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# Evaluating culture and arts from an economic point of view: calculation of the cultural GDP of Kyoto Prefecture in 2015

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## Abstract

This paper aims to evaluate the culture and arts of Kyoto Prefecture through the calculation of its cultural GDP in 2015. The method for calculating the cultural GDP in Japan is mainly based on the criterion of the UNESCO Culture Satellite Account (CSA). Results reveal that the ratio of the cultural GDP to the total GDP in Kyoto Prefecture (about 2.0%) is slightly higher than that of the whole country in Japan (about 1.8%) and each domain shows different characteristics from the national situation. Considering the growth strategies of cultural industries formulated by Japanese government, Kyoto Prefecture should focus on developing its competitive tertiary industry and vigorously promote its cultural industries as well as activate the development of the traditional culture.

**Keywords:** Cultural GDP, Kyoto Prefecture, Culture and arts

## 1 Introduction

According to most criteria, culture and arts consist of a large range of economic activities. However, it is difficult to define the boundaries among the cultural industries in the context of economic theory. Among the phenomena that have attracted the attention of contemporary economists, production and consumption of culture and arts have been one of the longest as part of human activity. However, it is only recently that serious work has begun to be undertaken in this field known as “cultural economics” (Throsby 1994).

Nevertheless, estimation of the value added of those economic activities of culture and arts is not only important, but inherently useful for cultural economics although the effect of the production of cultural industries on multiple domains of daily life is always neglected. Ideally, analysis of the value added will capture the benefits associated with the role of culture and arts in enhancing civic engagement, health and educational outcomes, creativity and innovation and a variety of other social benefits (NEA 2011). Therefore, it is of great significance to define the scope of culture and arts from the perspective of economics to evaluate the economic contribution of culture and arts. Considering that there has been no universal standard in the definition and scope of

quantitative evaluation of culture and arts, research should start with methods to evaluate the economic contributions and narrow the framework centered on culture and arts.

There are various methods to evaluate the economic activities, among which calculating the GDP of them may be a relatively intuitive way. GDP, an economic term (Seyed et al 2017) that plays a significant role in macroeconomics, refers to the market value of the goods and services produced within the geographic boundaries of a country during a specified period of time (normally a year). It is widely used as the primary indicator to evaluate output and economic activities. Cultural GDP, as part of GDP, is the added value created by cultural activities. Though the value created due to cultural activities is diverse, including non-monetary and non-market types, the only economic value captured in the GDP framework is cultural GDP. Therefore, cultural GDP is the amount included in the existing GDP framework. It should be noted that cultural GDP does not seek to add new value to cultural activities and cultural creative activities (ACA 2019).

In recent years, many western countries have been placing great emphasis on culture and arts and treating their development as one of the development strategies. Japan has followed closely and has been making great efforts in developing its cultural industries. Additionally, the enforcement of the *Basic Act on the Promotion of Culture and the Arts* (ACA 2017a, b, c) provides an opportunity to evaluate the culture and arts of Japan economically. Japanese agency for cultural affairs also established an investigative research committee to calculate the cultural GDP (Fujikawa and Kawamura 2021).

Cultural GDP is a metric designed to quantify the economic value of a country’s cultural industry. Such an indicator would need to be carefully designed to capture the richness and diversity of cultural expressions and their contributions to the economy. The cultural GDP might exhibit some potential characteristics like a broad scope, direct and indirect contributions and accessibility. Crafting the cultural GDP would be a complex endeavor, given the diverse and multifaced nature of cultural outputs and their impacts. Many countries and regions around the world have published their cultural GDP as shown in Table 1 and they can mainly be divided into two groups. One is a group that uses UNESCO’s handbook to calculate the cultural GDP such as some European countries, North America and Japan. The other one is a CAB group, called Convenio Andrés Bello, which is centered on some Latin American countries such as Mexico, Colombia, and Chile. It is an international inter-governmental organization working in Colombia and several other Hispanic countries, which developed a methodology

**Table 1** The cultural GDP of each country

Country	Cultural GDP (100 million \$)	The proportion of domestic GDP (%)	Object year
USA	8778	4.50	2017
Japan	951	1.90	2018
Germany	851	3.00	2018
Canada	726	2.70	2018
UK	572	4.00	2018
France	398	2.30	2018
Australia	282	3.60	2017

Source adapted from Fujikawa and Kawamura (2021)

for the implementation of a cultural satellite account. The UNESCO's method to estimate cultural GDP is used more widely due to the integrated criterion meeting with the characteristics the cultural GDP should have. In this paper, the method for calculating the cultural GDP is based on the UNESCO's criterion because this method allows for a meaning comparison of the cultural activity of Kyoto Prefecture with the domestic result estimated by Fujikawa and Kawamura (2021) which employed the same method in the same year of 2015. Thus, we can not only grasp the cultural value at the national level but also facilitates the estimation of detailed regions and areas for a deeper understanding. The detailed calculations are described in Sect. 4.

Many reports on Japan's national cultural GDP have been published since the *Cultural Economic Strategies (Bunka Keizai Senryaku in Japanese)* was unveiled in 2017. However, very few studies were conducted on the cultural GDP of typical local regions in the country. This is mainly due to the difficulty in measuring the economic effects of culture and arts in these local regions and making comparisons. Most related research are on Tokyo, which is the biggest urban area in Japan, while the research on the western areas in Japan are very scarce. There are several urban areas in Kansai region of Japan which have advanced cultural industries like Kyoto Prefecture. As the ancient capital of Japan, Kyoto Prefecture is famous for its traditional culture and has actively promoted the development of its cultural industries in recent years. This paper intends to calculate the cultural GDP of Kyoto Prefecture, which is the representative region in terms of culture and economy in Kansai region of Japan, to make a quantitative evaluation of its culture and arts.

