

Changes in Cultural Consumption: Ethnographic Collections in Wikipedia

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Abstract

Visits to museums have been studied as hedonic and utilitarian forms of cultural consumption, though limited attention has been given to the access of museum collections online. We perform a unique historic analysis of the visibility of collections in a museum of ethnographic collections and compare 100 years of onsite visits to 5 years online visits. We find two main results: first, access to collections increased substantially online. From a selection of objects available both onsite and online, access grew from an average of 156,000 onsite visitors per year to over 1.5 million views online per year. Onsite, 15.5 million people visited the museum in a span of a century while online, 7.9 million people viewed collections in only the last 5 years. Second, we find a difference in consumer preference for type of object, favouring 3D onsite and 2D online (photographs of objects, particularly when showing them being used). Results support understanding of online heritage consumption and emerging dynamics, particularly outside of an institutional environment, such as Wikipedia.

JEL classification: L31, D12, O35, N30, Z11

Key words: Heritage consumption, Museums, Digital heritage, Access, Exhibition history, Wikipedia

1. Introduction

Visiting museums has become an important leisure activity and touristic attraction (Frey, 2006), predominantly to institutions with a higher ease of physical accessibility (Brook, 2016) and particularly for visitors with higher levels of education, income (Falk and Katz-Gerro, 2015), and an intellectual motivation (Brida, et al., 2015). Understanding consumer preference for cultural goods has further identified a pattern where few products are extremely popular, while the majority of content remains obscure (Clement et al., 2007, Ginsburgh and Ours, 2003). This so-called long tail associated with the superstar museums and artworks (Frey, 2006) has also been found online, though longer and thicker and resulting in a different set of superstars (Navarrete and Borowiecki, 2016).

The availability of collections online has led to the reuse of objects in contexts outside of the museum website. This should not come as surprise. Technological innovation has been identified to change cultural consumption and consumer preference (Potts, 2014). An example can be found in performing arts institutions that adopted digital technologies, which have experienced a broadening and deepening of their consumer base (Bakhshi and Throsby, 2012). Museums seeking to broaden and deepen their visitors have positioned collections where the consumers are: online. Positioning objects in a social media site will reach far more online users than when publishing collections in the museum website, particularly websites of lesser-known museums. A number of heritage institutions, including 25 from the Netherlands, have published collections at the Wikimedia Commons, the online repository that feeds Wikipedia articles. Figure 1 shows a photograph of an object displayed in a museum and a photograph from the museum's collection with the object being used, both serving to illustrate a Wikipedia article that receives an average of 14 views per day.¹

[Insert Figure 1. Two museum objects used to illustrate a Wikipedia article]

Dutch heritage institutions have published over half a million objects in the Commons, representing close to 2.4% of all Wikimedia content (Brinkerink, 2015).

¹ Page views reported by Pageviews Analysis tool, available at <https://tools.wmflabs.org/pageviews>.

Launched in 2001, Wikipedia has been ranked among the ten most popular websites on the Internet.² With more than 35 million articles written, Wikipedia receives about 17 million views per month, in all languages and including mobile access.³ Wikipedia's considerable traffic signals its position as highly preferred site for online information consumption.

Cultural heritage consumption onsite and online has received much attention in the context of the music, film and book markets (e.g. Vallbe, et al., 2015). Analysis has generally compared consumer choice of channel (e.g. legal or illegal, payment subscription) and carrier (e.g. CD, download, streaming). Analysis comparing change in type of content preference when a digital variant is available has not received much attention. Only one study included the variable of type of content, identifying a digital preference for film titles not available onsite (Bodo and Lakatos, 2012). This paper intends to fill this void by comparing the consumer preference onsite and online per type of content.

In this paper, we focus on two specific questions: first, we explore the changes in consumption by comparing physical exhibition and online publication in an open data environment. We analyze object mobility and visibility. Second, we try to explain the differences in preference of consumption by analyzing patterns of object selection. We find an exponential increase in consumption when moving into the digital realm, where the onsite environment is limited to a number of exhibits a year, the online environment awards unrestricted access 24/7 from across the (digital) globe representing an important complement to collection accessibility. We also find new preference patterns in the online environment: readers favour English pages that include rich and diverse content (quality indicator), while editors favour alternative languages with little content, suggesting a trend to enrich the information market. This is particularly relevant for ethnographic museums giving digital access to their holdings, in fact facilitating cross-cultural encounters for further knowledge making (Witcomb, 2007).

² Ranking made by Alexa (<http://www.alexa.com/topsites>).

³ Views per month vary, the highest has been recorded at over 22 million on September 2014 (<http://stats.wikimedia.org/EN/TablesPageViewsMonthlyCombined.htm>). For more on Wikipedia see <https://en.wikipedia.org/wiki/Wikipedia>. Wikipedia is one of the projects of the Wikimedia Foundation, which include the Commons, Wikidata Wikibooks, Wikitionary, Wikinews, Wikiquote, Wikisource, Wikiversity, Mediawiki and Wikivoyage (<https://wikimediafoundation.org/wiki/Home>). All Wikimedia projects, in all platforms, received 17.9 billion views on July 2015 (see report card at <http://reportcard.wmflabs.org/>).

Results contribute to the empirical research on consumer behaviour and heritage consumption preference, particularly of hedonic products (content) available free of charge in the online market. We illuminate the relationship between cultural consumption patterns online and onsite, by availing partly of new tools that enable analyses of consumer behaviour around the content provided by galleries, libraries, archives and museums (the so-called GLAMs). We further contribute to the understanding of non-profit organizations, with focus on museums and on the Wikipedia environment. This paper is the first, to the best of our knowledge, to compare change in consumption preference of heritage content from an onsite to an online environment in an empirical framework using historic visitor data.

The remaining of the paper is organized as follows: in section 2, we define consumption (and use) of heritage and review the literature on the consumer preference of hedonic products. In section 3, we review the literature on consumption of Wikipedia content across topics and languages. In section 4 we present the data, describe our method and present the quantitative analysis followed by a discussion in section 5. We end with conclusions in section 6.

2. Cultural consumption

Cultural consumption refers to cultural goods and services that are used for direct satisfaction of individual needs, or collective needs of members of a community (EC, 2008).⁴ Consumption of museum services generally measure the number of people visiting the exhibits, a measure we pursue in the underlying study, or the price of access (e.g., Borowiecki and Navarrete, 2015, who study how museum prices are influenced by VAT rates for admission to cultural services). Much less attention has been given to complementary forms of consumption, such as (catalogue) sales, image licensing, or online view of the collections.

Visiting museums onsite has been associated with a number of socio-economic determinants, including greater personal capital (as level of education and art education of visitors and of visitors' parents), gender (female reporting higher

⁴ The definition by the SNA 2008 refers to consumption in general. It states that consumption takes place without further transformation in production, which is no longer applicable in the consumption of digital heritage through the participatory web. The case of Wikipedia is a good example, which allows consumers to act as producers when serving as editors.

number of visits), distance to metropolitan areas (Ateca-Amestoy and Prieto-Rodriguez, 2013), and ease to access the museum (Brook, 2016). The reasoning behind museum visits has been associated with willingness to pay (Frey and Meier, 2006), availability of substitute goods (Rouwendal and Botter, 2009), but also to fulfilling recreational activities (e.g. curiosity, spending free time) and satisfying an information need (e.g. learning something new, research) (Johnson and Thomas, 1998; Frey, 1998; Brida, et al., 2015). Motivation for online heritage consumption has been linked first and foremost to remote access (Booth, 1998), but also to academic research, creative reuse, educational use, commemorative use, personal enjoyment, preservation, and commercial use (Borowiecki and Navarrete, 2016). Most museum website traffic is linked to planning a visit onsite, though viewing collections online has been found complementary to the physical museum visit (Marty, 2007).

