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Research Article

Exploring Factors Influencing Consumer Purchase of Intangible Cultural Heritage: A Case Study of Lacquerware in Liangshan Prefecture, China

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ABSTRACT

This study investigates the multifaceted factors that influence consumer purchasing decisions regarding intangible cultural heritage products, focusing on lacquerware in Liangshan Prefecture, China. Intangible cultural heritage represents a unique intersection of tradition, craftsmanship, and cultural significance, contributing to a region's identity and heritage preservation. In the context of lacquerware, this research aims to discern the key elements shaping consumer behaviors and choices. The research methodology employs a combination of qualitative and quantitative approaches, including surveys, interviews, and observation, to gather comprehensive insights. Key factors explored include cultural appreciation, product authenticity, perceived value, social influence, and marketing strategies. Through a thorough analysis, the study aims to delineate the intricate relationships between these factors and consumer preferences in the context of intangible cultural heritage. The findings of this research contribute to both academic scholarship and practical applications in the fields of heritage preservation and marketing. Understanding the factors influencing consumer behavior towards intangible cultural heritage products can aid policymakers, marketers, and local artisans in developing effective strategies to promote and sustain these traditional crafts. Additionally, the study underscores the importance of preserving and promoting cultural heritage as an integral part of sustainable development, ensuring the continued vitality of these unique traditions in a rapidly changing global market.

Keywords: cultural heritage modelling, Lacquerware, Liangshan Prefecture, quantum photonics, machine learning model

1. Introduction:

China is a global country with 56 ethnic gatherings (55 of them being ethnic minorities) spreading across this incredible land. Yi public, 6th biggest ethnic minority in China, have fostered south-western district of China as well as added to its social and authentic advancement [1]. One of the Chinese minority cultures with special significance and a wealth of cultural connotations is the Yi nationality's culture, which is also an essential component of Chinese minority culture. Yi ethnic group's long history of culture is beautiful, and in particular, the use of colors by this group perfectly reflects its people's emotions, lives, and natural surroundings [2]. According to the viewpoint of Yi ethnic gathering's variety culture, their love for colors, tasteful thoughts, ethnic sentiments, this paper dissects elements of varieties utilized by Yi public, their one of a kind variety

culture, thoughts, and stylish qualities, shows plentiful minority culture, features Yi public's approval as well as sensations of varieties. Colors utilized by Yi public have emblematic implications somewhat, which can track down articulation in their exceptional social qualities, tasteful qualities, and creative qualities. Such utilization of varieties assumes an imperative part in the act of ethnic minority tones. In the past two decades, many members of the Yi, or Nuosu, ethnic group have become business owners in Liangshan Prefecture, which is in the mountainous far south of Sichuan Province [3]. These business visionaries work under conditions that contrast fundamentally from those got in China's waterfront regions. The world market, internationalization, and globalization don't yet decide the construction and advancement of business in Liangshan. All things considered, associations with the neighborhood and ethnic local area and to nearby improvement are the critical powers in a business visionary's prosperity. "We operate in a completely different setting here," as stated by one of the entrepreneurs interviewed for this volume. Simply take a gander at crafted by our province government and attempt to grasp it." [4] what's more, Nuosu business visionaries work as per diªerent esteems, and have diªerent objectives and needs, from business visionaries having a place with the Han greater part ethnic gathering in the majority of China. We must first comprehend the society as a whole in order to comprehend the entrepreneurs of Nuosu and their place in the community, including the social and political frameworks in which they operate and the values that guide them [5].

2. Traditional lacquerware craft of Liangshan Yi Nationality:

Peng Yi was born in Guangming Town, Xide County, Sichuan Province in November 1984. From March 2005 to April 2007, under the guidance of Jiwu Wuqie, learning Yi people's lacquer making skills; from May 2007 to May 2012, promoting Yi people's lacquer ware culture in Xide County, and at the same time imparting Yi people's lacquer making skills to the locals Women; Since June 2012, he has independently designed, produced and sold Yi nationality lacquerware in Xichang City [6]. In 2012, under the guidance of the Women's Federation of Liangshan Prefecture and Xide County, the Yi nationality lacquer ware exhibition hall was built, which mainly exhibited some representative Yi nationality lacquer ware works. At the same time, it established a women's practice learning base to provide entrepreneurship and employment practice training for women in the county [7]. Peng Yi followed the Jiwu witch and learned the craftsmanship of Yi people's lacquerware, and also taught this craftsmanship to more people. At present, a total of more than 20 women have learned and mastered Yi people's lacquer making skills, enabling women to start their own businesses, obtain employment and increase their incomes, promote the development of women's careers, and provide a favorable platform for inheritors to carry out skills transfer activities, which is beneficial to protection and development. Yi people's lacquerware culture has made positive contributions [8]. Yi lacquerware is a traditional Chinese minority craft that has been around for a millennium, and it is listed as intangible cultural heritage at the state level. In Chinese lacquerware culture, it is distinctive. Yi people have produced distinctive, vibrant, useful lacquer crafts with black, red, yellow serving as the primary colours in their long-term lifestyle practices (see Figure 1) [9]. This is due to their wisdom and inventiveness.

Figure 1. the Yi people's lacquerware,
http://cul.china.com.cn/2021- 10/22/content_41711412.htm

Aesthetic Styles:

Harmony and proportion of the colours used define the colour style of lacquerware made by the Yi people (see Figure 2). It is simple to observe that many natural objects, including flowers and leaves, have symmetry. A dignity, elegance, and tranquil beauty will be brought about by the harmony and balance of colours. Simultaneously, when it comes to lacquerware colour application, the blending of various colours produces melodic rhythms. Colour rhythms in lacquerware are formed by the density and area in which colours are used, and this allows the colours of Yi lacquerware to exhibit its own creative style [10].