## 2 Literature review

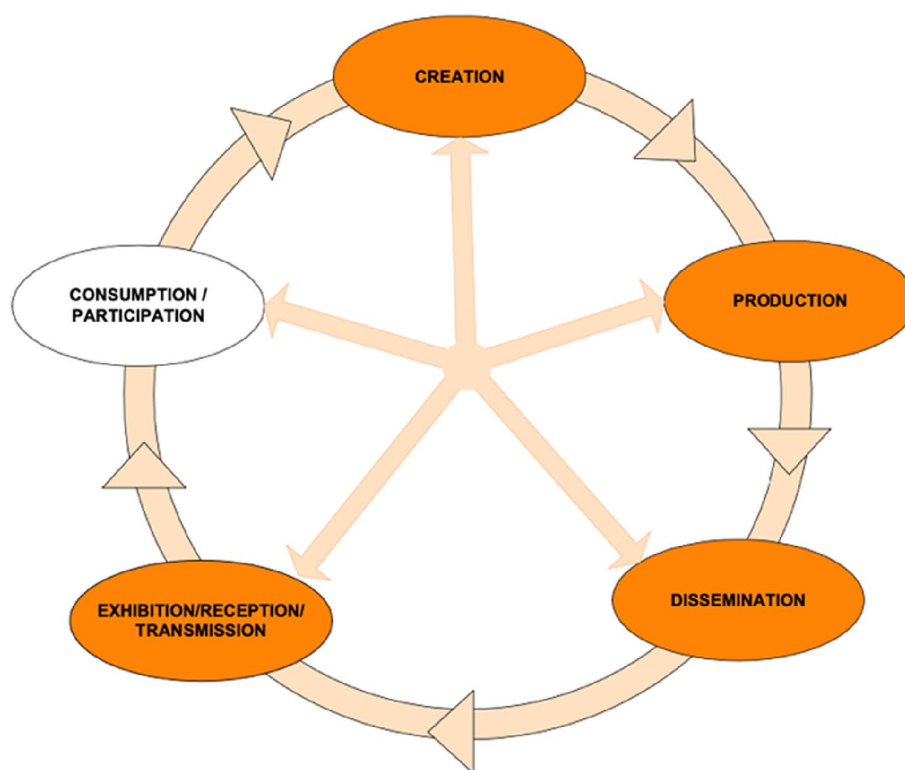
Culture is the heart of a knowledge-based economy (ECP 2006). Estimation of a knowledge-based economy has been one of the international trends criticized by the System of National Accounts, or SNA for short (Yamagishi 2017). The Satellite Account System (SAS), an extension of the SNA, is a robust statistical framework for measuring the economic contribution of some special industries (e.g., cultural and tourism industries, etc.) that do not correspond to a specific statistically delineated economic activities. Therefore, it is usually not observable in the traditional SNA. Cultural Satellite Accounts (CSA) are a statistical framework for measuring the economic contribution of culture. An important characteristic of the CSA is its ability to systematize a large amount of statistical data. However, because it depends on national circumstances, currently there is no official manual on the CSA at an international level. During the development of the CSA, many elements need to be defined, including the definition of culture, key activities and corresponding products. Besides, the number of industries and products depends on the industry development and its diversity in certain fields (UNESCO 2009a, b).

Many Western countries already published their CSA and Japan is currently the only Asian country that has. From Japan's perspective, independent domains are required. For example, according to UNESCO's criterion, "Crafts" refers to some jewelry-related products, but in Japanese sense, the category of crafts is broader than this, including handmade Japanese paper, ceramic ornaments, etc. One reason for this is that intangible culture and life culture are basically not included in the CSA framework. The other reason is that the identification of key sectors depends on local

circumstances. However, independent domains cannot be compared internationally, which may be an issue for future improvements of the CSA (ACA 2019). Hence, in this study around Kyoto Prefecture, the Traditional Textile is added as one independent subdomains under Domain C after investigating the culture and history of Kyoto Prefecture.

The Framework for Cultural Statistics (FCS) (UNESCO 2009a, b), which will be elaborated in the next section, provides CSAs with hitherto relatively standard classifications and definitions. For countries that have been committed to the development of their cultural industries, the FCS is a bedrock to facilitate the evidence-based policy for culture and arts. On the one hand, the FCS has made clear of the main objects of cultural statistics in both main domains and related domains. Moreover, it has clarified which process the estimation of cultural activities is associated with by illustrating the concept of the culture circle as shown in Fig. 1. The culture cycle includes five phases, which are presented slightly differently in a cyclical instead of a hierarchical model to reinforce the idea that the relationships can be complex and occur more as a network. The five phases are explained in 2009 FCS as following:

1. **Creation:** The originating and authoring of ideas and content (e.g., sculptors, writers, design companies) and the making of one-off production (e.g., crafts, fine arts).
2. **Production:** The reproducible cultural forms (e.g., TV programs), as well as the specialist tools, infrastructure and processes used in their realization (e.g., the production of musical instruments, the printing of newspapers).