Having a hedonic or utilitarian motivation to visit museums does not have to be exclusive. Dual-purposed consumption has been identified in information systems that satisfy both an increase in productivity (utilitarian) while providing pleasure to consumers (hedonic) (Wu and Lu, 2013). Acceptance of new information systems has further been linked to a combination of perceived usefulness and perceived ease of use, where the latter weighs as stronger determinant (Van der Heijden, 2004). It can be thus expected that encyclopaedic articles that include heritage content (e.g. images, sound) are more pleasant, in addition to being more useful, as illustrations can serve to provide additional contextual information.

Consumption is linked to the user's perception of value, making value, according to Throsby (2001:28), various and variable. Consumers can further add value to the option of becoming producers, option increasingly present in networked environments online. This can be referred to as *prosumption*, where the consumer supports the production process through contributing content and supporting the various activities (e.g. Amazon consumer reviews). Criticism has risen to the exploitation of free labour to benefit corporations, leading to an alternative that highlights the open nature of production in the digital creative economy (e.g. open source software). This communal content creation process can be referred to as *produsage*, where the product is never completed but exists as continuous user-driven process (Bruns, 2013). Wikipedia is the exemplary case of an unfinished product that rates among the most consumed online.

For the purpose of this paper, we define consumption of heritage within the Wikipedia environment as use of heritage content online. This includes viewing articles as well as editing articles containing heritage media.

3. Consumption patterns in Wikipedia

Since its launch in 2001, Wikipedia has grown to become a key online source of information. The content in Wikipedia includes 35 million articles in close to 300 languages, making it a rich source of data in the expanding Linked Open Data cloud. Projects like DBpedia or WikiData extract, structure and make the content available in a machine-readable format that facilitates reuse, such as Google's Knowledge Graph (Lehmann et al., 2015). The Wikimedia Foundation projects receive millions of visitors daily, 49.5% of which visit Wikipedia articles and 47% of which visit images and other multimedia resources, adding up to 96% of all server traffic (Reinoso et al., 2012). Images, and multimedia, are an important part of the content delivered by Wikipedia.

Wikipedia receives more than 400 million unique visitors per month,⁵ of which nearly half accounts for visits to the English edition (Reinoso et al., 2012). Article views present cycles, with lower traffic during the weekend and holiday periods and higher traffic during school exam periods (Ratkiewicz et al., 2010b).⁶ Bursts on article views can be linked to “appropriately chosen queries on Google Trends, suggesting that these bursts are often driven by external events” (Ratkiewicz et al., 2010b:295). One such example is the beer poisoning taking place during a funeral in Mozambique in 2015.⁷ Finding the *appropriate* query terms may be possible for articles related to critical events but can prove challenging when exploring the use of articles containing heritage collections content. Alternatively, increased views can result from an attention burst to articles and objects being featured on the Wikipedia home page (Gyllstrom and Moens, 2012). Number of page

⁵ Number of visitors in May 2015, as reported in the Wikimedia Report Card (<https://outreach.wikimedia.org/wiki/GLAM/Resources/Tools>). See also the <http://reportcard.wmflabs.org/>.

⁶ In comparison, museums in the US generally receive lower visitor numbers the first 2 to 3 weeks in September and in December, due to communities going back to school and preparing for the winter holidays (Lord and Piacente, 2014).

⁷ https://en.wikipedia.org/wiki/Mozambique_funeral_beer_poisoning.

views and edits in Wikipedia articles has also been linked to popular films (Mayestyan et al., 2013).

In addition to time patterns for consumption, consumer preference can be analyzed by topic. Lehmann et al. (2014) quantified the preference of consumers specific to biographical articles (a popular topic) in the English Wikipedia (the largest edition) and found that biographies of historical figures, general history, places and culture were rated among the 500 most popular articles. Geography, history and politics have been identified as highly popular topics, which Spoerri (2007a) defined as prototypical encyclopaedia topics.⁸ Spoerri (2007b) further found the topic entertainment (including music, films, comics, performers, TV series, video games and books) to be the most popular topic within the top 100 most viewed English Wikipedia pages, followed by politics and history, geography and the arts. Images from heritage organizations can be expected to illustrate such encyclopaedic topics, as collections serve to document history, places and culture.

Consumption patterns may vary between readers and editors of Wikipedia. A study by Reinoso, Leon and Ortega-Valiente (2012) found a discrepancy in the topic preference of readers and editors: articles about geography were most viewed among the German and French editions while most edits were found among German, French and Spanish editions; articles about arts and humanities were most viewed in the Spanish and French edition while most edits were found in the French edition; arts and entertainment articles were most viewed in the German, English and French editions while most edits were found in the Spanish edition.

Research on the use of Wikipedia to distribute museum collections reported that the long-tail often found in cultural consumption was also present online, though longer and thicker (Navarrete and Borowiecki, 2016). Results support the view that Wikipedia, and Wikimedia Commons, are important intermediaries for cultural consumption online. We hope to contribute to this discussion by presenting our results on the use of Dutch ethnographic collections in the top seven Wikipedia languages.

4. Data and Analysis

⁸ Categories of Wikipedia pages generally include Entertainment, Politics, History, Geography, Sexuality, Science, Computers, Arts, Religion, Holidays, Current events, and Drugs as key topics (in order of popularity as found by Spoerri, 2007b).

4.1 Object accessibility

In order to compare a change in object accessibility onsite and online, we chose an institution with a sound historic record of onsite exhibitions that had a large enough portion of its collection published online. We found the ethnographic museum in Amsterdam (NMVM),⁹ with a collection of 600,000 objects, holds a digital record of exhibitions per object for the past 100 years in its digital database The Museum System (TMS). A query on the exhibited objects in its current location (opened in 1927) showed that 10% of the collection has been exhibited since. We reviewed the museum's archive to identify the number of people visiting the exhibits and used the annual reports to determine the number of onsite views of the collection from 1911 to 2010 (see Figure 2). We also found two major visitor surveys that outlined the socioeconomic make-up of the visitor population in the 1950s.

[Insert Figure 2. NMVW visitor numbers (1911-2010)]

From the graph, important events can be quickly identified in the museum's last 100-year history. First, the museum moved from Haarlem to open at its current location in Amsterdam in 1927 with a visible change in visitor numbers towards a general upright slope. A peak can be found during the German occupation in 1944, to be followed by a drop after liberation in 1945, presumably as citizens were busy reconstructing the post-war country.¹⁰ Gradually, visitor numbers grew to peak in 1971 with the *Orchids* exhibit. A significant drop is visible during 1976 when the museum was closed for renovation. The most popular year up to date was 1986, when the NMVW received 300,000 visitors for the exhibitions *Indigo* and *The Human Story*. A decline in visitor numbers reached its lowest in 2000 after which an upward slope can be observed. Accumulative, the NMVW has received 8.4 million visitors onsite during the last century.

⁹ The Tropenmuseum is now part of the *Nationaal Museum van Wereldculturen* (Dutch National Museum of World Cultures, or NMVW).

¹⁰ Data from the Statistics Netherlands show that overall Dutch museum visits almost doubled after the Second World War, and after the Dutch Independence in 1952 museum visitor numbers more or less stabilized. The Tropenmuseum, together with the Rijksmuseum and the Stedelijkmuseum were the 3 most visited museums in Amsterdam, accounting for 85% of all visitors in 1950.

In order to measure the online visitors, we lacked analytics for the museum's website at object level for which we chose an alternative online environment. We selected Wikimedia, where the museum has published nearly 50,000 objects of which 12% are being used in Wikipedia articles. We used the *BaGLAMa2* tool to identify the visitors online, represented by number of views of Wikipedia articles containing the museum's collection.¹¹ Figure 3 shows the number of views of all Wikipedia articles containing at least one image from the NMVW, from May 2010 and until June 2015 (52 months). Accumulative, the NMVW has received 448.3 million visitors online in the past 5 years.¹² In comparison, the Tropenmuseum collection website provides access to their entire collection of over 600,000 objects and receives an average 50,000 page views per month.

