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Managing hyper-frequentation of heritage sites: from a growing problem to undifferentiated and segmented responses segmented

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Abstract

In the current context of cultural fever (Benhamou, 2001), certain heritage facilities and sites are experiencing levels of visitor numbers which, beyond a certain threshold – whether objective or perceived – can be described as hyper-frequentation. The term, which is still rarely used in French museum tradition and in academia, covers very specific realities in at least four dimensions of the activity of museums, monuments and exhibition venues: free admission, major temporary exhibitions, high international tourist attendance and the "masterpiece" effect. The purpose of this article is to refine the diagnosis of the impact of crowds in cultural settings, the concept of hyper-frequentation, its human and organisational consequences, and its management.

Keywords

Hyper-frequentation, heritage, marketing, management, ethology.

Introduction

Visitor numbers are a generalised, imprecise and ambivalent concept. They are proof of the cultural sector's good health, but they are also a potential risk factor for heritage and a source of nuisance for users. Crowds have a particularly bad reputation among art lovers, as they are seen as distracting individuals from their special, intimate relationship with a work of art or heritage site. However, in our culture- and leisure-hungry society, crowds are an integral part of the cultural experience. They are therefore a particularly important variable for both researchers and cultural actors. Globalisation, growing demand, a hyper-choice of offerings, new leisure practices and new cultural genres are all factors that encourage us to understand how cultural practices are experienced in crowded settings. These various determinants of the success of museums and heritage sites raise a whole series of questions about the future of these facilities and how they will be managed.

In addition to seeking qualitative diversification, increasing visitor numbers is now a widely supported and encouraged objective for all cultural facilities and venues. The desired increases in visitor numbers are generic. A prime example is the Louvre Museum, which, despite being the world's most visited art museum in terms of annual visitor numbers (8.34 million visitors in 2006, up 11% on the previous year), continues to include in its policy the desire to open its doors to ever more visitors. The Louvre's 2006-2008 Performance Contract illustrates this ambition. The first priority of the Contract ("Improving accessibility for the public") is broken down into several strategic objectives, the first of which is entitled: "Continuing the museum's efforts to attract high visitor numbers". The recommendations are the same for monuments. Monum', the organisation responsible for managing France's national monuments, echoes these objectives, whether for superstars such as Mont Saint Michel (the most visited provincial monument in terms of annual visitor numbers, with 1,056,000 admissions in 2005) or more obscure sites. In most countries, visitor numbers are the subject of much debate, both in terms of the relevance of the indicator and the quality of its measurement. And the consequences of high visitor numbers are still little discussed by cultural professionals, both in terms of audience policies and concrete, long-term measures to remedy the most immediately visible and harmful effects of hyper-visitor numbers on the public, on the work of staff and on heritage.

These ambitions – which are justified by the dynamism of the cultural sector and a genuine broadening of audiences – often translate into recurring episodes of hyper-attendance in exhibition venues. These congestion phenomena, which are well known to the operational teams who experience them and the researchers who measure them, are still insufficiently studied from an academic point of view. With the continuous increase in overall visitor numbers – an increase that is both "independent", linked to the growth of tourism worldwide, and "dependent", linked to the dynamism of cultural policy and audiences for cultural facilities – this issue is becoming increasingly important and affects three priority areas: personal safety, the security of works, property and buildings, and the quality of the visitor experience. On this last point, taking into account the impact of visitor numbers on the visitor experience is all the more strategic as it has a significant impact on public satisfaction. Visitor satisfaction is now a key indicator of the performance of cultural venues.

This article first sets out the organisational, legal and behavioural context underlying the issue of hyper-frequented venues. It then goes on to identify the main management techniques, distinguishing them according to their logic of application. In the third part, two studies using methods based on observation and understanding of behaviour and experiences are presented. The aim is to highlight the methodologies that can be used for a comprehensive approach to attendance and

hyper-frequentation phenomena. Both studies have provided a more refined understanding of attendance and its impact on visitor behaviour. One of these studies focuses on a museum, the other on a monument. Finally, the fourth part highlights prospects for research and methodologies for analysing behaviour in crowded situations, while recalling the operational issues faced by cultural facilities subject to hyper-frequentation.