**Fig. 1** Culture circle. Source: UNESCO (2009a, b)

3. **Dissemination:** The bringing of generally mass-produced cultural products to consumers and exhibitors (e.g., the wholesale, retail and rental of recorded music and computer games, and film distribution). With digital distribution, some goods and services go directly from the creator to the consumer.
4. **Exhibition/reception/transmission:** Refers to the place of consumption and to the provision of live and/or unmediated cultural experiences to audiences by granting or selling access to consume/participate in time-based cultural activities (e.g., festival organization and production, opera houses, theaters and museums). Transmission relates to the transfer of knowledge and skills that may not involve any commercial transaction and which often occurs in informal settings. It includes the transmitting of intangible cultural heritage from generation to generation.
5. **Consumption/participation:** The activities of audiences and participants in consuming cultural products and taking part in cultural activities and experiences (e.g., book reading, dancing, participating in carnivals, listening to radio and visiting galleries).

On the other hand, the FCS has defined the cultural activities included in each domain in accordance with the sector codes in the International Standard Industrial Classification (ISIC), which is essential to the implementation feasibility and comparison at an international level (Nagasawa 2014).

The FCS is more like a guideline rather than a rule for the CSA, because it is flexible in the context of its estimated object. At present, those countries reporting their cultural GDP are still at an early stage to calculate it based on the CSA framework. This is not the completion of the CSA and the aim of the CSA should form a complete system of accounts including the statistics which are beneficial to policymaking (ACA 2019).

Besides, the classification and scope of fixed assets were modified in 2008 SNA. More and more originals of the production of the intellectual property have been measured as fixed assets rather than production activities in the production circle. But the biggest problem is that there is no international guideline for basic statistics of original works. In Japan, the *Survey of Selected Service Industries* (METI 2008) has been updated to accumulate its underlying data. There are several problems with the feasibility of implementation. Therefore, the capitalization of the originals of intellectual property remains a difficult task (Yamagishi 2017).

### 3 Scope of culture and arts in the UNESCO's criterion

It is necessary to define the scope of culture and arts before calculating the cultural GDP. As shown in Table 2, in the FCS, the core domains of the cultural industry include Culture Heritage/Nature Heritage, Performance/Celebration, Visual Arts/Crafts, Books/Press, Audio-Visual/Interactive Media and Design/Creative Services. The bottom of the table shows the related domains including tourism and sports/recreation.

According to the FCS of the UNESCO, the main cultural domains are defined as follows:

#### 3.1 A. Cultural Heritage/Nature Heritage

This domain includes museums, archeological and historical places (including archeological sites and buildings), cultural landscapes and natural heritage. Activities related to cultural

**Table 2** Framework for the cultural Statistics Domains (UNESCO 2009a, b)

	Fields of cultural industry	Subfields of cultural industry
Cultural domains	A. Culture Heritage/Nature Heritage	Museums(also visual) Archeological and Historical Places Cultural Landscapes Natural Heritage
	B. Performance/Celebration	Performing Arts Music Festivals/Fairs/Feasts
	C. Visual Arts/Crafts	Fine Arts Photography Crafts
	D. Books/Press	Books Newspaper and Magazine Other printed matter Library(also visual) Book Fairs
	E. Audio-Visual/Interactive Media	Film/Video Television/Radio(also internet live streaming) Internet Podcasting Video Games(also online)
	F. Design/ Creative Services	Fashion Design Graphic Design Interior Design Landscape Design Architectural Services Advertising Services
Related domains	G. Tourism	
	H. Sports/Recreation	

Source from UNESCO (2009a, b)

and natural heritage encompass the management of sites and collections that have historic, esthetic, scientific, environmental and social significance. Preservation and archiving activities undertaken in museums and libraries are also considered as part of this category.

### 3.2 B. Performance/Celebration

The performance/celebration domain includes all types of live cultural events. Performing Arts includes both professional and amateur activities, such as theater, dances, opera and puppetry. It also includes celebrations of cultural events – Festivals, Feasts and Fairs – that occur locally and can be informal in nature. Music is fully defined in this domain, regardless of formats. As such, it includes live and recorded musical performances, music composition, music recordings, digital music (including music downloads and uploads) and musical instruments.

### 3.3 C. Visual Arts/Crafts

The Visual Arts/Crafts domain includes Fine Arts (Paintings, drawings, sculpture), Crafts and Photography. Commercial places where objects are exhibited, such as commercial art galleries, are also included in this domain.

Many crafts products are produced industrially. Nevertheless, the FCS considers the products, which have traditional characteristics (patterns, designs, technologies or materials) as part of the FCS. Contemporary crafts are not included in Visual Arts and Crafts, but are included in Domain F of Design/Creative Services. It should be noted that the scope of Japanese crafts is considered to be larger by Japanese. Therefore, the calculation of crafts in this paper is based on the calculation of domestic cultural GDP of Japan, taking into account handmade Japanese paper, ceramic ornaments, cloisonne products, artificial jewels, metal sculpture, precious metal jewelry, natural and cultured pear jewelry.

#### **3.4 D. Books/Press**

This domain represents publications in various formats including Books, Newspapers and Periodicals. The newest criterion of the FCS also includes electronic or virtual formats of publications such as online newspapers, e-books and digital distribution of books and press materials. Physical and virtual libraries and Book fairs are included in this domain.

Printing is not normally included in cultural classifications or in definitions of cultural industries. It is not a cultural activity either. However, according to the production phase included in Fig. 1 Culture Circle, printing is part of the production function of the publishing industry. In this way, the FCS includes printing activities with major cultural end uses.

#### **3.5 E. Audio-Visual/Interactive Media**

The core elements of this domain are Radio/Television broadcasting including Internet live streaming, Film and Video and Interactive Media. Interactive Media cover video games and new forms of cultural expressions primarily through the web or computers. It includes online games and websites for activities, which relate to social media networks (e.g., Facebook) and Internet podcasting (e.g., YouTube). However, Internet software and computers are considered to be infrastructure or tools for producing interactive media contents and should be included in the transversal domain Equipment and Supporting Materials.