[Insert Figure 3. Wikipedia article views from category Images from the NMVW (March 2010-June 2015)]

A general growing slope can be found with peak on December 2013, with 17.7 million views, followed by a downward slope. The reasoning behind the decline may be related to the increase in mobile views, not captured by the *BaGLAMa2* tool, which can be observed in the general use of Wikipedia.¹³ A similar declining trend can be seen in the English, German, Dutch, French and Spanish Wikipedia page views, as in most languages, though with an earlier peak on February 2013 to be followed by a downward slope. The downward slope observed in all languages, and in spite of the increase in mobile use, may also reflect Google's use of the Knowledge Graph, available on December 2012 in English, German, French and Spanish.¹⁴ Since then, Google displays key information from Wikipedia into a box on the top right of

¹¹ The BaGLAMa 2 tool was developed by Magnus Manske to track page views from specified categories, defined as all articles containing images from a specific Wikimedia Commons category. We selected the category Images from the Tropenmuseum <https://tools.wmflabs.org/glamtools/baglamma2/>.

¹² The graph shows gaps in data collection from May 2010 until July 2012, due to a technical error, after which data is collected monthly.

¹³ Since early 2016, and after data collection and analysis, Wikimedia reported that "Wikistats are derived via webstatscollector from incoming squid logs" instead of the comScore data report previously used (<http://reportcard.wmflabs.org/#>). The new data report card accounts for mobile views and shows an increasing page view slope. These are pageviews, not number of visitors, as the Wikimedia Foundation protects the privacy of their IP visitors.

¹⁴ See more on Google's Knowledge Graph on https://en.wikipedia.org/wiki/Knowledge_Graph.

the browser, presumably satisfying the user's questions who decreasingly clicks further into the Wikipedia article. The Indonesian Wikipedia does not present this trend, where Google's knowledge graph is not available and page views continue to increase instead.¹⁵

[Insert Figure 4. Number of Wikipedia pages containing NMVW collection (top 7 languages)]

[Insert Figure 5. Wikipedia articles views containing NMVW collection (top 7 languages)]

Figure 4 shows the number of pages made in the seven most popular languages (English, Indonesian, German, Dutch, French, Spanish and Japanese) while Figure 5 shows the number of views per Wikipedia language in the same period. Noticeable is the visible preference towards the English Wikipedia articles, followed by Indonesian and all other languages. This may be explained by the size of the general English Wikipedia, being the largest edition (representing 51% views and 14% articles of the total Wikipedia), and by the prominent use of English in many countries across the globe. Data show a striking difference between the preference of readers, being significantly higher in English, and of editors, predominantly working at the Indonesian and English versions. This is explained by the nature of the collections, being ethnographic collections with a significant share originating in Indonesia. Table 1 shows the use of Wikipedia in the top seven languages containing the NMVW collection. English remains by far the preferred version for global consumers.

[Insert Table 1. Wikipedia views and articles (total and NMVW) in June 2015]

4.2 Correlates of object views

¹⁵ For information on Wikipedia page views per language see http://stats.wikimedia.org/EN/ReportCardTopWikis.htm#lang_fr.

In order to understand the influencing factors increasing object views, we ran a simple linear regression with robust standard errors where object views was a function of the number and length of exhibits and online publication as well as of characteristics found in Wikipedia articles, including language, number of images, and topic. From the 50,000 objects available in the Commons, we identified those that had also been in a physical exhibit resulting in 5,815 objects, of which we selected those used more than 27 times in Wikipedia. We used the 95 objects from the NMVW found in 51 Wikipedia articles as data set, some objects being present in more than one article, totalling 140 observations. Table 2 shows the results. The first model is a simple OLS regression of total views (column 1) and average views per month (column 2). A second pair of models contains additionally type of object fixed effect (columns 3 and 4), so that objects in the same website in multiple languages or multiple NMVW objects in one single website were accounted for. The third model includes in addition type of object (2D, 3D, video and text) fixed effects (columns 5 and 6), in order to account for the unobservable fundamental differences across types of object.¹⁶

[Insert Table 2. Object view as function of exhibits and inclusion in Wikipedia articles]

Not surprisingly, the longer the object was on view online, the higher the coefficient for total views. This agrees with the findings by Ratkiewicz et al. (2010b) of increasing article views as function of time. We find that object view increases when more images are present in the article. We suggest that articles that have a larger number of images have had a longer time to develop and therefore have richer and more mature content, reflecting a higher quality. Therefore, the quality of the article appears to positively influence the number of views. This is not the case, however, when there are many images exclusively from the NMVW museum as this results in a significant negative coefficient for most regressions. The high number of images from one source may be linked to one editor preference for content rather than

¹⁶ By 2D we understand photographs, by 3D we understand photographs of 3D objects in the collection. Though adoption of 3D imaging is limited by heritage organization's digital know-how, some efforts to make available heritage objects using 3D technology are increasingly popular, as the case of <https://sketchfab.com/museums>.

quality of the article and therefore works against the popularity of the article. Further, consumers tend to value diversity (Ranaivoson, 2012), perhaps as additional signal of a developed product, in this case diversity of image source as signal of quality of the Wikipedia article.

Onsite number of exhibitions is negatively related with the number of views. This may come as a surprise, but could be partly driven by the low variation and a high number of zeros in this explanatory variable. Furthermore, when we accounted for type of object, the negative coefficient disappears (though positive is not significant). This can be explained by the greater preference for 2D objects online, which have little visibility onsite as preference is given to 3D, and vice versa. Further, 2D preference by editors was found for photographs of objects used in their original context, rather than in an isolated white box photographic studio, pointing to the illustrative role of collections in Wikipedia articles. Crowdsourcing is another variable that appears as significantly negative, until we account for object type, turning into a significant positive. All nine cases of crowdsourced images are of 3D objects being photographed by the public to be used in Wikipedia, not surprising as 3D has higher prevalence onsite and lower presence online (hence the need for crowdsourcing efforts such as Wiki Loves Art)¹⁷.

Object view also responds to characteristics of the Wikipedia articles. English is, as expected, the strongest positive language variable, followed by Indonesian and Dutch. This is not surprising as English is the largest Wikipedia edition, the NMVW museum is located in the Netherlands and a large part of the NMVW collection originates from Indonesia. Another determinant is the topic of the article. We divided the articles analyzed based on topics defined by Spoerri (2007b) to include science (our baseline category), history, culture, sexuality and geography, the later exhibiting the strongest correlation coefficient by far. All other topics resulted positive though not significant associations.

The results above presented are not without shortcomings. First of all, the manual intensity of data gathering required (in spite of the tools available to automate part of the process) prevented us from working with a larger sample, as this exercise

¹⁷ Wiki Loves Art is a photo contest organized yearly, since 2009, in collaboration with museums and heritage institutions to photograph collections displayed for use in Wikipedia by the general public.

included a first try at the methodology. Nevertheless, and even with the data gaps and with the small size sample, results are strongly consistent. Future analysis could include a larger data set as well as the collections of multiple institutions. Our sample further included a few objects with exhibitions taking place at the moment of writing, for which onsite visitor numbers were not yet available. Still, given the wide longitudinal data collection period for visitors onsite, results are an indication of visibility for what have been the most popular objects in the last century.

The number of views online per object does not account for the positioning of the image within the article. From our sample, three objects are located at the top subject box, one object is located at the bottom category box (negligible), and other objects are located throughout the articles. We did not account for position (e.g. strong, mid or low visibility) because we lacked the comparable evaluation data for the onsite exhibition, which present similar dynamics depending on object positioning in the physical space. Nonetheless, the onsite comparison to the online environment gives a number of clues on the consumer preference for heritage online.

5. Discussion

Consumption of the museum collection online is significant. In the last century, 8.4 million people have physically visited the museum NMVW while 448.4 million people have visited Wikipedia pages containing images from the NMVW collection. That is an average of 94,500 visitors onsite per year increasing to 1.7 million visitors online per year. In comparison, the collection receives 600,000 annual views at the museum website.¹⁸ From the selected objects, both present onsite and online, the increase presented a different rate from 2,223 visitors per year onsite to 8,439 views per year online. This evidences the change in cultural consumption brought by changes in technology, affecting quantity, diversity, and consumer preferences, as suggested by Potts (2014).