Part 1 - Hyper-frequentation: a growing issue for cultural and heritage site policy

1. Definitions

The term "hyper-frequentation" is rarely used in France, and there is little research on the subject in the cultural field. A definition is therefore necessary: **hyper-frequentation refers to a period of time during which a certain threshold of density is exceeded, thereby preventing a significant number of visitors from enjoying the site in good conditions and requiring increased attention to the safety of all visitors.**

The density threshold defining hyper-frequentation is a figure relating to the maximum number of individuals that a space can hold, whether it is a small room or a larger space, indoors or outdoors. Below this threshold, visitors can move around and use the cultural venue without being hindered by the presence of other individuals. Conversely, above this threshold, the behaviour of the majority of individuals is influenced by the behaviour and co-presence of other visitors. This presence of others, especially if it is perceived as uncomfortable, but also as soon as it is noticed (negative, neutral or positive perception of the crowd), leads individuals to adopt behavioural and/or psychological compensation strategies. In its extreme form, hyper-frequentation becomes "overcrowding". At this stage, capacity is so exceeded that there is a real danger. Visitor safety may no longer be guaranteed in the event of exceptional circumstances such as a fire alarm, someone feeling unwell and needing to be reached quickly and evacuated urgently, or any event requiring a large-scale and immediate evacuation of the premises. In situations of high visitor numbers, cultural objects (works of art, property, buildings or natural heritage) are also potentially at risk.

The situations associated with hyper-frequentation

Hyper-frequentation covers very specific realities in at least four areas of activity for museums, monuments and exhibition venues.

- The first concerns large facilities with **high international tourist numbers**, which are seeing an increase in overall visitor numbers due to the growth in international tourist arrivals and, correlatively, the tropism of travellers' movements (summer seasonal peaks and holiday periods well known to cultural and tourist operators).
- The second dimension relates to the situation of **cultural facilities** that are **wholly or partially free of charge**, where the increase in visitor numbers is directly induced by measures exempting them from admission fees. Anglo-Saxon literature, particularly British, addresses the issue of hyper-attendance under the term "congestion" and seeks to measure the economic impact and hidden costs of these policies of access for the greatest number (Maddison and Foster, 2003).
- The third concerns the public's enthusiasm for **major art exhibitions**, which can attract more visitors than the permanent collections of some institutions, creating imbalances that are detrimental to the missions, overall economy and functioning of these organisations. For example, the high visitor numbers seen at certain particularly attractive major exhibitions force professionals to put in place highly targeted crowd management measures to cope with daily peaks in attendance, often over very short periods, especially as exhibitions do not always have enough space to display the works and

welcoming an ever-growing audience.

- The fourth situation relates to what could be described as **the "masterpiece effect"**. Certain facilities hosting flagship works experience an imbalance in visitor flows and attendance at their museum spaces due to the exceptional appeal of one or more works.

2. Hyper-crowding in establishments: safety conditions and theoretical audience capacity To fully understand the issue of hyper-crowding and how to manage it, it is useful to remember that cultural and heritage sites are characterised by receiving an indeterminate number of visitors who move around freely while standing. In most cultural and heritage sites, unlike theatres or venues where the public is seated on existing, fixed furniture, it is impossible to have a capacity equivalent to the number of seats available. This uncertainty about the number of people that can be accommodated in spaces accessible to the public means that maximum theoretical thresholds, governed by law, must be defined in advance. In this case, this involves setting the number of individuals per square metre, determining the number and size of access points, and establishing conditions for movement based on the precise surface area and characteristics of the spaces concerned. For example, in the case of a temporary exhibition, this would include the density of the works on display and their configuration. Uncertainty about human volume also stems from the fact that each cultural facility has its own physical and organisational characteristics.

The thresholds – the theoretical capacity of the public – are determined and implemented taking into account the specific context of each facility or venue open to the public. This theoretical capacity is strictly regulated by a reference legislative framework (Box 1-a). For example, the Louvre Museum belongs to category Y and applies Article Y2 to calculate its theoretical capacity (Box 1-b): "the theoretical capacity is determined on the basis of one person per five square metres of floor space accessible to the public".

Box 1 - Standards for theoretical capacity in French museums

a- The theoretical capacity of museums in France is governed by the safety regulations against fire and panic risks in establishments open to the public (decree of 25 June 1980 and decree of 12 June 1995 approving provisions amending and supplementing the safety regulations against fire and panic risks in establishments open to the public).