Interactive media and software are important fields of activities. While many interactive media products and services have cultural end uses (computer and video games, interactive web and mobile content), this is not the case for the software industry. Therefore, Interactive Media is considered by the FCS to be part of the Audio-Visual and Interactive Media domain.

#### **3.6 F. Design/Creative Services**

This domain covers activities, goods and services resulting from creative, artistic and esthetic design of objects, buildings and landscape, which were not included in the 1986 FCS criterion.

This field includes Fashion, Graphic and Interior Design, Landscape Design, Architectural and Advertising Services. Architectural and Advertising Services are part of the core cultural domains, but only as services. To avoid double counting, decisions are made to categorize some design activities into other categories instead of Domain F. For instance,

all buildings that are part of heritage are already considered in Domain A while interactive design media contents are included in Domain E.

### 3.7 Related domains

Sports and Recreation and Tourism are not always considered as cultural activities. However, they do contain cultural elements. In other words, they represent activities that may have a cultural character, but their main component is not cultural. As such, they exist in the FCS as Related domains (UNESCO 2009a, b).

## 4 Methodology

The procedure to calculate the cultural GDP is composed of the conceptual work and the technical work. In the conceptual work, the scope of culture and arts are defined as described before while in the technical work, the cultural GDP is calculated as follows:

There are two methods to calculate the cultural GDP of each domain in the FCS, which are based on the output and the expense, respectively.

### 4.1 Output-based method

As explained before, the cultural GDP in this paper is treated as the value added produced by each cultural industry sector. Hence, the basic equation to calculate the cultural GDP is expressed as follows:

$$\text{Cultural GDP} = \text{the output (from statistical data in each sector)} \times \text{the value added rate (from IO table)}.$$

However, different from the procedure to calculate the national cultural GDP in Japan, some statistics of the output of cultural sectors in Kyoto Prefecture are difficult to obtain directly from the prefectural census. Therefore, in Kyoto, there is one more procedure to calculate its output from the data of the whole country. It is calculated based on the rate of employee or establishment numbers of Kyoto and Japan in general.

The procedure to calculate Kyoto’s cultural GDP is shown in Table 3. Firstly, the output of sectors corresponding to Japan’s national cultural GDP can be counted by the official reports or census data. Secondly, the rate of employee or establishment numbers between Kyoto and Japan in the same cultural sector is used to multiply the national output in order to estimate the output of Kyoto’s cultural sectors. Thirdly, the cultural

**Table 3** Procedure to calculate Kyoto Prefecture’s cultural GDP

	Procedure	Detail	Mark
1	The calculation of output in cultural sector of Japan	Count the census data and make the result as the output of sector i of Japan	$X(i)t$
2	The calculation of output in cultural sector of Kyoto	Use the rate of Kyoto and Japan to calculate Kyoto’s output	$X(i)k = X(i)t \cdot r$
3	Matching in IO table	Match the cultural industry sector i with its superior sector j (contain sector i) in IO table	statistics sector i IO table sector j
4	The calculation of value added rate	Calculate the value added rate of sector j in IO table	$v(j)$
5	The calculation of cultural GDP	The output multiplies value added rate	$GDP(i)k = X(i)k \cdot v(j)$

Source adapted from Fujikawa and Kawamura (2021)



sectors are matched with their superior sectors and include them in the superior classifications in the Input–Output (IO) table as shown in Table 4. Thus their value added rate can be determined. However, the value added rate of consumption expenditure outside households is included in the IO table, but not included in the calculation of the SNA. Therefore, the calculation of the value added rate of the cultural GDP also excludes this part. Finally, the cultural GDP of each Kyoto’s sector can be calculated by multiplying the output by the value added rate.

#### 4.2 Expense-based method

It is relatively easy to calculate the output of the cultural sectors with marketability. However, there are some cultural sectors which are non-profit without marketability. Therefore, it is hard to grasp them based on the “output”. For example, the whole Domain A (Cultural and Natural Heritage) belongs to this situation. The calculation for this part can be undertaken based on the expense aspect such as labor costs. However, both labor costs and depreciation costs are covered for some categories, while only labor costs are covered for others. Although this method for estimating the cultural GDP may lead to an underestimation, we preferred it to a full utilization of an IO table for additionally covering the depreciation costs like the output-based method shown as Table 2. Because for some cultural sectors without marketability like museums, it is hard to make its input and output clear so extracting the value added of them is infeasible. The better way to estimate these sectors is to calculate their expenses. However, it should be noted that depreciation costs are not like labor costs reported in each financial statement. Consequently, we had to ensure that the calculation is accurate rather than directly used the IO table to cover some value added not belonging to them.

**Table 4** The Concordance between multiple sector classifications

Amusement and recreational services	Performing places (except for cinema) Prefectural theater and concert hall, etc.
Communication, image and audio equipment	Musical instrument manufacturing Music software manufacturing (except for CD selling)
Image information, sound information and character information production	Music software (CD, etc.) Book/magazine publishing Movie/video Game(software)
Sports goods, recreation goods and miscellaneous goods rental and leasing	Musical CD rental Video rental
Photographic studios	Photography
Textile products	Traditional textile
Commerce	Book/magazine retailing Music streaming (admission fee needed) Newspaper/news supply
Education	Library
Broadcasting	Broadcasting
Advertising services	Advertising service
Miscellaneous business services	Architectural design