Wikipedia, as online distribution channel, has proven key to position the content into niche markets. The museum not only benefits from the infrastructure in place, which is being developed to grow mobile, but also from the community of

¹⁸ The NMVM has two websites, one to provide general information about the museum (with the usual content of a museum website) while the second website functions specifically to give access to the collections and serves as collections catalogue.

users who keep the content updated, what Benghozi and Benhamou (2010) refer to as information curation, and who increase the chance of reuse (Zhang and Kamps, 2010). Clearly, all are benefits for the museum at a marginal cost. For heritage institutions it is to be expected that using existing social online networks to disseminate content is less costly than developing their own online environments, this in terms of the resources needed to develop and maintain the technical platform as well as the community of users, costs identified by Benghozi and Benhamou (2010) and by Ongena et al. (2012). Further, the Wikipedia environment offers multilingual layers of access to content where the same object may be used in similar articles in different languages as well as to illustrate a variety of different topics. In turn, Wikipedia benefits from having a larger repository of images to illustrate articles and hence enrich their quality by increasing diversity, an important characteristic valued by consumers (Ranaivoson, 2012). Ideally, collaboration would involve more than *image dumping* by museums into the Commons but also include enrichment of articles by staff at heritage institutions, participation in the Wiki Loves Art events, or other forms of contribution to the community of users. In this way, the museum would favour a *produsage* environment over a *prosumption* relation (Bruns, 2013).

The significant increase in object views of collections made available with a CC-BY-SA license (Creative Commons license Attribution Share alike) in the Commons repository, support an open data strategy to increase social welfare. Increasing consumption of collections by improving physical accessibility (Brook, 2016) could easily be translated into publication of collections online that support an accessible legal framework.

In terms of the information signals to support selection of quality products, a striking difference is found between the onsite and the online environments. While experts (curators) select objects for physical exhibitions, it is the consumers (community of Wikipedia users) that select objects to be included in the Wikipedia articles. In the museum, curators, conservators or marketing staff select objects to advance knowledge in the field, responding to questions originating from the collections in a research-based approach, or select objects responding to public interest, driven by the market and current events (e.g. death of a popular artist) (Lord and Piacente, 2014). The process leads to a finished exhibition that has an opening and a closing. In Wikipedia, the crowd of editors is responsible for selecting objects,

susceptible to individual interest and digital know-how, in a non-institutionalized process, with no particular start or finish. Images can be added or replaced as the article expands and as new images become available in a continuous editorial process. Information signals available for online editors include descriptive metadata (e.g. name of the person being depicted), quality of the image (e.g. resolution) as well as source of the object (e.g. heritage institutions). It is worth noting that this analysis revolves around museum objects, all of which have, by definition, been curated by experts before being made available at the Commons, with a marginal share photographed and uploaded by the crowd (through the Wiki Loves Art program).

Consumer selection for attending exhibitions and for reading Wikipedia articles follow similar information signals to determine quality though with different variants. Visitors of physical exhibitions may follow the *must see list* provided by tourist guides or other forms of ranking mechanisms, which, in combination to a series of socioeconomic factors, determine consumer choice for one museum or another (Frey and Meier, 2006; Ginsburgh and Ours, 2003). Online, the high traffic to the Wikipedia site, in all languages across the globe, signal a general consumer preference for the site as information source (a *must read information source*). Inside Wikipedia, consumer selection follows quality signals of length of the article and number of images from multiple sources in addition to a series of internal ranking mechanisms, such as the featured article or picture in the home page.

Consumer preference cannot be measured in terms of sales (price and quantity sold as customary in empirical economic analysis), because heritage content in Wikipedia is available free of charge. For this, we have analyzed the number of views to articles containing the NMVW collection. The expected school-related cycles are observed, with lower number of views during the summer and winter school recess, confirming results by Ratkiewicz et al. (2010b). We also find a discrepancy in the popularity of articles viewed, with a strong preference for the English version, and the articles edited, with a higher number of articles found in the Indonesian version. The disclosed difference in consumer activity (edits and views) is in line with the characterization of the overall Wikipedia traffic previously found by Reinoso et al. (2012).

7. Conclusions

The adoption of digital technology in all segments of life has, inevitably, also brought changes to cultural consumption. We find evidence that the quantity of goods consumed has greatly increased in an online environment, leading to observable changes in consumer preference, favouring high quality and diversity of content.

We investigated the change in accessibility of museum collections after digitization by comparing onsite and online object accessibility. We used data from the ethnographic museum in Amsterdam (NMVW) and compared exhibitions in the last century (onsite access) to Wikipedia articles from the last five years (online access). We found that object accessibility grew exponentially from 94,500 visitors onsite per year to 1.7 million visitors online per year.

We also analyzed the changes in consumption preference and found two distinct variants reflecting consumption form (physical and online). We found that objects available for view at the museum exhibition halls were selected by experts (museum curators), presenting a strong preference for 3D objects. In contrast, object selection for Wikipedia articles was conducted by the Wikipedia community, presenting a strong preference for 2D objects. The online preference for 2D images, and specifically depicting the object being used and in context, has implications for further digitization projects. Multiple views of an object may give a richer representation and hence satisfy multiple user needs, to include the object as art piece, in context, or being used and in movement.

Consumption of Wikipedia articles further presented a preference for quality articles, including multiple images from different sources, on topics related to geography in the English version. English remains by far the preferred version for global consumers.

We can conclude that institutions interested in increasing accessibility to collections benefit from publishing collections online in platforms such as Wikimedia. Museums can further benefit from active networked communities that keep content updated, advance technological development, and further support the greater access to collections, such as the one found in the Wikipedia community. In turn, Wikipedia benefits from a greater selection of images to enrich articles and hence gain greater popularity as a quality information source online.

Research in understanding digital cultural consumer preference from museums, libraries and archives is extremely limited. Future lines of research using the Wikipedia environment include a comparison between museum types (e.g. science, art, history), between heritage organizations (e.g. archives, libraries, museums), between objet types (e.g. text, image, video), and between countries of origin (from collections and from viewers). Another line of research involves the analysis of costs related to participating in an open online environment, to identify the impact of the Wikipedian in Residence, for instance.

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Figures and Tables

Figure 1. Two museum objects used to illustrate a Wikipedia article

The image is a screenshot of the Wikipedia article titled "Kris of Knaud". The browser address bar shows the URL "https://en.wikipedia.org/wiki/Kris_of_Knaud". The page layout includes a left sidebar with navigation links such as "Main page", "Contents", "Featured content", "Current events", "Random article", "Donate to Wikipedia", and "Wikipedia store". The main content area has a tabbed interface with "Article" selected. The article title "Kris of Knaud" is prominently displayed, followed by the text "From Wikipedia, the free encyclopedia". The article text begins with "The **Kris of Knaud**, also known as the **Keris of Knaud** or **Knaud's Kris**, is the oldest known kris surviving in the world.^[1] Given to Charles Knaud, a Dutch physician, by **Paku Alam V** in the 19th century, the kris is on display at the **Tropenmuseum**, Royal Tropical Institute, Amsterdam." To the right of the text is an image of the kris, with a caption: "The Keris of Knaud exhibited at the Amsterdam Museum of the Tropics." Below the main text is a section titled "The history of the kris" with an "edit" link. This section contains several paragraphs detailing the kris's history, including its date (1264/1342 AD), its association with the Majapahit kingdom, and its ownership by Charles Knaud and Paku Alam V. To the right of this section is a black and white photograph of Paku Alam VIII, with a caption: "Paku Alam VIII, successor to Paku Alam V." The left sidebar also includes sections for "Interaction" (Help, About Wikipedia, Community portal, Recent changes, Contact page), "Tools" (What links here, Related changes, Upload file, Special pages, Permanent link, Page information, Wikidata item, Cite this page), "Print/export" (Create a book, Download as PDF, Printable version), and "Languages" (Bahasa Indonesia, Edit links).