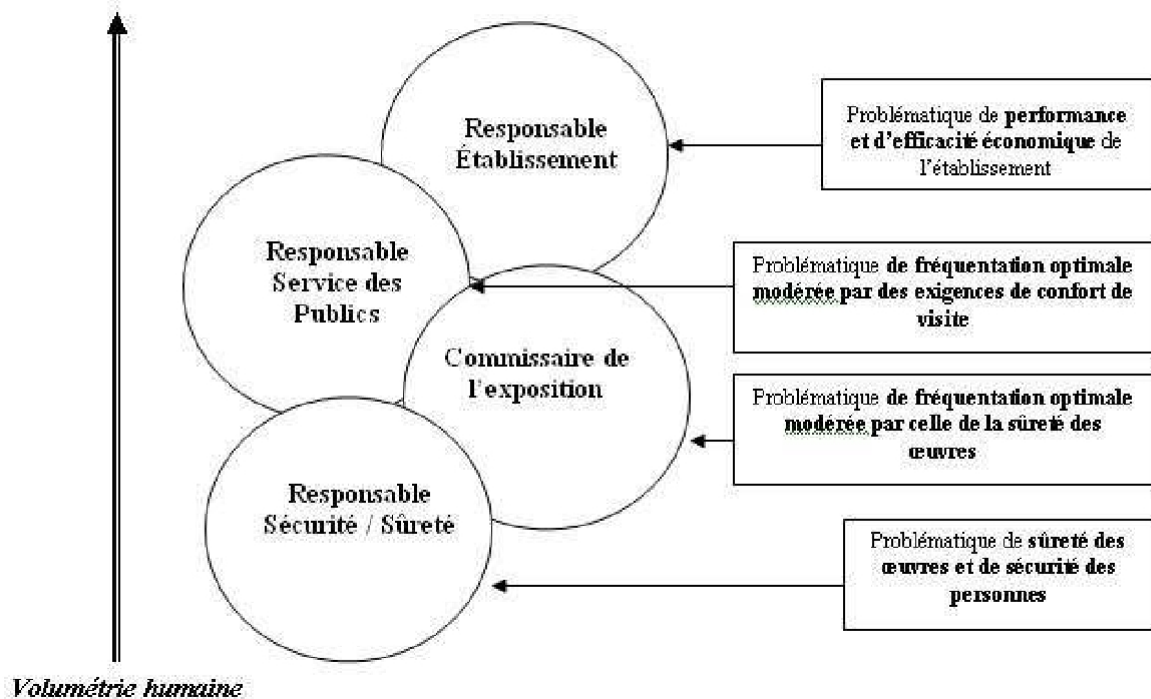
b- Type Y establishments: Museums and rooms intended to host cultural exhibitions (scientific, technical or artistic, etc.) of a temporary nature in which the total number of people admitted is greater than or equal to one of the following figures: 100 people in basements, 100 people on upper floors and other elevated structures, 200 people in total.

Article Y2, paragraph 2, specifies the conditions for derogation from this rule: "in museums of an evolving nature or in rooms that may be used for special exhibitions, the occupancy density may be higher, after consultation with the safety commission; in this case, a counting system must be installed so that the maximum number of people previously determined on the basis of the available clearance space is not exceeded. This density may also be reduced, under the same conditions, at the justified request of the project owner or the head of the establishment."

In the event of high visitor numbers, the theoretical capacity very quickly brings to the fore the different stakeholders' views on the maximum numbers to be allowed. And these views are sometimes contradictory: temporary exhibitions and the determination of their attendance thresholds are a good illustration of this (Figure 1). The exhibition curator expects high visitor numbers, which will be a guarantee of the exhibition's success. However, they are not prepared to reach a level of visitors that could pose a risk to the works on display. The security manager is in favour of a "safety" threshold that would allow them to evacuate one or all visitors as quickly as possible if necessary. The head of visitor services, on the other hand, wants to welcome as many people as possible.

possible number of visitors, in order to meet its audience development objectives, while prioritising good visiting conditions and therefore comfort (for example, it will insist on the provision of seats, which will ultimately be refused by the security manager, who will deem it impossible to evacuate the public quickly if such furniture is present). Finally, the head of the establishment will seek to achieve the best possible attendance figures in order to meet his cultural performance target, without forgetting the directly operational aspect of exhibition attendance: its contribution to admission revenue.