Source: 105 Sectors Input–Output Table of Kyoto Prefecture

### 4.3 Calculation for Domain A

There are five subdomains in Domain A and the method for calculating the cultural GDP is based on the expense aspect as shown in Table 5. For national museums in Kyoto Prefecture, there are only two national museums, namely, Kyoto National Museum and the National Museum of Modern Art, Kyoto. Therefore, the business expenses on their financial statements in *Business Report of National Institutes for Cultural Heritages* in 2015 are considered as the “intermediate inputs” while the labor costs and the depreciation costs are treated as the value added. For prefectural museums in Kyoto, according to *The Summary Table of Japan’s Prefectural Museums and Galleries* reported by ACA (2016), there are no registered museums or museum-equivalent facilities belonging to this category. Thus, there is no data for this subdomain. For private museums, the calculation equation is shown as follows:

$$\begin{aligned} & \text{Cultural GDP (value added) of private museums} \\ &= \text{the number of facilities} \times (\text{the business average labor costs} \\ & \quad + \text{depreciation costs} + \text{taxes and public dues}). \end{aligned}$$

As for the expenses for cultural property protection, the data can be found in *Social Education Expenses* belong to *the Report of The Survey of Regional Education Expense* (MEXT 2015). The “internal labor costs” are treated as the value added of this part.

Japanese government expenses for natural property are extremely diverse and complex and they can only be grasped in a limited way. Therefore, in the calculation of Japan’s national cultural GDP, this subdomain only includes the data of Japan’s four natural heritage sites and none of them belong to Kyoto Prefecture. Therefore, this part is not considered for calculating Kyoto’s cultural GDP.

### 4.4 Calculation for Domain B

According to the *Cultural Administration Research Survey* (ACA 2021), the latest calculation for performing places is from *Survey on Economic Conditions* which has been carried out by METI since 2020. There are no data available for the year 2015. Therefore, the calculation for this part is based on the *2015 Economic Census of Japan*.

Firstly, the rates of Kyoto and Japan are calculated using the number of establishments of performing places. Then the following equation is used:

**Table 5** Output and value added of subdomains in Domain A of Kyoto Prefecture (unit: millionJPY)

	Output	Value added
National museums	3264	750
Prefectural museums	0	0
Private museums	5185	1290
Sub-total	8449	2040
Cultural property protection	3711	250
Natural property protection	0	0
Total	12160	2290

Source: Business Report of National Institutes for Cultural Heritages (NICH 2015); The Summary Table of Japan’s Prefectural Museums and Galleries (ACA 2016); Report of the Survey of regional education expense (MEXT 2015)

**Table 6** Output and value added of subdomains in Domain B of Kyoto Prefecture (unit: million JPY)

	Output	Value added
Performing places (excluding cinema)	17,911	12,072
Musical instrument manufacturing	2182	852
Music software (CD, etc.)	7813	3266
Music streaming (admission fee needed)	780	317
Music software manufacturing (except for CD selling)	1039	434
Musical CD rental	1288	66
Sub-total	31,014	17,008
Prefectural theater and concert hall, etc.	302	3
Total	31,316	17,010

Source: Cultural Administration Research Survey (ACA 2021); Economic Census of Japan (METI 2016a, b, c); Financial Statements of Japan Arts Council (JAC 2015)

**Table 7** Output and value added of subdomains in Domain C of Kyoto Prefecture (unit: million JPY)

	Output	Value added
Photography	2946	39
Crafts		
Handmade Japanese paper	302	81
Ceramic ornaments	107	47
Ceramic painting	86	38
Cloisonne products	11	4
Artificial jewels	80	33
Metal sculpture	84	40
Precious metal jewelry	2721	1308
Natural and cultured pearl jewelry	291	140
<b>Sub-total</b>	6627	1730
Traditional textile	41,076	19,743
<b>Total</b>	47,704	21,474

Source: Census of Manufacture (METI 2016a, b, c)

$$\begin{aligned}
 & \textit{The output in Kyoto's performing places} \\
 & = \textit{the sales in Japan's performing places} \\
 & \times \textit{the rate of Kyoto to Japan in its establishment numbers.}
 \end{aligned}$$

(Here, the sales are considered as the production(output) in the performing places sector.)

Because this part belongs to the amusement and recreational services sector, it is matched to its superior sector in the IO table, followed by the determination of the value added rate. Finally, the value added of performing places can be calculated by the following equation:

$$\begin{aligned}
 & \textit{The value added of performing places in Kyoto} \\
 & = \textit{the output of Kyoto's performing places} \\
 & \times \textit{the value added rate of amusement and recreational service.}
 \end{aligned}$$

Similar to the calculation for Kyoto's performing places, the calculations for the subdomains from musical instrument manufacturing to musical CD rental also follow the procedure of the output-based method. But for the last subdomain prefectural

**Table 8** Output and value added of subdomains in Domain D of Kyoto Prefecture (unit: million JPY)

	Output	Value added
Book/magazine publishing	58,108	24,292
Book/magazine retailing	82,565	55,706
Newspaper/news supply	23,780	9,941
Library	3414	2401
Total	164,454	97,389

Source: Report of The Survey of Regional Education Expense (MEXT 2015)

**Table 9** Output and value added of subdomains in Domain E of Kyoto Prefecture (unit: million JPY)

	Output	Value added
Movie/video	38,290	14,948
Broadcasting	87,457	38,376
Game(software)	37	22
Game(online)	99,516	40,479
Video rental	7	0
Total	225,308	98,067

Source: The Economic Census for Business Activity of Japan (METI 2016a, b, c)

**Table 10** Output and value added of subdomains in Domain F of Kyoto Prefecture (unit: million JPY)

	Output	Value added
Design	8871	4972
Architectural design	63,063	32,972
Advertising service	12,010	3,227
Total	83,944	42,358

Source: The Economic Census for Business Activity of Japan (METI 2016a, b, c)

theater and concert hall, the output and the value added are directly calculated based on the financial statements. The business expenses are treated as the output while the labor cost is considered as the value added. The calculation result is shown in Table 6.