Figure 2.symmetric and balanced colors of lacquerware,
http://www.scpublic.cn/news/wx/detail?newsid=650471

Archaeological Data on Lacquer Art of Liangshan Yi People

The history of Liangshan finish artistry is very long. Earliest lacquerware discovered in Sichuan was discovered in burial chambers of Fighting States period [11], which leads some researchers to conclude that lacquerware is not locally made in Sichuan but rather comes from other parts of the world. In any case, lacquerware discovered at Guanghan site in Sichuan exhibits common characteristics of Sichuan culture, indicating that lacquerware is closely associated with area. General Zhuang Yan of the Chu people drove a party into the Sichuan region during the Fighting States period, and then entered Sichuan through the Sichuan-Chu trade route. Hubei Guanghua's lacquer box contained an inlay comparable to that of Jinning Shizhai Shanxi Han Tomb M23's, which was discovered "with Changsha Chu cultural relics style," according to the archaeological data. This demonstrates Sichuan's involvement in Warring States period as well as strong relationship between Chu State and Sichuan. It also clarifies Sichuan lacquer and suggests that Chu was the likely source of Chu's Sichuan veneer workmanship during the Warring States period [13].

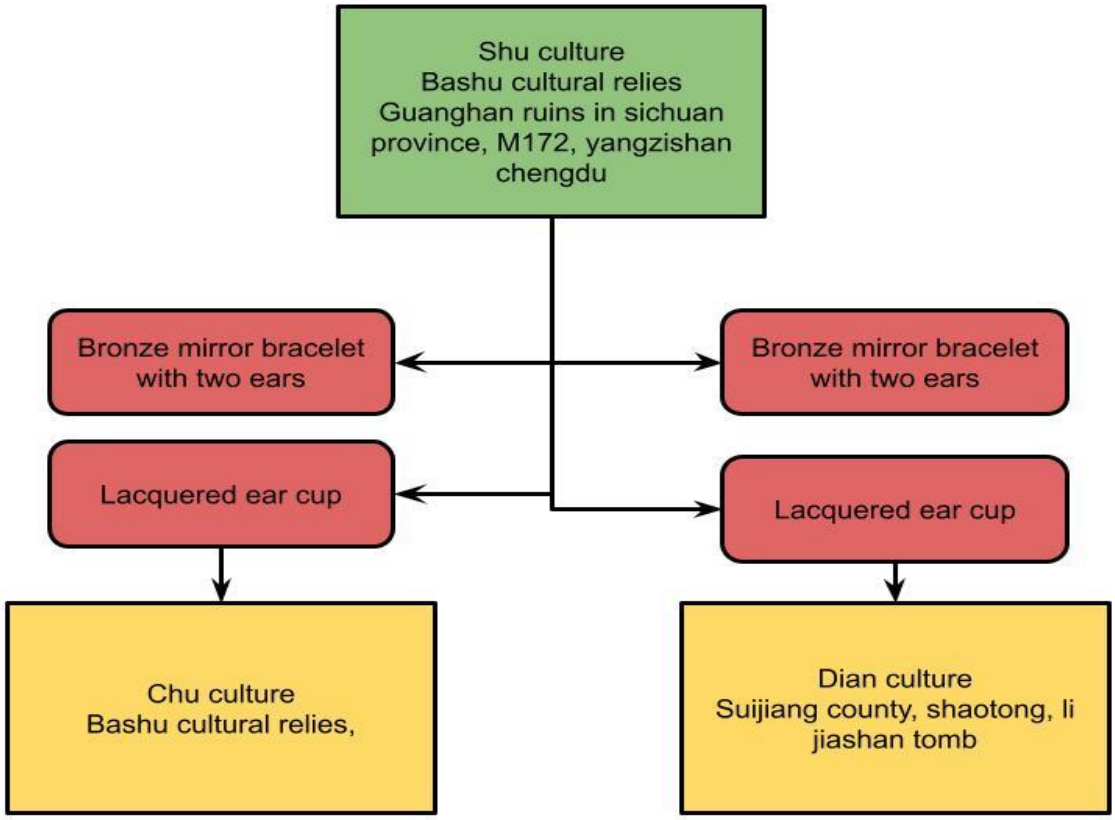


Figure 3. Archaeological data of lacquer art of Yi nationality in Liangshan

Historical data on Lacquer Art of Liangshan Yi People
Figure 4: "Zhuang examination into Shu" shows the genuine information examination of Liangshan Yi veneer workmanship. The science, technology, culture of Sichuan [14]. These historical settings shaped the conditions that led to creation of Liangshan Yi's lacquer art in Sichuan. Liangshan Yi lacquer art fully absorbed the local ethnic cultures of various regions during the long process of a mother's development through mutual influence and promotion. This resulted in a series of distinctive minority lacquer art Yi lacquer, Tibetan lacquer Dai lacquer, Yi lacquer, other ethnic lacquer art [15]. This also clarifies early Liangshan lacquerware found in tombs of Warring States as wekk asSichuan lacquerware unearthed at the Guanghan site that displayed typical Sichuan cultural traits [16].