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Kris of Knaud

From Wikipedia, the free encyclopedia

The **Kris of Knaud**, also known as the **Keris of Knaud** or **Knaud's Kris**, is the oldest known kris surviving in the world.^[1] Given to Charles Knaud, a Dutch physician, by **Paku Alam V** in the 19th century, the kris is on display at the **Tropenmuseum**, Royal Tropical Institute, Amsterdam.

Contents [hide]

- The history of the kris
- References
 - Bibliography
 - Notes and citations

The history of the kris [edit]

The kris bears the date of 1264 (which correspondends to 1342 AD) in its iron blade. Scientists suspect that due to its special features the kris is even older, but was decorated during the heyday of the **Majapahit** kingdom to celebrate an important event.^[2] The kris bears scenes from the **Ramayana** on an unusual thin copper layer which partially covers it.

Charles Knaud (**Batavia** 1840 - **Amsterdam** 1897) was a Dutch physician and **dukun** (shaman) at the court of **Yogyakarta**. Knaud, who had studied **Javanese mysticism**, treated and cured the son of Paku Alam V (1878-1900), ruler of the hereditary **Pakualaman** principality in the **Sultanate of Yogyakarta**, of what the ruler believed to be "guna guna" (black magic). For saving his son's life, Paku Alam V, who was also a **freemason** at the Mataram lodge of Jogja,^[3] granted him a prestigious heirloom, a kris.^[4] It was the oldest kris in the prince's collection.^[5]

From 1903, the kris was believed to be lost, but it remained in the possession of Knaud's family. Long after Knaud's death, during **World War II**, his family buried the Keris in their garden to protect it during the Japanese occupation. During the **Indonesian National Revolution**, they took it to the Netherlands, where it was safeguarded in the family's bank safe.^[6]

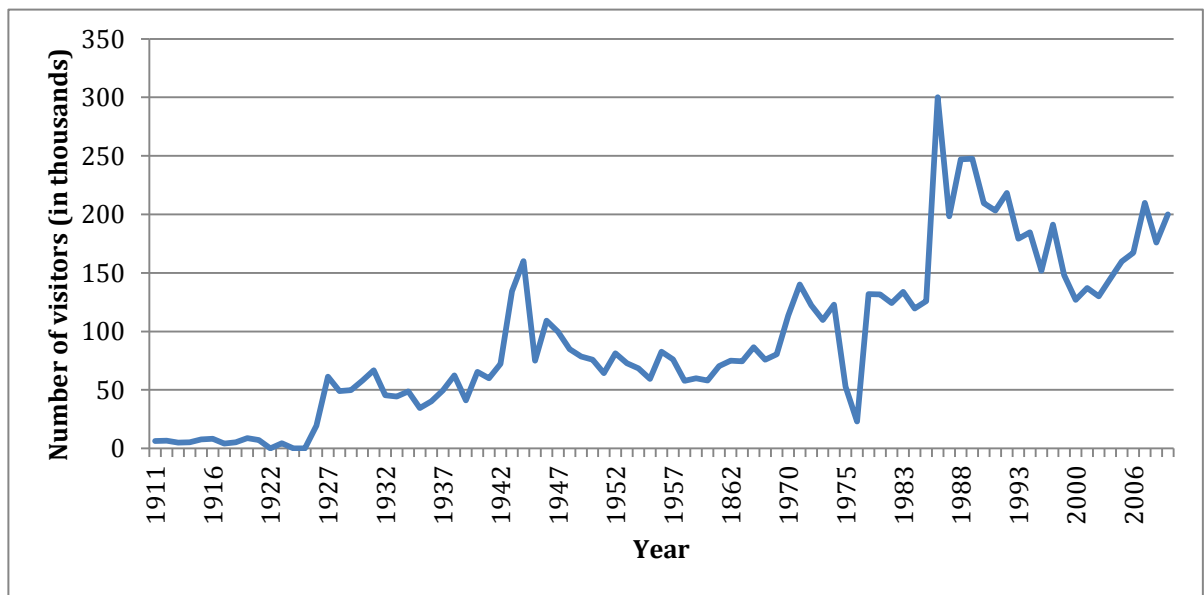
In the 19th century, a plaster cast and a photograph of the kris were kept in the holdings of the Bataviaasch Museum of Arts and Archaeology. In 1920, N.J. Krom dedicated a full page to the keris in *Hindoe-Javaansche Kunst*. David van Duuren a curator with the Royal

The Keris of Knaud exhibited at the Amsterdam Museum of the Tropics.

Paku Alam VIII, successor to Paku Alam V.

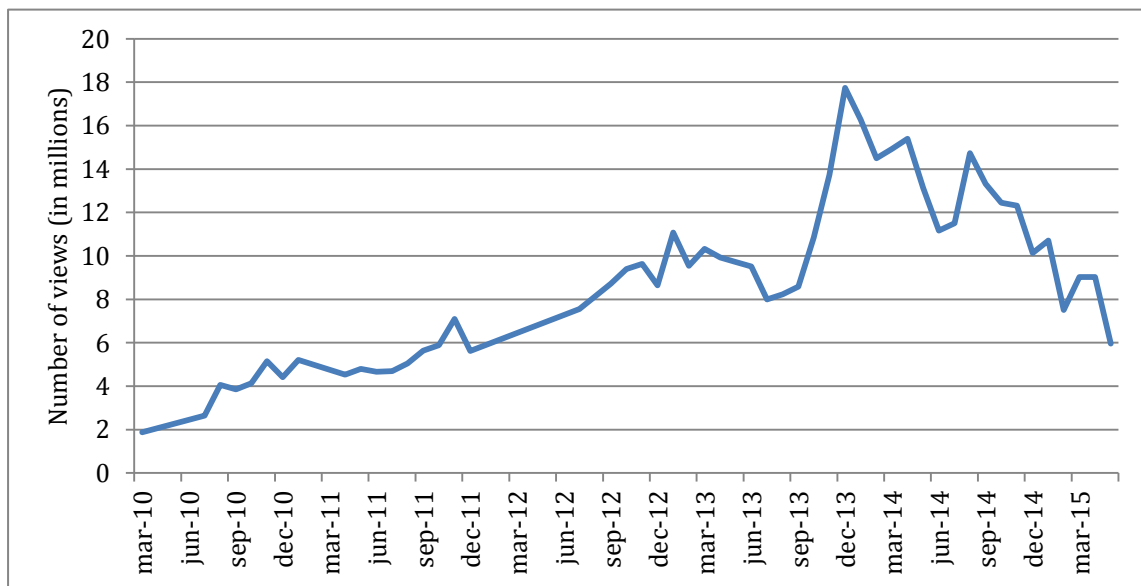
Source: https://en.wikipedia.org/wiki/Kris_of_Knaud.

Figure 2. NMVW visitor numbers (1911-2010)



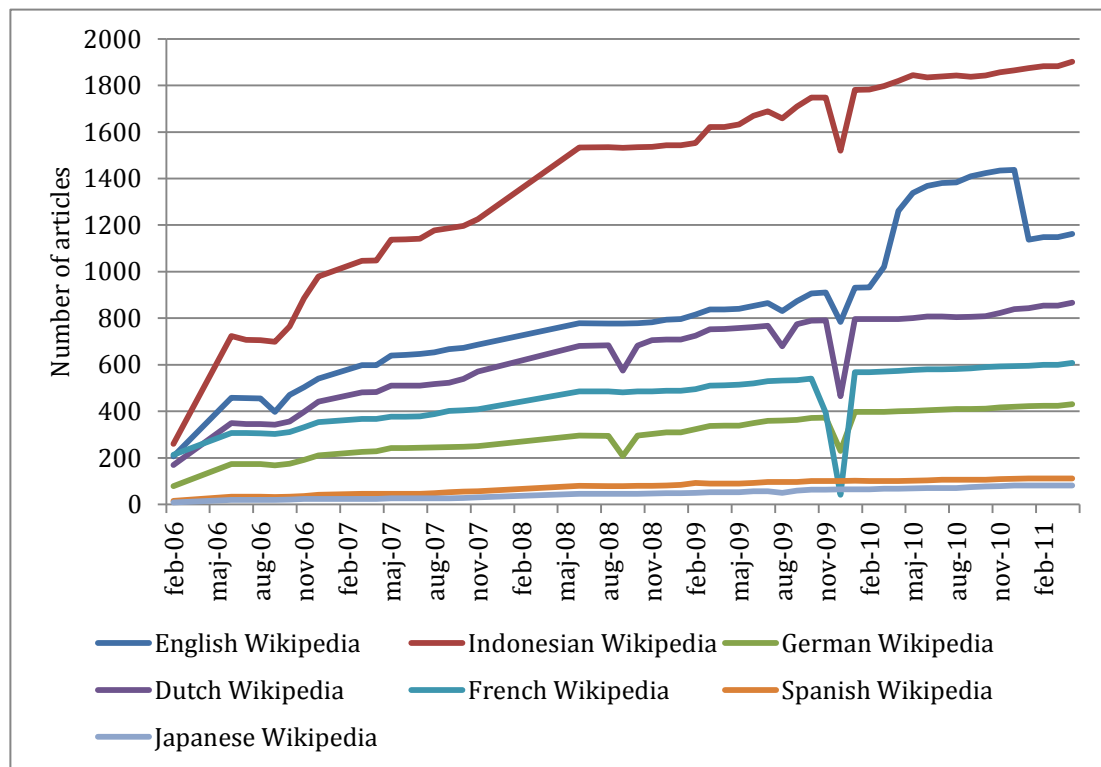
Source: own, Tropenmuseum annual reports.

