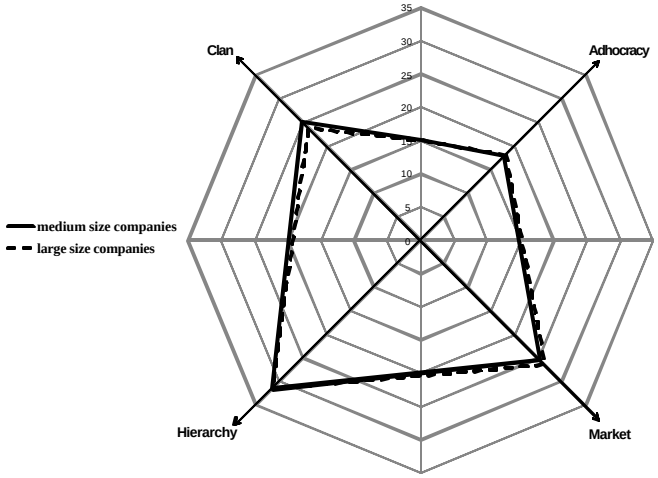

Fig. 4: Profiles of medium and large size companies

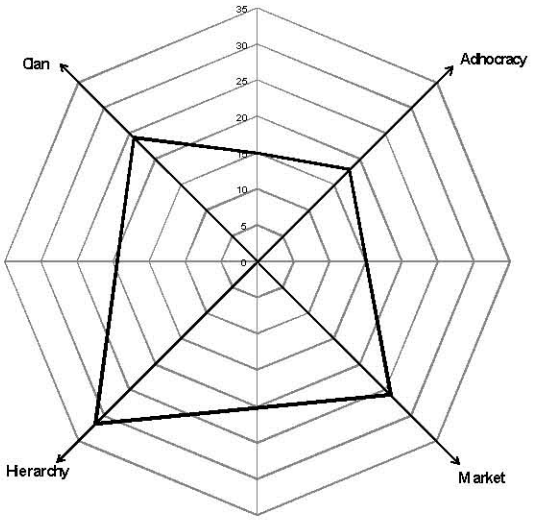

Fig. 5: Profile of Libyan manufacturing companies

to provide a clear picture of the current organization culture operating within Libyan manufacturing companies. Figure 3 shows the profiles of Oil and Gas and Industry sectors, Figure 4 shows the profiles of Medium and Large size companies. Similarities between organizational culture profiles exist within the Oil and Gas and Industry sectors and within the medium and large size companies. The Libyan organizational culture profile fell predominantly within the hierarchy culture quadrant (lower left quadrant) as shown in Figure 5.

CONCLUSION

National Culture Elements Within Libyan Manufacturing Companies Were Found to Be:

- High power distance
- High masculinity
- Long-term orientation
- Slightly high uncertainty avoidance
- Moderate individualism/collectivism

The organizational culture profile within Libyan manufacturing companies was found to be predominantly in the lower left quadrant (hierarchy) of the competing values framework. Successful implementation of TQM requires low power distance, a feminine society, long-term orientation, low uncertainty avoidance, a collectivist society. An organization culture profile that supports TQM implementation should have clan and/or developmental characteristics.

This is the most recent study investigating the national and organization culture profiles within Libya. It makes a contribution by providing an insight into which cultural values are operating within the society and adds the long-term orientation dimension to the Libyan national culture. Findings will be used for a TQM framework design to be implemented in Libyan manufacturing companies.

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