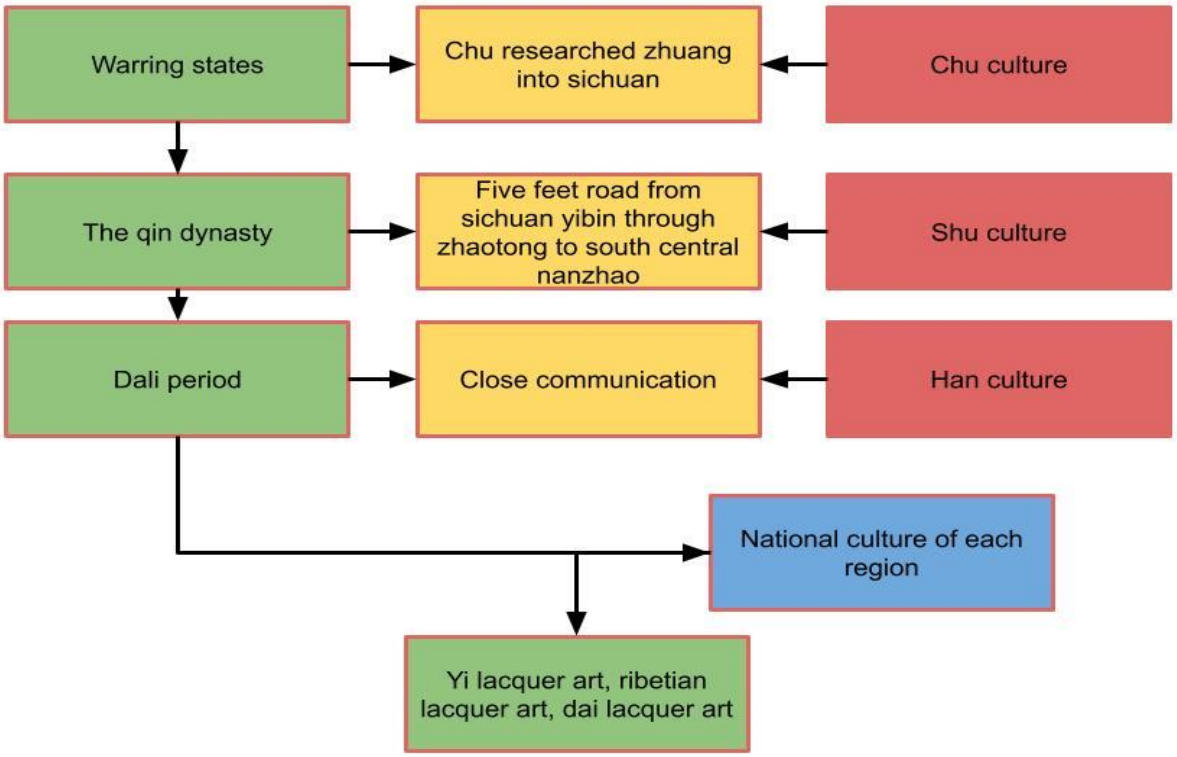


Figure 4. Analysis of historical data of Liangshan Yi lacquer art

Conventional finish craftsmanship of Liangshan Yi identity possesses the main situation in the veneer workmanship culture of Chinese ethnic minorities, it turned into second cluster of public elusive social legacy in 2008 [17]. At first, Liangshan Yi lacquerware served as a useful tool for people's daily life. It has gradually evolved into one of the most representative representations of the Liangshan Yi people following the opening up and transformation, along with the revival of public culture[18].In ongoing years, Yi individuals' lacquerware is not generally utilized as an instrument for everyday use, except more utilized as gifts and traveler creates. Consumption based on use is less than the consumption based on appreciation. Yi veneer product industry has turned into a significant piece of the economy in some Liangshan regions, and has carried great monetary advantages to neighborhood skilled workers. Liangshan's high-quality economic development can be positively impacted by preserving the Yi people's traditional lacquerware culture and expanding industries related to lacquerware. The Torch Festival's expression and cultural activities are exhibiting a diversified trend that blends the public and the government with the passage of time and social progress. The joint advancement progressively epitomizes the pattern of improvement from singleness to completeness, which gives Light Celebration new essentialness as well as people custom capabilities [19].In the setting of the ongoing financial turn of events, the Liangshan Light Celebration is introducing advancement with another look, which has incredibly advanced the overwhelming improvement of Liangshan Prefecture's travel industry, providing food, and convenience businesses, and actually advanced the top notch improvement of the state's economy.
The customary food culture of Liangshan Yi individuals conveys act of Liangshan Yi individuals' reasoning mode, esteem direction, endurance intelligence, and so on. It contains the conciliatory practice of the Yi nation's relatives to regard their precursors, and simultaneously it likewise conveys the soul of friendliness, regard for the old, and love for the kids. Cuisine culture The general public's pleasant, steady, and facilitated growth in Liangshan Yi Locale is positively impacted by the legacy and enhancement of Liangshan Yi Region [20].Liangshan's Yi people are dynamic and progressive. They will give precedence to and treat family and friends with respect when it comes to food and drink when they are visiting. The family still needs to slaughter

and bleed in order to show guests respect, even though they already have an abundance of meat on hand. The Liangshan Yi people have been heavy drinkers from ancient times. Weddings, funerals, religious events, mediation of conflicts, reunions, and departures all require drinks. Simultaneously, wine is additionally a significant vehicle for the Yi nation in Liangshan to determine clashes and questions. At the point when clashes and questions happen between Yi family branches or individual individuals, party who loses steps up to plate and inquire "Degu" to intercede as well as carry wine to apologize [21]. The two players by and large concur. reconciliation. Consequently, wine is a significant connection between Liangshan Yi individuals' feelings, many struggles and questions are phenomenally settled through wine. Advancing as well as acquiring Liangshan Yi individuals' food culture will assist with settling enhanced clashes and debates, and assume a positive part in the great improvement of Liangshan ethnic solidarity [22].

3. Materials and methods:

Data Source and Data Processing

Full-text database of Chinese academic publications, or CNKI, provided the data for this study. The subject words "Yi nationality" and "design" are used to retrieve Chinese literature. There is no time limit on the retrieval of 981 documents from academic journals, dissertations, conferences, newspapers, other sources. 852 genuine documents were collected after removing duplicates, press releases, conference reports, newspapers, government or association project releases, work exhibits. Export the study's target papers in the refworks format from CNKI to the input folder you've previously created. Then, rename the exported file format to download01.txt so CiteSpace software can open it. In order to process the data, CiteSpace 5.8 R3 software was used. Time slices from 1985 to 2022 were set, with one year as the years per slice, top 50 selection criteria, practice using Pathfinder, practice slicing networks, and author, institution, and keyword as the node types. Statistical data and a knowledge graph were then obtained. Every author, organisation, and term found in the literature is represented by a node in the co-occurrence knowledge map. Frequency is indicated by node size. The co-occurrence relationship is represented by the connections between nodes, and the co-occurrence strength is indicated by the thickness of the connections. The transition from purple to yellow denotes the early to recent period of time. The nodes' significance within the network architecture is reflected in their centrality. The co-occurrence network structure's tightness is reflected in the network density.

This study utilized strategies, for example, music hypothesis to direct top to bottom exploration on the gathered sound, video, on location interviews, and different information. It examined the situation with Yi society melodies in Liangshan Prefecture and Chuxiong Prefecture, China, looked at melodic qualities of the tunes. It also used a descriptive method to look at the six chosen songs and compare them in terms of their melody, structure, tonality, rhythm and beat, lyrics, singing characteristics. It also summarized similarities and differences in musical characteristics of Yi folk songs in two places. In Liangshan as well as Chuxiong prefectures, concentrate on analyzed the transmission of Yi society tunes in rudimentary and optional schools and nearby organizations. 16 individuals were addressed, including school pioneers, music educators, understudies. The criteria for selecting informants came from local education departments, school leaders suggested music teachers, students suggested school's student union.