Figure 3. Wikipedia article views from category Images from the NMVW (March 2010-June 2015)



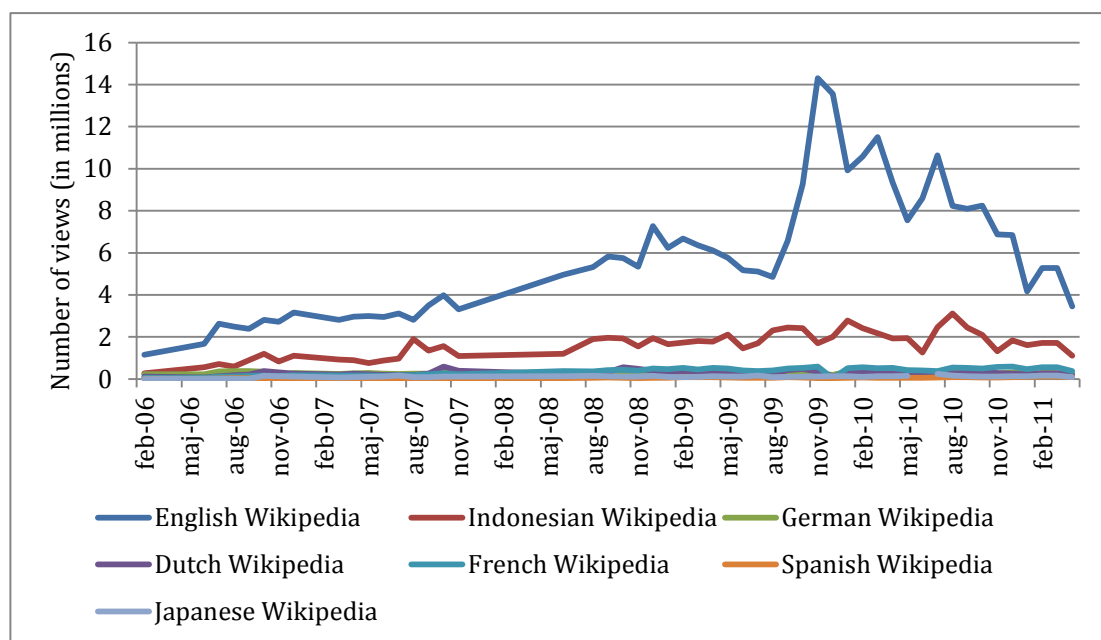
Source: BaGLAMa2.

Figure 4. Number of Wikipedia pages containing NMVW collection (top 7 languages)



Source: BaGLAMa2.

Figure 5. Wikipedia articles views containing NMVW collection (top 7 languages)



Source: BaGLAMa2.

Table 1. Wikipedia views and articles (total and NMVW) in June 2015

Language	Total articles		NMVW articles	As % of NMVW	Total page views		NMVW page views	As % of NMVW
	(in millions)	% of total			(in millions)	% of total	(in thousands)	
English	4.9	14	1168	10	8266	51	4031947	62
German	1.8	5	431	4	1114	1	276339	4
Japanese	0.9	3	83	1	1326	8	120816	2
Spanish	1.1	3	115	1	1230	8	95850	1
French	1.6	5	614	5	776	5	413442	6
Dutch	1.8	5	866	8	190	1	211029	3
Indonesian	0.3	1	1910	17	115	1	928156	14
Total	35.4		11458		16296		6517768	

Source: adapted from <https://stats.wikimedia.org> and *BaGLAMa2*.

Table 2. Object view as function of exhibits and inclusion in Wikipedia articles

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	OLS	OLS	OLS
		Average		Average		Average
VARIABLES	Total views	Views/mo	Total views	Views/mo	Total views	Views/mo
Total months						
online	4,279*** (1,559)		6,488*** (2,011)		9,642*** (2,222)	
Total images	25,138** (11,653)	1,071** (491.7)	23,120 (15,333)	1,052*** (344.1)	57,176*** (11,144)	2,937** (1,427)
NMVW images	-42,865** (20,486)	-1,718** (751.5)	-43,363 (31,325)	-1,810** (709.8)	-27,464** (12,601)	-2,037* (1,081)
Total months					9,027	424.4
onsite	-26,625** (12,284)	-734.3** (369.5)	-5,546 (13,175)	-1,096 (820.3)		
Crowdsourced	-227,302** (104,507)	-5,937* (3,050)	56,139 (34,910)	1,783 (1,699)	136,402** (63,355)	7,693* (4,454)
Observations	140	140	131	131	131	131
R-squared	0.438	0.499	0.340	0.420	0.936	0.867
Language FE	Yes	Yes	Yes	Yes	Yes	Yes
Topic FE	Yes	Yes	Yes	Yes		
Type of object FE			Yes	Yes	Yes	Yes
Website FE					Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix (for online publication)

Table A.1 Object view as function of exhibits and inclusion in Wikipedia articles (all variables reported)

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	OLS	OLS	OLS
		Average		Average		Average
VARIABLES	Total views	Views/mo	Total views	Views/mo	Total views	Views/mo
Total months					9,642***	
online	4,279*** (1,559)		6,488*** (2,011)		(2,222)	
Total images	25,138** (11,653)	1,071** (491.7)	23,120 (15,333)	1,052*** (344.1)	57,176*** (11,144)	2,937** (1,427)
NMVW images	-42,865** (20,486)	-1,718** (751.5)	-43,363 (31,325)	-1,810** (709.8)	-27,464** (12,601)	-2,037* (1,081)
Total months					9,027	424.4
onsite	-26,625** (12,284)	-734.3** (369.5)	-5,546 (13,175)	-1,096 (820.3)	(25,325)	(480.2)
Crowdsourced	-227,302** (104,507)	-5,937* (3,050)	56,139 (34,910)	1,783 (1,699)	136,402** (63,355)	7,693* (4,454)
Language DE	405,883* (231,672)	22,881* (12,583)	255,539* (126,758)	23,956*** (2,242)	1.546e+06*** (401,085)	87,885** (41,917)
Language EN	607,538** (242,182)	24,551*** (9,102)	678,728* (360,164)	24,393*** (7,882)	1.646e+06*** (400,391)	73,626** (34,389)
Language ES	155,055 (243,188)	12,899 (11,283)	160,926 (141,747)	12,618*** (3,811)	1.556e+06*** (409,877)	76,551** (36,359)
Language FR	218,207 (324,295)	9,729 (12,411)	167,959 (280,788)	8,196 (8,931)	1.726e+06*** (426,058)	81,545** (38,751)
Language ID	491,018** (211,227)	19,058** (9,141)	548,627** (206,366)	19,250*** (4,132)	1.918e+06*** (482,599)	83,850** (40,023)
Language NL	421,684* (224,828)	18,678* (10,381)	349,274 (299,611)	17,135** (7,661)	1.796e+06*** (472,605)	80,811** (38,013)
Topic culture	24,894 (139,450)	-1,239 (5,328)	60,090 (110,084)	-1,283 (3,094)		
Topic geography	1.398e+06*** (387,462)	36,279*** (12,907)	1.219e+06** (429,342)	33,502*** (10,522)		
Topic history	229,137 (203,112)	1,265 (7,974)	-73,045 (185,234)	-3,403 (4,666)		
Topic sexuality	22,118 (182,646)	-4,987 (7,601)	46,804 (129,582)	-4,624 (3,436)		
Observations	140	140	131	131	131	131
R-squared	0.438	0.499	0.340	0.420	0.936	0.867
Type of object FE			Yes	Yes	Yes	Yes
Website FE					Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A.2 Full list of objects analyzed