#### 4.5 Calculation for Domain C

Originally, this domain includes three subdomains, namely, art-related work (fine arts), photography and crafts. It should be noted that the data of art-related work (fine arts) in Kyoto are quite difficult to obtain. According to the calculation in the estimation for Japan's national cultural GDP in 2015 by Fujikawa and Kawamura (2021), the calculation of art-related work (fine arts) is from *The Japanese Art Industry Market Research Survey*. However, this report refers to the Japanese national art market and there is no corresponding prefectural data in it. Therefore, the subdomain of art-related work cannot be evaluated in this research due to lack of data.

The calculation for photography is based on the output in the IO table.

For crafts, the classification of Kyoto's crafts is slightly different from that of Japan's national crafts. In this subdomain, Kyoto's traditional textile is added because according to the *Economic Census for Business Activity of Japan* in 2016, the coefficient of specialization (an index to measure the specialization of an industry in a region) of Kyoto Prefecture's textile industry ranked top 1 in the country (METI 2016a, b, c), which indicates the relative degree of integration of Kyoto's textile industry is high in the country. The calculation for crafts is also based on the output in the IO table. The calculation result is shown in Table 7.

#### 4.6 Calculation for Domain D

The calculation for book and magazine publishing, retailing and newspaper/news supply is based on the output-based method. The calculation for library considers all Kyoto's prefectural libraries and the labor costs are considered as the cultural GDP according to the *Report of the Survey of Regional Education Expense* (MEXT 2015). The calculation result is shown in Table 8.

#### 4.7 Calculation for Domain E

The calculation of Domain E is based on the output-based method and due to space limitations, the details are not repeated here. The calculation result is shown in Table 9.

#### 4.8 Calculation for Domain F

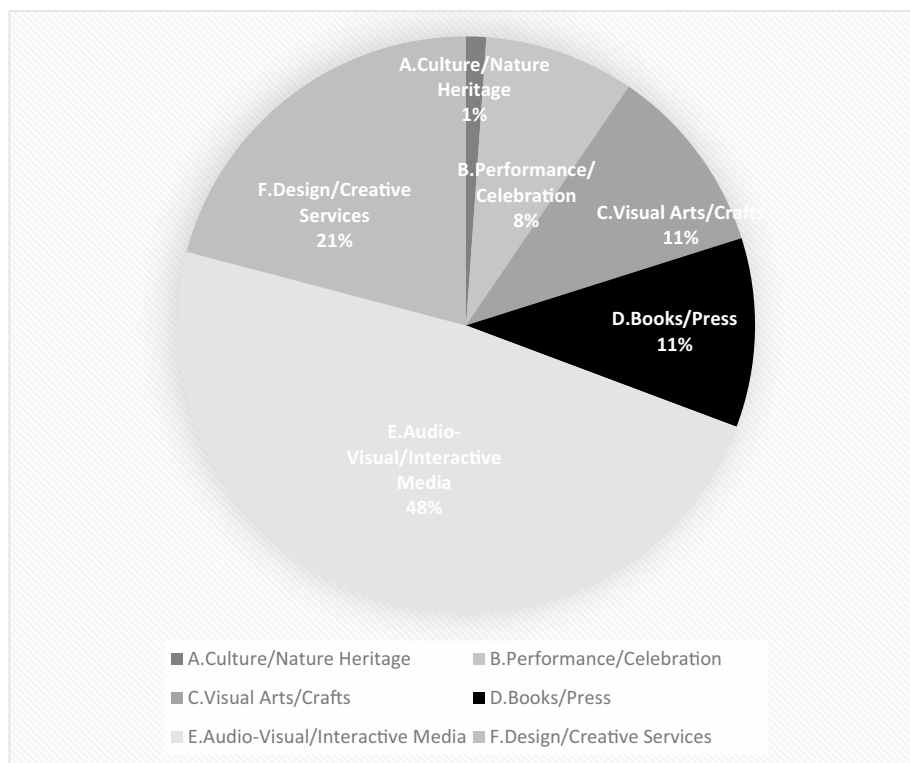
The calculation for Domain F is also based on the output-based method and due to space limitations, the details are not repeated here. The calculation result is shown in Table 10.

## 5 Results and discussion

### 5.1 Cultural GDP of Kyoto Prefecture

As shown in the calculation result, the cultural GDP of Kyoto Prefecture in 2015 is 278.6 billion JPY, taking up approximately 2.0% of Kyoto Prefecture's GDP in the same year. This is slightly higher than the proportion of Japan's national cultural GDP in 2015 (1.8%). As for the details in Kyoto Prefecture's cultural GDP from Fig. 2, Domain E of Audio-Visual/Interactive Media occupies 48% of the whole cultural GDP, which is overwhelmingly stronger than other domains. In addition, Domain F of Design/Creative services accounts for 21% of the whole cultural GDP, ranking second among the six domains. Both Domain D of Books/Press and Domain C of Visual Arts/Crafts occupy 11% of the whole cultural GDP. These 4 domains take up more than 90% overall. However, the cultural and natural heritage and performance, etc., which are associated with culture and arts and come to mind first, account for only a small share of the whole cultural GDP in Kyoto Prefecture.