3D convolutional recurrent Bi-LSTM neural networks (3D-CRBi-LSTM):

Convolutional neural networks function exceptionally well when processing massive amounts of images since they are deep feedforward neural networks made up of multi-layer artificial neurons. CNNs are used to automatically learn generic features, in contrast to previous methods that use manually derived features from radiological images. CNNs are trained using a backpropagation algorithm. Typically, they have several convolutional, pooling, and fully connected layers. They may also have additional types of layers or fully connected layers connecting them to the output units.

The result is a modified structure that has had the original structure's centre residue removed. After that, changed structure is subjected to the FEATURE programme, which uses central residue's Cβ atom location to create a feature vector of length 480 that characterises microenvironment. As mentioned in the Atom-Channel Dataset section (A), the resulting training and test datasets are similarly balanced and zeromean normalised. Using a 1:19 ratio, validation examples were selected at random from the balanced training set. Architecture of networks We develop the following two models in order to conduct head-to-head comparisons between ML methods that are constructed on top of traditional hand-engineered features as well as end-to-end trained deep learning frameworks that accept raw input representations: A Deep 3D CNN; B Softmax Classifier with a Feature. Three component models make up each of the models: As illustrated in Fig. 4, there are three stages: (1) Feature Extraction; (2) Data Integration; (3) Classification. We also constructed a third method (C), a Multi-Layer Perceptron with two hidden layers, to compare the benefits of employing a Deep Convolutional Architecture vs a straightforward flat NN.

(A) Deep 3D Convolutional neural network

Methods that make up our deep 3D CNN are as follows: Layers 1–4: Fully Connected Layer, 3D Max Pooling Layer, 3D Convolutional Layer, and Softmax Classifier. In our network, we use three successively alternating layers for 3D max pooling and 3D convolutional layers to extract 3D biochemical information at different

spatial scales. Subsequently, a Softmax classifier layer computes class scores and class probability for each of the 20 amino acid classes, and two fully linked layers integrate data from the pooled response over the whole input box. Below is a quick description of each module's functionality and operation.

3D Convolutional Layer

A collection of learnable 3D filters with modest local receptive fields that cover all input channels make up the 3D Convolution layer. Each filter traverses the input space's width, height, and depth at a set pace during the forward pass. At each location, it convolves with its local receptive field to produce filter responses. To get the activation values, rectified linear (ReLU) activation function applies a series of nonlinear transformations to the filter responses. Formally speaking, Eqs. (1) can be used to determine activation value aL i;j;k at output position (i,j,k) of Lth filter upon convolving with input X.

$$\text{ReLU}\left(\sum_{m=0}^{M-1} W_{m,n} X_m + b_n\right) \quad (1)$$

Our 3D Convolution module convolves it with 3D filters of shape [number of input channels, filter width, filter height, filter depth] with stride 1. The resultant 5Dtensor has the following dimensions: (input depth - filter depth) +1, (input width - filter width) +1, and (input height - filter height) +1]. The 20 amino acid microenvironments are separated by optimising weights of every 3D convolutional filter throughout the training phase to identify local spatial patterns that best capture local biochemical properties. Following training phase, 3D convolution layer's filters will become active when desired features appear in the input at a specific spatial location.

3D Max Pooling Layer

3D max pooling model performs down-sampling of input tensor with a stride of 2, outputs a 5D-tensor of shape, and receives an input 5D-tensor of shape. The max pooling operation divides 2*2*2 cube region into a single 1*1*1 cube with representative maximum value for each channel by determining maximum response value for every 2*2*2 subregion. Equation (3) can be used to explain the operation by eqn (2)

$$MP = X_{ci+1,j+1,k}, X_{cij+1,k+1}, X_{ci+1j,k+1}, \mathrm{X}_{\mathrm{ci+1,j+1,k+1}}\}) \quad \text{Where} \begin{cases} i = l * 2 \\ j = m * 2 \\ k = n * 2 \end{cases} \quad (2)$$

Fully Connected Layer and the Softmax Classifier

Fully-connected layer uses a weight matrix to connect every neuron in one layer to every other neuron in layer below it, integrating information about neurons at every point within a layer. The non-linear transformation is then carried out by a ReLU function. Equation (4) describes the operation. It is possible to integrate pooled filter responses of all filters at every place in protein box by using completely linked layers to follow 3DCNN as well as 3D Max-Pooling layers. The Softmax classifier layer receives the integrated data after which it computes class probabilities as well as the final predictions by eqn (3)

$$h_n = \text{ReLU}\left(\sum_{m=0}^{M-1} W_{m,n} X_m + b_n\right) \quad (3)$$

Fig. 5 displays design overview of our suggested model. "MinMaxScalar" function is first used to preprocess the input data in this case. We may normalise input data in range of 0 to 1 with this function. A sliding window technique is then used to feed the normalised data into a 1D-Convolutional Neural Network (CNN) layer. When extracting features from a fixed-length slice of a bigger dataset—where feature's location is less important—a 1D CNN comes in very handy. In time series analysis, it is helpful. This 1D CNN layer has an activation function called "relu," 64 output filters, a kernel size of 5, and a stride size of 1. After that, CNN layer's output is sent into a Bi-LSTM layer, which combines forward as well as backward propagation using 128 hidden memory units. After that, the Bi-LSTM output is routed through two further LSTM layers and a GRU layer. These levels are composed of 64 hidden memory units each. Output will next be fed into an LSTM layer, which has fifty hidden memory units in it. Eventually, a fully connected NN with one layer will transmit the output.