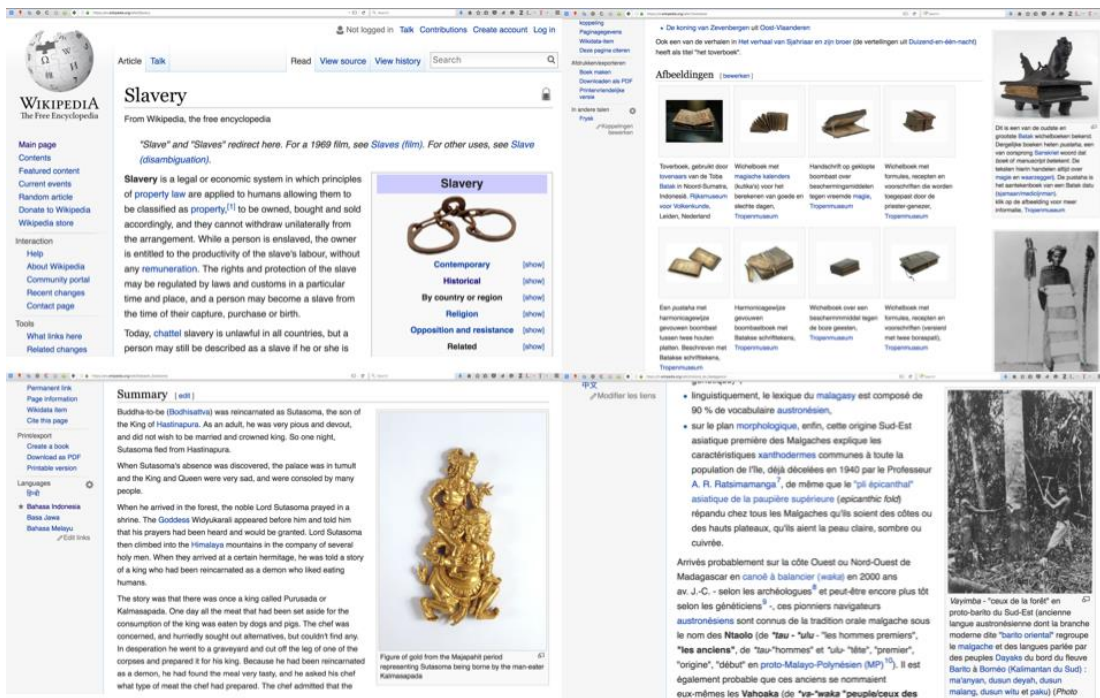
	Main article	Type of object	Date of First creation	First uploaded	First article	First lang.	Total # art.	Total # lang.	Object number
1	Kakawin Sutasoma	Gold piece	1295-1525	Jul-10	Oct-10	EN, FR	4	3	TMnr 2960-319
2	Pustaha	Wooden book	1852-1857	Jul-10	Dec-10	ID	6	5	TMnr A-1389
3	Singa	Magic horn	1852-1857	Jul-10	Jan-11	EN, DE	2	2	TMnr A-3932
4	Gong	Hanging gong	1939	Jul-10	Dec-11	NL	73	5	TMnr 1340-13
5	Slavery	Prison feet cuffs	1971	Jul-12	Aug-12	EN	348	4	TM-3912-475
6	Kris of Knaud	Photograph of Javanese Prince	1983	Nov-09	Mar-11	EN, NL	3	3	TMnr 10002783
7	Women in Morocco	Photograph of Berber woman	1940-1960	Jul-12	Feb-13	FR	7	5	TMnr 60033850
8	Gymnocrex	Photograph of Blue-faced rail	1949	Nov-09	Dec-09	JA	23	19	TMnr 10006477
9	Piercing	Photograph of two Kenyan Dayaks	1920	Nov-09	Dec-09	EN	12	8	TMnr 10005628
10	History of Madagascar	Photograph of men cutting tree in Borneo	1900-1940	Nov-09	Oct-11	FR	15	3	TMnr 60045266
11	Dayak people	photograph of house interior	1900-1930	Nov-09	Feb-10	EN	3	3	TMnr 10018343
12	Dayak people	photograph of Dayak	1920	Nov-09	Feb-15	EN	1	1	TMnr 10005510
13	Dayak people	photograph of longhouses	1894	Nov-09	Feb-15	EN	3	2	TMnr 60010391
14	Dayak people	photograph of Dayak performers	1898-1900	Nov-09	Feb-15	EN	2	2	TMnr 60001698
15	Dayak people	photograph of Dayak chief	1900-1940	Nov-09	Mar-10	EN	7	7	TMnr 60033041
16	Dayak people	photograph of Islamic Dayaks	1920	Nov-09	Feb-15	EN	4	2	TMnr 10005854
17	Dayak people	photograph of Dayak headhunters	1927	Nov-09	Mar-10	EN	8	7	TMnr 60034031
18	Dayak people	photograph of head of Dayaks in Borneo	1890-1920	Nov-09	Sep-11	EN	6	4	TMnr 60046407
19	Dayak people	photograph of child in front of grave	1900-1940	Nov-09	Aug-11	ID	2	1	TMnr 10017057
20	Principalities	photograph of Dutch governor and Sultan of Jakarta	1930-1940	Nov-09	Mar-11	NL	3	1	TMnr 60033564
21	Principalities	photograph of Islamic procession	1921-1926	Nov-09	Mar-11	NL	2	1	TMnr 10001876
22	Keris	photograph of man preparing pipe	1943	Nov-09	Feb-11	NL	2	1	TMnr 10005879
23	Keris	Oldest known kris	1342	Aug-09	Sep-09	NL	11	4	TM-6046-1
24	Keris	kris handle of god figure	1954	Aug-09	Oct-09	NL	3	3	TM-2322-13a
25	Keris	polychrome figure holding kris	1915	Jul-10	Nov-10	DE	1	1	TMnr 739-1
26	Keris	sitting Chinese figure	1915	Jul-10	Nov-10	DE	1	1	TMnr 1468-91
27	Keris	Kris handle Garuda	1940	Jul-10	Nov-10	DE	1	1	TMnr 1772-2340
28	Keris	kris handle made of fossil	1940	Jul-10	Nov-10	DE	1	1	TMnr 1772-919
29	Keris	kris handle with curved Garuda	1940	Jul-10	Nov-10	DE	1	1	TMnr 1772-428