Compared to Japan's domestic cultural GDP and employment, there are several differences between Kyoto Prefecture and the whole country. Table 11 illustrates that Domain F of Design/Creative Services contributes the largest share (48%) in Japan's domestic cultural GDP while it occupies only 21% in the cultural GDP of Kyoto Prefecture and ranks



**Fig. 2** The share of Kyoto's cultural GDP in each domain. Source: Authors' calculation result

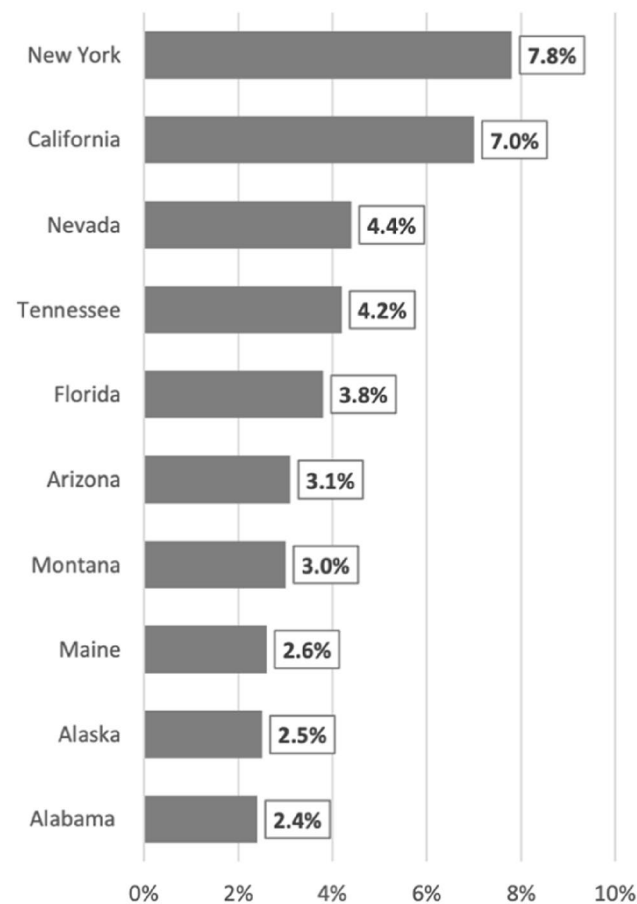
behind the Domain E of Audio-Visual/Interactive Media. Besides, Domain C of Visual Arts/Crafts contributes relatively large share (11%) in the cultural GDP in Kyoto Prefecture, which is higher than its counterpart of 2.6% in the national cultural GDP. Expect for considering the traditional textile in this domain, the strengthening of traditional crafts and visual arts industries in Kyoto Prefecture may account for this.

According to the reported domestic cultural GDP around the world using UNESCO's calculation method, the proportion of the national cultural GDP in Japan is smaller than those in western countries (Fujikawa and Kawamura 2021). Moreover, because there are literally few studies or statistics reporting the cultural GDP of local regions in a country, we can just compare the cultural GDP of Kyoto Prefecture with

**Table 11** Comparison of cultural GDP in each domain between Kyoto Prefecture and Japan

	Kyoto prefecture (%)	Japan
A. Cultural/Natural Heritage	1.1	1.3
B. Performance/Celebration	8.4	6.0
C. Visual Arts/Crafts	10.6	2.6
D. Books/Press	10.6	15.9
E. Audio-Visual/Interactive Media	48.4	25.5
F. Design/Creative Services	20.9	48.0

Source: Authors' calculation result



**Fig. 3** Percent contribution of Arts and Cultural Production in selected states to the total GDP, 2015 (BEA)

those of selected US states with percent contributions to the total GDP in 2015 available. From Fig. 3, it can be obviously seen that the percent contributions of arts and cultural production to the total GDPs in US selected states are higher than that in Kyoto Prefecture, with New York and California being distinctly high. It is suggested that the cultural GDP in Japan still has a lot of room for improvement.

## 5.2 Employment in cultural industries in Kyoto Prefecture

The number of employees can be calculated based on the employment table attached to the IO table of Kyoto Prefecture in 2015. The employment coefficient of each sector, which is originally defined as the ratio of the employment to the output value, can be directly obtained from the employment table attached to the IO table. However, we have to approach it through the value added to calculate the cultural employees using cultural GDP instead of the output. Therefore, we firstly adjusted the employment coefficient as the ratio of the employment to the value added to calculate the new employment coefficient (value employment coefficient in the equation) for each

**Table 12** Estimated cultural GDP in Kyoto Prefecture and Employment in Each Domain (subdomain) (unit: million JPY, person)

	The subdomain of cultural industry	Cultural GDP	Employees
A. Cultural Heritage/Nature Heritage	National Museums	750	64
	Prefectural Museums	0	0
	Private Museums	1290	110
	Cultural property protection	250	21
	Natural property protection	0	0
	Sub-total	2290	370
B. Performance/celebration	Performing places (except for cinema)	12,072	1280
	Musical instrument manufacturing	852	45
	Music software (CD, etc.)	3266	181
	Music streaming (admission fee needed)	317	12
	Music software manufacturing (except for CD selling)	434	24
	Musical CD rental	66	6
	Prefectural theater and concert hall, etc.	3	0
	Sub-total	17,010	1548
C. Visual Arts/Crafts	Photography	39	7
	Crafts	1691	92
	Traditional textile	19,743	8007
	Sub-total	21,474	8106
D. Books/Press	Book/magazine publishing	24,292	1343
	Book/magazine retailing	55,706	8849
	Newspaper/news supply	9941	550
	Library	2401	205
	Sub-total	97,389	10,946
E. Audio-Visual/Interactive Media	Movie/video	14,948	826
	Broadcasting	38,376	1,621
	Game(software)	22	3
	Game(online)	40,479	1,505
	Video rental	0	0
	Sub-total	98,067	3,955
F. Design/Creative Services	Design	4972	1378
	Architectural design	32,972	4258
	Advertising service	3227	158
	Sub-total	42,358	5793
Total		278,588	30,719