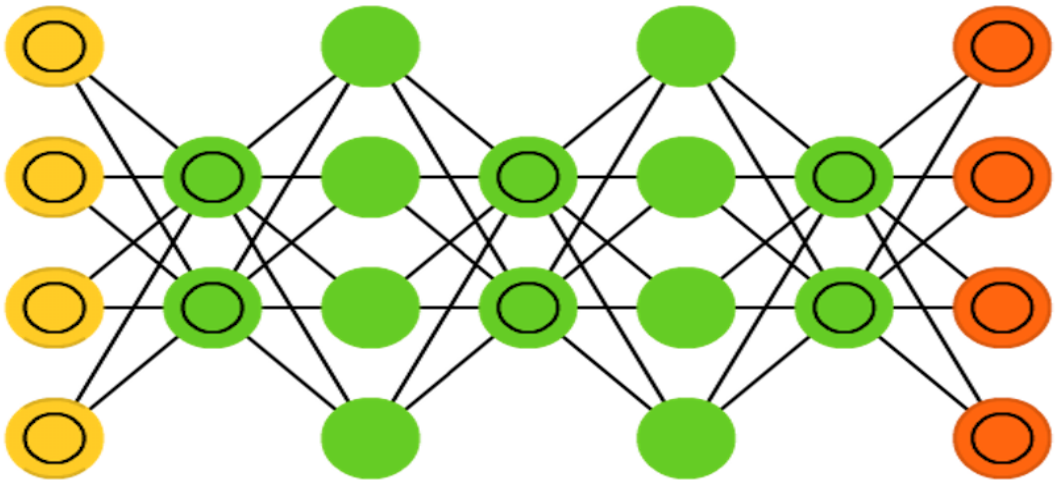


Figure-5 recurrent Bi-LSTM neural networks model

Here, Bi-LSTM updates hidden state in two directions by utilising both forward as well as backward data. Once more, LSTM as well as GRU are two unique RNN variations with fewer parameters than Bi-LSTM. While GRU typically outperforms others in smaller datasets and LSTM typically performs better in larger datasets, a well-balanced mix of both RNN units with more precisely adjusted hyper-parameters produces a superior outcome. Input time series data is divided into a number of fixed-length history sequences, each of which is followed by a correspondingly sized prediction sequence. Forecasting sequences and history are used as inputs and supervised outputs/labels, in suggested architecture.

The number of recurrent units is primary distinction between a recurrent neural network as well as ordinary NN. The weight of hidden layer input at this time is determined by W, which is hidden layer value from previous time. The hidden layer value of the recurrent neural network at time t is not only related to the input at time t, but it is also related to St-1 at the prior time. Recurrent neural network can be expressed mathematically as follows by eqn (4)

$$o_t = g(Vs_t) \tag{4}$$

The activation functions are denoted by g and f, while the output layer's calculation formulas are represented by o_t and the hidden layer's by s_t. If one were to repeatedly replace equation (1) with equation (5), then:

$$\begin{aligned} o_t &= g(Vs_t) \\ &= g\left(Vf\left(Ux_t + Wf(Ux_{t-1} + Ws_{t-2})\right)\right) = g\left(Vf(Ux_t + Ws_{t-1})\right) \\ &\quad g\left(Vf\left(Ux_t + Wf\left(Ux_{t-1} + Wf\left(Ux_{t-2} + Wf(x_{t-3} + \cdots)\right)\right)\right)\right) \end{aligned} \tag{5}$$

An LSTM network is a kind of RNN that preserves benefits of RNN for handling time series data processing in order to integrate the input data from the past with the current calculation. This design facilitates tasks involving sequences. On the other hand, RNNs can only memorise a limited amount of short-term historical input information and are unable to effectively solve issues involving long-term memory, such as gradient disappearance as well as gradient explosion issues. This is the problem that an LSTM solves by combining gate control with both short- and long-term memory.

The long horizontal line in the figure illustrates a standard LSTM model; this hidden state is commonly referred to as cell state, denoted as Ct. The cell state, which runs directly on the entire chain but only completes a limited number of linear interactions, is utilised for information transmission and storage. An LSTM network's essential structure is its cell state. Three gate levels as well as one tanh layer make up four interaction layers of LSTM network topology. Data from previous steps is carried by processor state, a crucial variable in LSTM, which progressively moves across whole LSTM. Input of current step, hidden state and processor state of preceding step, are included in every repeated network.

The four interaction layers' computation results are used to update the processor state. The output is updated processor state as well as concealed state, which move on to the next stage. Forget gate (zf), input gate (zi), and output gate (zo) are the three gates that make up the four interaction levels. Every gate consists of a dot product operation and a sigmoid function, forming a selective structure. The sigmoid function's output value falls between 0 and 1, where 1 indicates that the output is kept and 0 indicates that it is discarded. Input weights W, recurrent weights R, bias b are defined by LSTM cell structure. The following represents matrices W, R, and b by eqn (6)

$$W = \begin{bmatrix} W_{\mathrm{i}} \\ W_{\mathrm{f}} \\ W_g \\ W_o \end{bmatrix} R = \begin{bmatrix} R_{\mathrm{i}} \\ R_{\mathrm{f}} \\ R_g \\ R_o \end{bmatrix} b = \begin{bmatrix} b_i \\ b_{\mathrm{f}} \\ b_g \\ b_o \end{bmatrix} \tag{6}$$

where input, forget, layer, input, output gates are represented by the letters i, f, g, and o, in that order. Hidden state ht−1 of the preceding sequence as well as sequence data xt are combined with an activation function—typically a sigmoid function—to yield forget gate's output, zf. Output in this case shows likelihood of forgetting hidden cell state of preceding layer because sigmoid function's output falls within in0terval [0,1]. The expression in mathematics is by eqn (7)

$$z' = \sigma(W_i x^t + R_i h^{l-1} + b_i) \tag{7}$$

Whereas the sigmoid function is characterised by σ. The input gate is divided into two sections: sigmoid section utilises activation function with zi as the output, and the tanh section uses zg as the output. The cell status is then updated when these two portions' results are multiplied. The expression in mathematics is by eqn (8)

$$\begin{aligned} z' &= \sigma(W_i x^t + R_i h^{l-1} + b_i) \\ z^g &= \tanh\left(W_g x^t + R_g h^{t-1} + b_g\right) \\ C_t &= z^f \odot C_{t-1} + z^i \odot z^g \end{aligned} \tag{8}$$

where activation zo is calculated, hidden layer state ht is attained, where Ct is the unit state and ⊙is the Hadamard product. The expression in mathematics is by eqn (9)

$$\begin{aligned} z^o &= \sigma(W_o x^t + R_o h^{t-1} + b_o) \\ h^t &= z^\rho \odot \tanh\,(C_t) \end{aligned} \tag{9}$$

Ultimately, we can extract hidden layer state sequence of same length as input sample sequence at each timestep as well as adjust final output result based on output sample's dimensions.