30	Keris	Kris with head of demon with diamond eyes	1883	Jul-10	Nov-10	DE	3	3	TMnr H-6
31	Keris	kris handle curved	1940	Jul-10	Nov-10	DE	1	1	TMnr 1772-899
32	Keris	Kris handle with flowers	1940	Jul-10	Nov-10	DE	1	1	TMnr 1772-913
33	Keris	Kris Naga	1887	Jul-10	Nov-10	DE	1	1	TMnr A-5864
34	Keris	photograph of barong dancer	1910-1920	Nov-09	Jul-10	DE	0	0	TMnr 10022022
35	Keris	Kris handle with curved demon		Aug-09	Nov-10	DE	1	1	TM-1772-437
36	Keris	Keris sheath	1924	Jul-10	Mar-14	EN	1	1	TMnr 214-71
37	Keris	photograph of kris dancers	1971	Nov-09	Feb-10	EN	7	5	TMnr 20018470
38	Keris	photograph of kris and kris holder	1910-1930	Nov-09	Nov-10	ID	1	1	TMnr 10026839
39	Keris	kris and scabbard	26-Feb-09	Apr-09	Sep-10	ID	6	5	RV-360-8082
40	Slavery	Maroons art clay piece	1963	Sep-09	Oct-09	NL	1	1	TMnr 3325-73
41	Slavery	neck cuff	1959	Sep-09	Oct-09	NL	3	2	TMnr 2766-3
42	Slavery	slave stamp	1877	Sep-09	Oct-09	NL	2	1	TMnr H-2978
43	Slavery	slave release letter	1860	Sep-09	Oct-09	NL	2	2	TMnr 0-302
44	Slavery	video of emancipation in Paramaribo news	1963	Apr-11	Nov-11	NL	4	1	NIBG
45	Slavery	Dutch slavery emancipation law document	1862	Jan-14	Jan-14	NL	1	1	NA
46	History of Slavery	lithograph of slave funeral	1840-1850	Nov-09	Nov-09	EN	30	7	TMnr 3444-7
47	History of Slavery	Jan Mostaert: Portrait of an African Man	1525-1530	Jul-09	Dec-12	EN	27	7	Rijksmuseum
48	History of Suriname	Dirk Valkenburg: plantation	1707	Apr-08	Feb-15	NL	28	9	TMnr 3912-475
49	History of Suriname	photograph of Maroon woman	1946	Sep-09	Nov-09	ES	2	2	TMnr 10019385
50	History of Suriname	photograph of Brokopondo dam	1963	Sep-09	Nov-09	ES	10	6	TMnr 60044067
51	Gamelan	Bonang	1928	Jul-10	Jul-14	EN	2	2	TMnr 500-20
52	Gamelan	Gender	1928	Jul-10	Jul-14	EN	2	1	TMnr 500-4
53	Gamelan	Gong	1928	Jul-10	Jul-14	EN	2	2	TMnr 500-26a
54	Gamelan	Kendang	1928	Jul-10	Jul-14	EN	1	1	TMnr 500-7
55	Gamelan	Kenong	1928	Jul-10	Jul-14	EN	1	1	TMnr 500-21
56	Gamelan	Peking	1928	Jul-10	Jul-14	EN	1	1	TMnr 500-1
57	Gamelan	Saron	1928	Jul-10	Jul-14	EN	1	1	TMnr 500-11
58	Gamelan	Slenthem	1928	Jul-10	Jul-14	EN	2	2	TMnr 500-16
59	Gamelan	photograph of gamelan orchestra	1870-1891	Nov-09	Jan-01	EN	2	2	TMnr 60015940
60	Gamelan	photograph of young angluk players	1918	Nov-09	Jul-10	JA	4	4	TMnr 10017867
61	Gamelan	photograph of gamelan orchestra	1910-1930	Nov-09	Jul-10	JA	4	4	TMnr 10026902

62	Gamelan	photograph of rebab player	1945-1955	Nov-09	Jul-10	JA	17	11	TMnr 60052115
63	Gamelan	photograph of Balinese dancer Mario	1940	Nov-09	Jul-10	JA	8	5	TMnr 10004713
64	Gamelan	photograph of man playing ketuk	1966	Nov-09	Jul-10	JA	1	1	TMnr 20000380
65	Gamelan		1971	Nov-09	Jul-10	JA	1	1	TMnr 20000315
66	Gamelan	photograph of two Balinese dancers	1929	Dec-09	Jul-10	JA	40	13	TMnr 10004678b
67	Gamelan	photograph of Balinese dancer with gold crown	1952	Nov-09	Jul-10	JA	1	1	TMnr 10004733
68	Gamelan	photograph of gamelan orchestra in Bali	1920-1921	Nov-09	Jul-10	JA	1	1	TMnr 60008125
69	Gamelan	photograph of gamelan orchestra and dancers	1952	Nov-09	Jul-10	JA	1	1	TMnr 10004737
70	Gamelan	photograph of gamelan orchestra and dancers	1952	Nov-09	Jul-10	JA	1	1	TMnr 10004734
71	Gamelan	photograph of gamelan orchestra and kebyar dance	1952	Nov-09	Jul-10	JA	1	1	TMnr 10004738
72	Gamelan	photograph of two gamelan players	1900-1940	Nov-09	Jul-10	JA	1	1	TMnr 60030949
73	Gamelan	photograph of gamelan orchestra	1949	Nov-09	Jul-10	JA	1	1	TMnr 10003354
74	Angklung	photograph of school children in angklung orchestra	1971	Nov-09	Mar-10	ID	2	2	TMnr 20000366
75	Book of spells	photograph of Batak datu with book of spells	1900-1940	Nov-09	Jul-10	NL	7	2	TMnr 10016338
76	Book of spells	Magic text in Balinese	1969	Jul-10	Apr-15	NL	2	2	TMnr 3798-5
77	Book of spells	Book of spells decorated	1947	Jul-10	Apr-15	NL	1	1	TMnr 1754-1
78	Book of spells	Book of spells with protection against angry spirits	1921	Jul-10	Apr-15	NL	1	1	TMnr 137-567
79	Book of spells	Priest book	2001	Jul-10	Apr-15	NL	1	1	TMnr 5924-1
80	Book of spells	Priest book	2001	Jul-10	Apr-15	NL	2	1	TMnr 5924-2
80	Book of spells	Book of spells with recipes used by priests	1921	Jul-10	Apr-15	NL	1	1	TMnr 137-573
82	Book of spells	Book with protection against black magic	1935	Jul-10	Apr-15	NL	1	1	TMnr 990-1
83	Book of spells	Book of spells with calendar for good and bad days	1892	Jul-10	Apr-15	NL	2	1	TMnr 1322-162
84	Book of spells	Balinese manuscript about magic	1944	Jul-10	Apr-15	NL	1	1	TMnr 1646-35
85	Book of spells	Text about magic in Javan	1938	Jul-10	Apr-15	NL	1	1	TMnr 1221-2
86	Book of spells	Manuscript with 67 pages of magic text	1920	Jul-10	Apr-15	NL	1	1	TMnr A-4849a
87	Book of spells	Spell book in Arabic to predict life	1931	Jul-10	Apr-15	NL	1	1	TMnr 674-587
88	Pustaha	photograph of datu house	1900-1930	Nov-09	Aug-11	DE	1	1	TMnr 60028777
89	Pustaha	photograph of Batak priest	1939	Nov-09	Aug-11	DE	3	1	TMnr 10000926
90	Pupuk	jar for magical potions	1921	Jul-10	Aug-11	DE	1	1	TMnr 137-633
91	Pupuk	medicine jar	1914	Jul-10	Jan-11	DE	1	1	TMnr 2761-658a
92	Berber jewelry	Necklace with 5 Fatima hands	1940-1960	Jul-10	Feb-15	DE	3	3	TMnr 5070-2
93	Berber jewelry	Two silver pins	1900-1925	Jul-10	Feb-15	DE	1	1	TMnr 6387-2

94	Berber jewelry	silver earring with corals	1971	Jul-10	Feb-15	DE	1	1	TMnr 3957-4a
95	Berber jewelry	silver anklet	1969	Jul-10	Feb-15	DE	1	1	TMnr 3833-237a
96	Madagascar	engraving of village	1893	Jul-10	Oct-11	FR	19	5	TMnr 3219-14
97	Madagascar	lithograph of Dayak sarcophagus	1887	Jul-10	Oct-11	FR	5	3	TMnr 5795-29
98	Madagascar	photograph of Borobudur temple relief	1960-1980	Nov-09	Jun-13	FR	7	4	TMnr 20025669

Figure A.1 Examples of collections in Wikipedia articles



Source: Wikipedia pages about Slavery (English), Magical Books (Dutch), Kakawin (Indonesian), History of Madagascar (French).