Figure 1 - Seuils de fréquentation dans le cas d'une exposition temporaire : logiques des acteurs culturels



Although the thresholds defined in accordance with safety and security standards for property and people take precedence over all other considerations, these thresholds are often the subject of discussion among professionals. It is rare for the determination of attendance thresholds or any exceptions to them to be acceptable to all stakeholders, let alone the public.

3. Hyper-attendance on the public side: adaptability, nuisance and dissatisfaction

While the target and measured thresholds vary among professionals, they also vary among the public. As soon as crowds are perceived as excessive, they have an impact on behaviour and the overall visitor experience. For example, a visitor will spend less time in front of a painting, abandon their plan to view a particular work or enter a room that seems too crowded, select a different work from the one they had planned to see, or switch from actively seeking information in the visitor area to a much more passive behaviour within the same space, etc. On a psychological level, social pressure exerted by the crowd can, for example, cause tension in visitors, which can impair their aesthetic attention or "cloud" their perception of their own feelings. This raises several questions: how do visitors adapt? What effects of discomfort and dissatisfaction do they experience? At what level of visitor numbers can we objectively consider, in the field, that

that there is a phenomenon of hyper-frequentation, both in terms of equipment and in terms of audience numbers?

While the issue of crowds and their impact on the cultural experience seems to be a recent concern in academic and professional circles, it would be misleading to think that this is a modern invention born out of the practices and perceptions of our contemporaries. Overcrowding has been part of the history of cultural practices since the emergence of taste for art and "cultural travel" in their modern form, dating back to the 18th century. Lord Byron, in his Italian journal written in 1821, already shed light on this feeling of mistrust among art lovers towards crowds, which were seen as an obstacle to the aesthetic experience. The influence of other visitors on the visitor experience, the impact of the number of people present on the expected enjoyment, and the role of companions and their expertise led Byron to adopt a deviant visiting strategy:

"I revisited the gallery in Florence, etc. [*Punctuation and spelling are as in the original manuscript.*] My first impressions were confirmed, but there were too many visitors for me to *get a proper feel* for anything. When we were (about thirty or forty of us) crowded into the Cabinet of Gems and Trinkets in a corner of one of the galleries, I said to Rogers that I felt like I was in a guardroom. I let him greet some of his acquaintances and went for a walk unescorted—the only few minutes I had to get a glimpse of the works around me. I don't mean to apply this to the examination I might make of them in private with Rogers, who has excellent taste and a deep feeling for the arts (in fact, more of both than I possess, for I have little of the former), but to the crowd of contemplative elbow-jammers who surrounded me. I heard a bold Briton declare to the woman hanging on his arm as they looked at Titian's Venus: "Hey, my goodness, that's beautiful" [...]

An essential consideration for analysing the impact of crowds on audiences is the close relationship between crowds and satisfaction. Taking this dimension into account is far from neutral for audience loyalty and their propensity to return or bring other visitors.

Part 2 - Managing hyper-visits: from management techniques to conceptual approaches

While it is impossible to completely control the number of visitors to a site or monument, a number of techniques can be used to improve, sometimes significantly, situations of hyper-visitation. After describing the two main families of techniques that exist, their differences in conceptual approach to visitation are outlined, paving the way for a third approach.