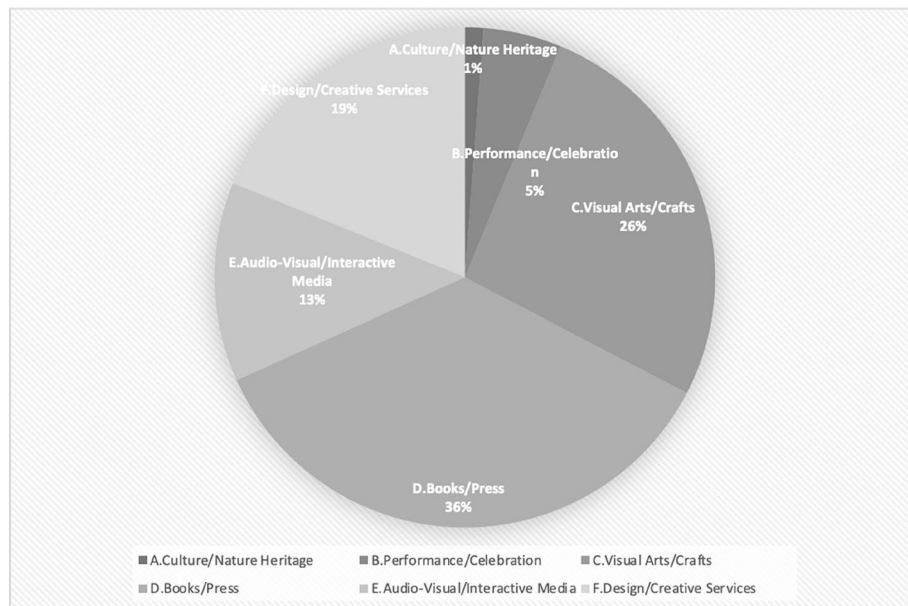
Source: Authors' calculation result

cultural domain, then the number of cultural employees in Kyoto Prefecture can be estimated using the equation as follows:

$$\begin{aligned} & \textit{The number of cultural employees} = \textit{cultural GDP} \\ & \times \textit{value employment coefficient.} \end{aligned}$$

Because there are non-monetary and non-market parts in Domain A of Culture/Nature Heritage and Domain D of Books/Press, the estimated value of the output might not be accurate. Moreover, the art-related work in Domain C of Visual Arts/Crafts cannot be calculated due to lack of data. Therefore, the equation for calculating





**Fig. 4** Proportion of Kyoto Prefecture's employment. Source: Authors' calculation result

the number of cultural employees using an employment coefficient is just an approximate method.

From Table 12, it can be seen that the number of cultural employees in Kyoto Prefecture is approximately 30,719. This accounts for 1.9% of the total number (1,630,786) of Kyoto Prefecture's employees, which is similar to the proportion of Japan's national cultural employees. In addition, it is apparent that the cultural employment and the cultural GDP are at the same level in Kyoto Prefecture. However, from Fig. 4, different from the share of the cultural GDP of each domain, Domain D of Books/Press takes up the largest proportion (36%) in Kyoto Prefecture's employment. Domain C of Visual Arts/Crafts occupies the second largest proportion (26%) while the first ranking Domain E of Audio-Visual/Interactive Media in cultural GDP only occupies 13%, ranking the third in the total employment.

## 6 Conclusion

In this paper, the cultural GDP of Kyoto Prefecture has been calculated according to the UNESCO method. Based on the calculation results, the main conclusions can be drawn as follows:

Firstly, the production of the cultural industries in Kyoto Prefecture accounts for about 2.0% of the total GDP in 2015, which is slightly higher than the proportion of Japan's domestic cultural GDP (1.8%). Although it is believed that the development level of cultural industries in Kyoto Prefecture is somewhat stronger than that of the whole country, 2.0% is not a very large amount. Meanwhile, the detailed cultural GDP share shown in the results illustrates that the cultural Domain E of Audio-Visual/Interactive Media is remarkably the strongest among the six domains, especially the game industry. That is because there are many world-renowned game companies such as Nintendo and Tose, making Kyoto as the game center of Japan. However, which subdomain the value added

created by these famous companies contributes to cannot be seen from the table due to the calculation, which is not based on the financial statements but the nationwide estimate by rates. Moreover, with the rapid advancement in science and technology, the underdeveloped online game industry has gradually become a main contributor to the value added for the cultural and arts industry.

Secondly, based on the estimated workforce size in cultural and arts industry in Kyoto Prefecture, Domain D of Books/Press has the largest proportion in employment but it does not contribute much to the value added. This reveals that the industries in Domain D are relatively backward while those emerging industries in domains E and F have high technology contents.

To sum up, this study further extends the UNESCO's calculation for the cultural GDP to smaller regions rather than being restricted to countries. However, different from the calculation of national cultural GDP, the most difficult part for small regions is lack of detailed data. Therefore, the estimated value calculated by the related proportion might be inaccurate. It is also a challenging problem faced by evaluating culture and arts from an economic point of view. It is still a long way to refine the details of the census data and statistics of the cultural and arts industries. Nevertheless, the culture and arts of Kyoto Prefecture contributes a lot to its total GDP in which the game industry is considerably competitive. Kyoto Prefecture may focus on this competitive industry and vigorously promote its cultural industries based on activating the development of the traditional culture.

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#### **Author contributions**

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##### **Competing interests**

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