4. Results and discussion:

Way to building a profound brain network is deciding organization boundaries. Outcomes of the calculations are significantly influenced by the parameters chosen for the network. It is essential to construct the network model that is most suitable when confronted with various methods and problems. As of now, not many examinations have acted top to bottom investigation and exploration on the topological design of well logging translation, for the most part utilized the immediate task strategy or called a current organization structure model, which prompts degeneration of the steadiness, exactness and speculation capacity of the profound brain network model. We need to use a model with special physical meaning in order to solve the logging interpretation issues that arise during reservoir evaluation; in any case, this makes it challenging to augment the job of profound realizing while straightforwardly calling profound learning calculations. The LSTM network has not yet been used to classify reservoirs; Joined with the distinction and qualities of our concern, we completed change tests for the LSTM hyperparameters and design. To further develop the speculation capacity of the organization and keep away from overfitting, we utilize cross-approval, a sum of 800 arrangements of preparing information are haphazardly chosen from 5180 arrangements of information framed in 3 demonstrating wells as the confirmation informational collection, while the excess 4380 arrangements of information comprise the preparation informational collection. To completely guarantee that the attributes of the preparation informational collection and the check informational index are predictable and that the impact of the model can be completely confirmed, after arbitrary testing, measurable examination is performed on the logging bend dissemination of the whole informational collection and the confirmation informational collection to find every one of the two informational indexes. The logging bend dissemination is predictable with one example following an ordinary circulation and is set as the last preparation informational index and confirmation informational index. By contrasting the exactness and misfortune upsides of the check informational index while changing the boundaries, we concentrate on the determination of Bi-LSTM network boundaries as well as proper design of organization. Cross-entropy loss is utilized in the loss function. Moreover, for ordinary arrangement organizations, the order layer should follow softmax layer; in grouping layer, preparation network takes qualities from softmax capability and doles out every contribution to one of K fundamentally unrelated classes involving cross-entropy capability for a 1-of-k coding plan by eqn (10)

$$\text{loss} = -\sum_{i=1}^{N}\sum_{j=1}^{k} t_{ij} \ln y_{ij} \quad (10)$$

In specifically, 1. learning rate η, 2. number of brain network layers L, 3. number of neurons in every secret layer j, 4. parameter for regularisation of dropouts, minbatchsize are included in change try for Bi-LSTM network. We adopt crossover strategy at a specified number of steps with a specific step size for learning rate, dropout regularisation border, minbatchsize of a small clump of information among the five hyperparameters. Layer-by-layer determination approach is used to find number of hidden layers as well as hidden layer neurons in relation to the total number of network layers as well as neurons.

Yi Enamel Workmanship Picture Securing There are numerous sorts of Yi veneer craftsmanship pictures, and prior to building the picture information base of Yi polish craftsmanship, Yi finish craftsmanship will be efficiently arranged, and examples and shades of Yi veneer workmanship will be gathered for clients' reference and speedy recovery. Pattern and motif extraction is necessary for database construction preparation. Grayscaling the color image yields the bitmap immediately, and mapping software is used to convert it into a vector image using batch extraction of patterns with goal of maintaining integrity of pattern resources when they are later stored in database. Collection process is depicted in Fig. 6.

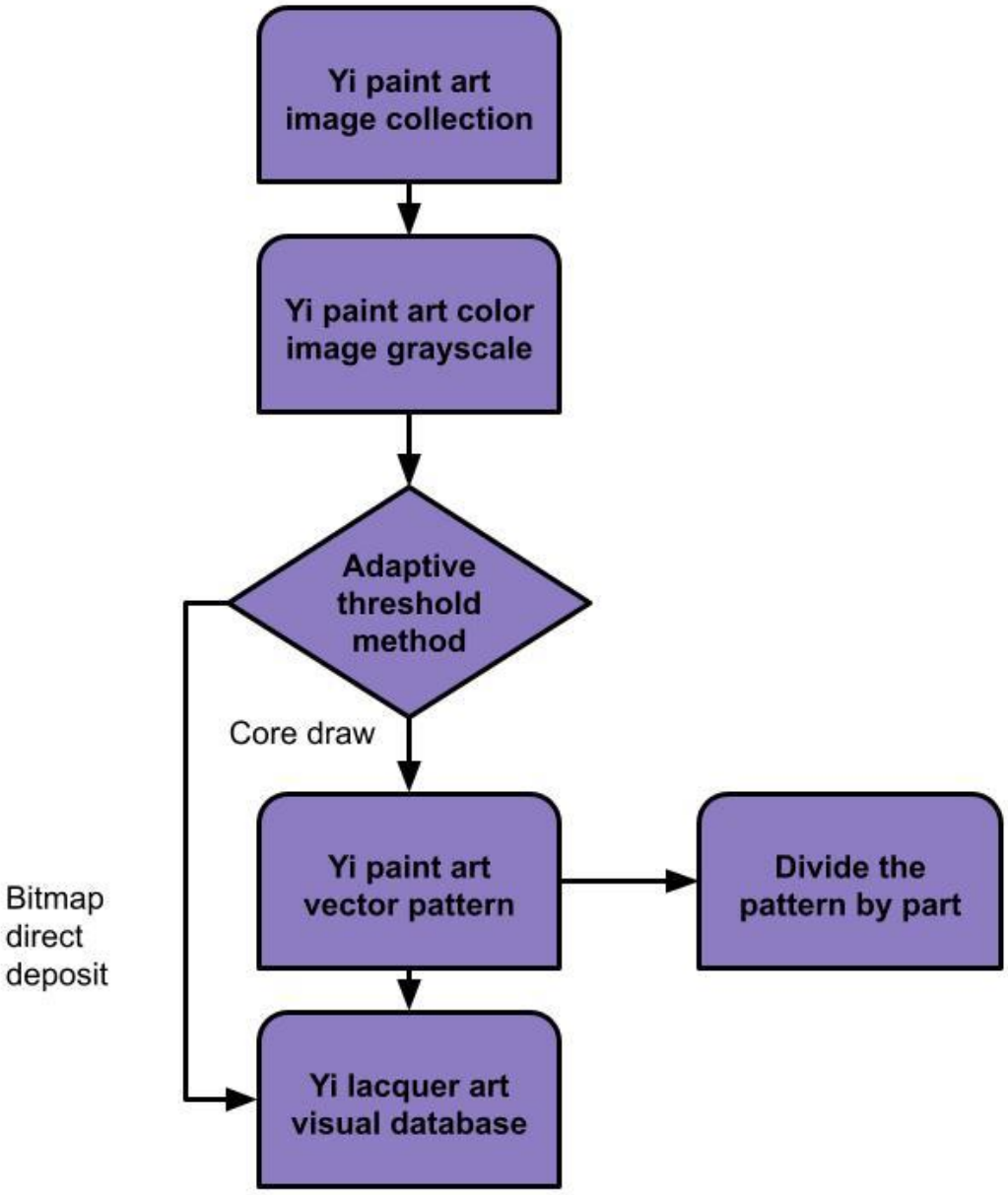
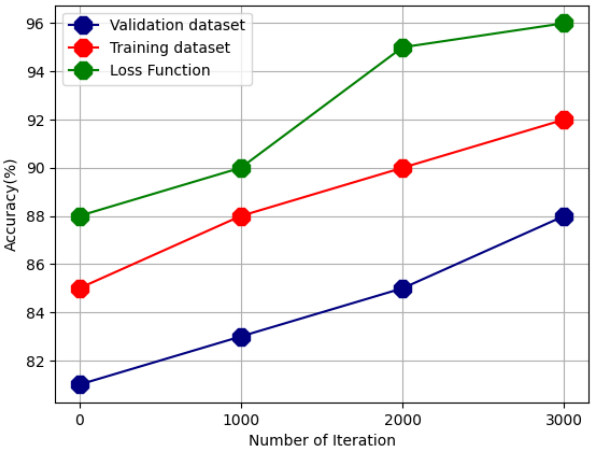