1. Techniques for managing hyper-visits: regulating and streamlining

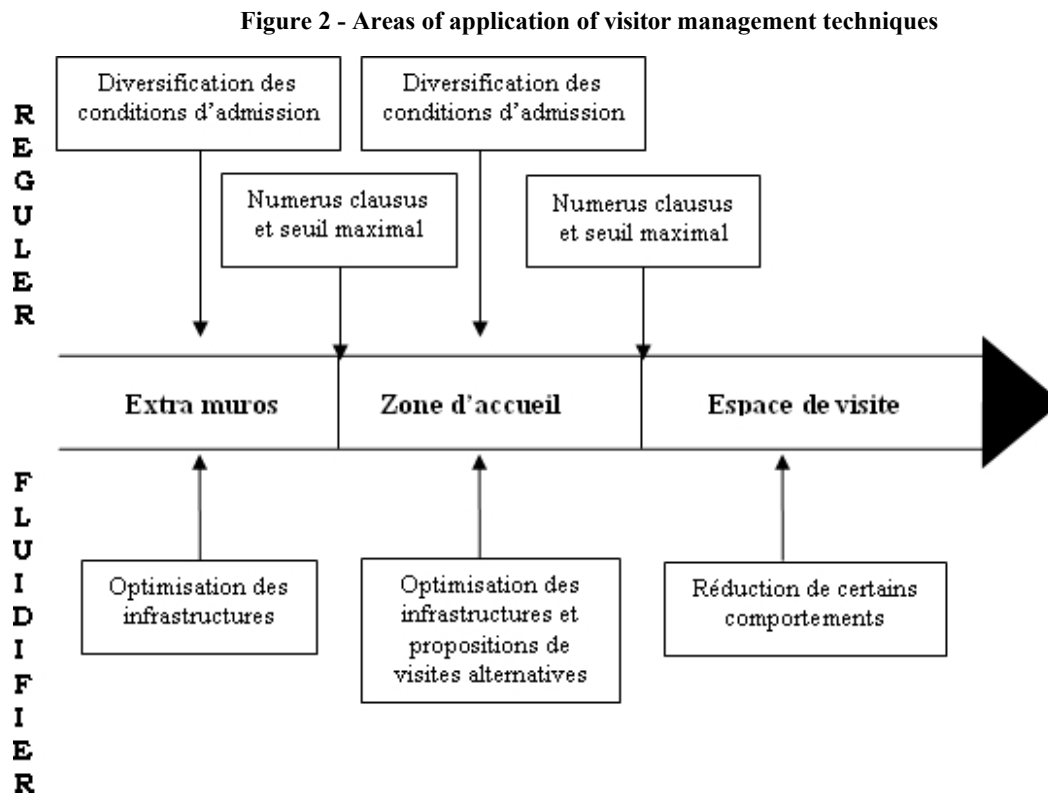
To manage high visitor numbers, techniques are used to either regulate visitor numbers or improve visitor flow. **To better control arrivals at the site and in a specific area of the site (regulation)**, there are two main techniques: introducing a numerus clausus or maximum threshold, and diversifying admission conditions. To achieve a better distribution of visitors and improve public behaviour at entrances and within the site (streamlining), three main techniques are used: optimising infrastructure through information, offering alternative visits outside and within the site, and reducing visitor behaviour that slows down flows. Table 1 describes these five techniques, stipulating their limitations and illustrating them.

Table 1 - Main techniques for managing high visitor numbers

I - REGULATE			
Techniques	Principles	Limitations	Illustrations
Introduction of a numerus clausus or maximum threshold	Control the number of visitors to a given location by enforcing a numerical density limit (numerus clausus) or a time limit on (threshold)	Longer waiting times Risk of visitors abandoning their visit Risk of access being refused (numerical threshold reached)	Introduction of a numerus clausus for the Tumulus de Gavrinis (Morbihan) Introduction of a maximum visitor threshold for a temporary exhibition
Diversification of admission conditions to sites	Implement an hourly and/or seasonal pricing policy Implement a total or partial reservation policy	The majority of visitors are not aware in advance and do not anticipate the conditions of access, opening hours and closing days.	More expensive admission fees at the Palace of Versailles in summer. Time slots imposed for visits to the Vatican Museums
II - STREAMLINE			
Techniques	Principles	Limitations	Illustrations
Optimisation of infrastructure through information and replication Access and opening hour	Provide information on traffic patterns and alternative internal or external access routes. Increase the number of access points and times. Divide reception areas.	Risk of the problem being passed on downstream once visitors are on site (checkouts, visitor areas).	Set up information points upstream of the site (at the edge of town, car parks, etc.) and secondary access points to be used to relieve congestion. Extend opening hours opening hours (e.g. evenings)
Propose alternative visits outside and on the site	Create alternative attractions to meet additional demands that are not really motivated by a desire to discover the site or to meet additional needs (leisure, a change of scenery, etc.)	Risk of refusal of these alternative itineraries (works considered essential)	Rare examples: Lascaux caves (preservation of the original)
Reduction in visitor behaviour that slow down visitor flow	Reducing the prevalence of behaviour that slow down the movement of other visitors and therefore the overall flow, by prescribing and/or imposing traffic rules and visiting.	Difficulty changing behaviours (harmless or, conversely, significant for the individual)	Prescribe a one-way traffic flow by displaying a no-entry sign. Strictly prohibit traffic in one direction by means of a turnstile. Prescribe or prohibit the taking of photographs and filming.

The practical application of management techniques: what, where and when?

In order to meet the needs of professionals, the main techniques used to manage high visitor numbers are shown in Figure 2, distinguishing between their areas of application (outside the walls, reception area, visitor area).