Figure 6. Integrity collection process of Yi nationality lacquer art pattern resources

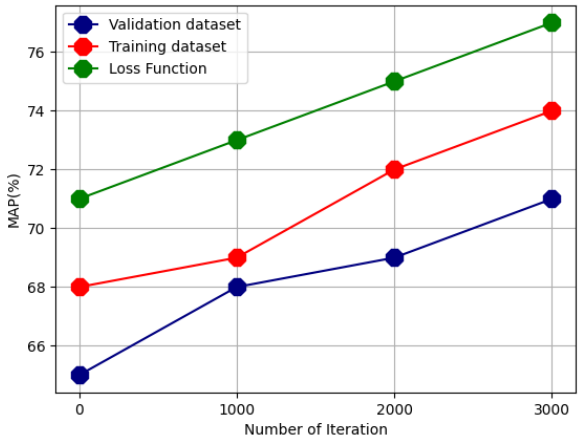
Values of various parameters of Bi-LSTM network are displayed in Table 1. Ranges for learning rate as well as dynamic learning rate, dropout setting, minbatchsize, and number of hidden layer neurons are [50-200], [0-0.9], and [1-6], respectively. The range for the hidden layer neurons is 550, 1095, 2190, and 4380.

Table 1. Bi-LSTM network training specifiactions

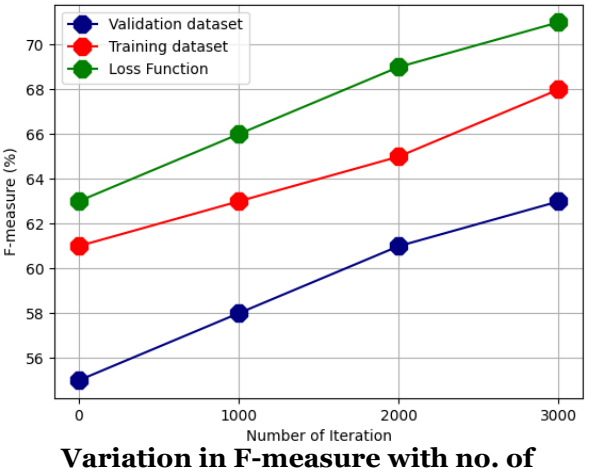
Parameters	Values
Leaming rate	0.1,0.01,0.001, dynamic parameter
hidden size	50,80,100,120,150,200
Minbatchsize	550,1095,2190,4380
Dropout	0,0.1,0.2,0.3,0.4,0.5,0.6,0.7,0.8,0.9
layers	1,2,3,4,5,6



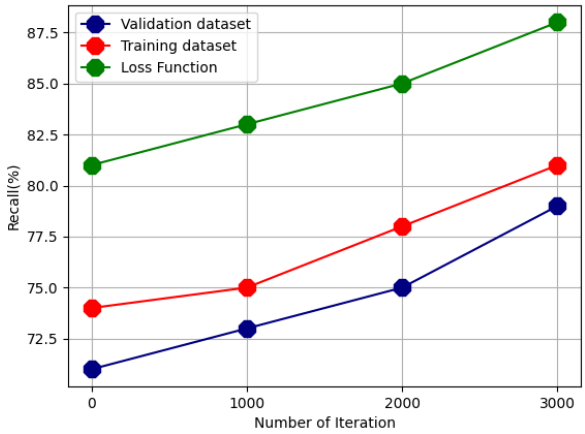
Variation in accuracy with no. of iteration



Variation in mean average precision with no. of iteration



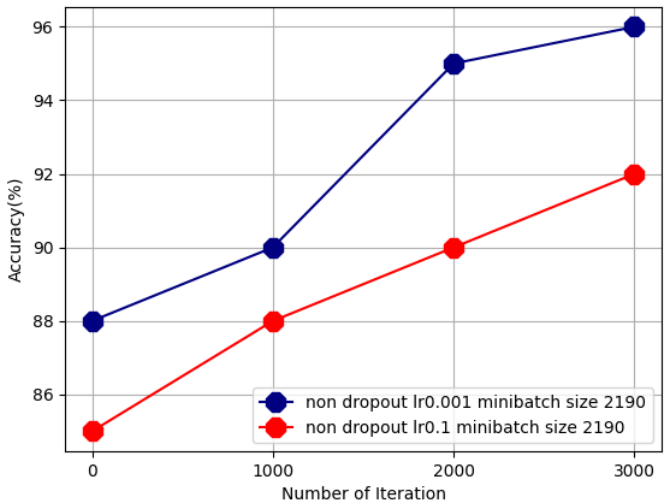
Variation in F-measure with no. of iteration



Variation in recall with no. of iteration

Figure 7. Optimal minbatchsize simulation results

In order to model impact of various minbatchsize values on performance of Bi-LSTM network, we configured network with one hidden layer, one hundred hidden layer neurons, no dropout, learning rate of 0.01. Final result is best of ten random simulations of each scenario, using minbatchsize values of 550, 1095, 2190, and 4380. Figure. Figure 7 displays the best simulation outcomes for the minbatchsize parameter. Method converges after a minimum number of iterations when minbatchsize is 2109, validation set's accuracy is 83.6013%, which is superior to network's performance under other circumstances, according to the exactness and unfortunate upsides of approval set in Figs. 7(a) and 7(b). That is, size of the informative index, which depends on methods accuracy as well as generalizability, used to determine minbatchsize, or point at which PC execution is sufficient to execute profound learning method. When minbatchsize is changed to a different number, the discrimination accuracy is better for the training data set when it is 2190 (Figs. 7(c) and 7(d)).



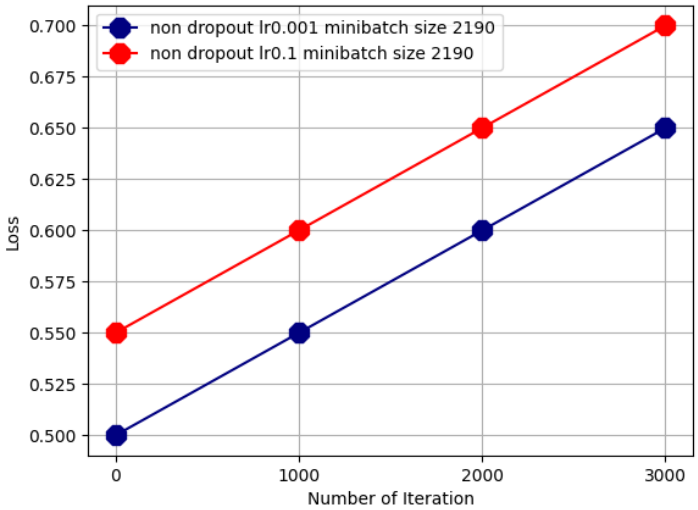


Figure 8. Optimal lr simulation results.

Once the optimal value for minbatchsize has been determined, we employ a training simulation to find optimal value for learning rate, an essential hyperparameter. This time, we configured basic architecture of system to consist of one single secret layer, one hundred secret layer neurons, no dropout, and a minimum batch size of 2190. Ten reenactments are run at various learning rates. Fig. 8(a) and 8(b) show the ideal outcomes of the verification set's accuracy and loss values under different circumstances. When network training speed is too rapid and learning rate is too high, network jitter gets worse and stability worsens. Method exhibits a long combination speed, learning rate is too low, enhancement speed is prematurely delayed in initial phase. As a result, we adopt a unique learning rate as well as use a higher learning rate in initial stages of organisation preparation, keeping in mind impact of learning rate on organisation. Later on, method converges, learning rate is lowered to more effectively integrate model. Yi polish craftsmanship photos' information base foundation is accepted by both the front-end and the back-end. Data model of welcome page comprises five sections: landing page, design assets, social and inventive focus, creative process, and distinct portions. Clients enter the secret word to access the point of interaction of the welcome page. The introduction to Yi polish craftsmanship, the evolution of Yi veneer craftsmanship, the biographies of experts, and the most recent information as the exposure of Yi finish craftsmanship images are all presented on the main page. Design Assets offers clients a variety of goods, including line drawings, individual components, pastels of Yi final handiwork photographs, unique works that can be downloaded and viewed based on their needs. The Social and Innovative Centre combines social and creative expression with creative tendencies. The Yi veneer craftsmanship development cycle as well as types of materials utilized in Yi finish craftsmanship are presented in the category of craftsmanship. The executives and asset sharing are the subject of the other focus, wherein asset sharing provides clients with easy access to books and written content about the pony spoon. The Yi lacquer art image database has functional modules that are conceptually related to one another, compliment each other, and allow for easy switching between them. To facilitate the maintenance of Yi lacquer art image data, a background management module is developed concurrently. In order to guarantee that resources are continuously increased, the administrator has the ability to amend and modify the database's material as well as add information from the most recent Yi lacquer art image collection.

5. Conclusion:

Liangshan Yi's lacquer decorative art is a significant component of Yi traditional culture. It is connected to Yi religious art, architectural art, dress art is rooted in rich soil of Yi traditional culture. In a nutshell, in age of Internet, traditional Yi lacquer art's economic growth and visual communication must be constantly promoted through the Internet's carrier advantage and the development of an adaptive threshold-based method for visual communication. Ancient Yi folk songs' lyrics and composition were written by Yi people themselves, they accurately depict their production, life, and emotional memories. The creator's name was originally on the Yi songs, but basic information is difficult to verify due to the long history. Yi folk songs are not distinct works but rather a collection of their own creations from a specific time period. Yi people melodies are composed by singers who likewise act as inheritors. With its free as well as joined style, rich philosophical ramifications, and solid ethnic attributes, variety culture has shown unmistakable, profound, and beguiling ethnic practices and the visual culture, turning into a basic piece of the Yi public's way of life. Fixating on variety culture of Yi public as well as their stylish thoughts, this paper examines shades of Yi nation from its variety culture as well as highlights of varieties, deciphers Yi nation's tasteful thoughts from their outfits, lacquerware, dance sonnet. It is seen that as not quite same as other ethnic gatherings, Yi public have their unmistakable veneration for tones and stylish thoughts. The creator trusts that more individuals can see the value in that Yi

public have a rich and shifted beautiful culture as well as tasteful thoughts, which is helpful for gaining from ethnic minority's way of life, conveying forward pith of Yi public's variety culture as well as applying it to each viewpoint.

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