2. The rationale behind the application of techniques: 'undifferentiated' or 'simple differentiated'

To manage visitor numbers at a cultural venue, and more specifically situations that are inconvenient for visitors during periods of high visitor numbers, the techniques presented above can be applied according to two approaches that correspond to two different concepts of visitor flow.

In the first case, that of regulation techniques, **attendance is defined as the sum of all visitor behaviour**. The entire flow of visitors is seen as **a uniform whole, an indivisible unit**. Technical de gestion are then applied in a **logic "undifferentiated"**. This logistics-inspired approach makes it possible to act directly on the observable and sometimes extreme symptoms of overcrowding (for example, it has been proposed to regulate visitor numbers on the entire floor of the Louvre, including the room where *the Mona Lisa* is displayed). Thus, in the face of slowdowns and bottlenecks, whether proven or emerging, undifferentiated recommendations translate into concrete actions such as the temporary closure of rooms, the regulation of entry to the site, etc. Visitor management techniques are applied here to the entire audience of the cultural venue.

In the second case, that of fluidification techniques, **attendance is conceptualised as the sum of different flows, each characterised by one (or two) typical behaviour(s)**. The whole

The flow of visitors is seen as **a whole that can be differentiated on the basis of a major behavioural fact**. Examples include the flow of those who photograph the works and those who do not, the flow of those who are motivated to discover the venue, an exhibition, a room or a work and those who are not, or the flow of those who book and those who do not. In this concept of visitor numbers, management techniques are applied according to a **"simple differentiation" logic**. The aim is then to act on the symptoms but also upstream of slowdowns and bottlenecks. The recommendations are translated into concrete actions such as setting up a reserved area for people with poor eyesight in front of the *Mona Lisa*, offering alternative "visitor products" such as access to rooms and spaces not normally visited, or hourly pricing, etc. Visitor offerings are therefore designed to take into account the major differences in the ways people experience the site. This approach segments visitors based on typical behaviours in order to reduce the likelihood of overcrowding and, in some cases, avoid the need for crowd control measures that may be perceived negatively by the public.

3. A third conceptual approach to visitor numbers: the "marketing approach"

In order to consider other ways of improving flow, we need to conceptualise **attendance as the sum of different types of visits**. Once again, we need to view attendance as a divisible whole. However, unlike the logic of simple differentiation, other elements must be integrated in order to make this differentiation. Thus, we are no longer interested in one (or two) major behavioural fact(s), but **in the sequence and consistency of different behavioural facts, throughout all or part of the visit**. In this case, the entire flow of visitors is seen as the grouping together in the same place and at the same time of different visitor flows, each defined as an observable and explicit behavioural sequence with a particular discovery logic (Petr, 2002). In accordance with the rules of marketing segmentation, which require the identification of homogeneous and significant segments, the aim is to identify and differentiate the flow into a finite number of distinct visit modes.

A "complex differentiated" application logic

In this conception of visitor numbers, management techniques are applied using a **complex differentiated logic** that can be described as "marketing" due to the focus on the experience in progress. By focusing on the visitor experience and interpreting and/or questioning motivations and feelings, visitor flow segmentation is more complex than when based on a single behavioural fact.

This approach involves taking action before visitors arrive at the site or once they are there to provide them with the keys to using the site so that they can identify for themselves which types of signposted routes and which visit options would best suit the specific context of their visit (once, in the spirit of "encountering the monument", another time in a fun way with their children, etc.). The aim is, as far as possible, to prevent situations of excessive visitor numbers. In large art exhibitions and in areas housing masterpieces, where the attraction is very strong, this option is not sufficient or even efficient.

The specificity and efficiency of such a vision lies in its ability to convince visitors to identify themselves as consumers of a particular type of visit. The potential of the method therefore lies in the **communication prior to the visit, the off-site activities** (via the website, road signs, press relations, etc.) and the **definition of on-site signage**. On-site activities must build on prior communication activities (different coloured routes, audio guides with variable length speeches, with a duration chosen by the visitor or linked to a real-time measurement of the number of audio guides in use at the same time, etc.). The challenge therefore lies in clearly defining the communication channels **so that each visitor can select the option that suits them best and has the ability and desire to voluntarily remove themselves from the general flow** (crowd attraction). How can each visitor, as an individual atom in the general flow of

visitor flow, to find the directions and paths that suit their expectations (defined for each visit and possibly redefined during the visit, for example due to fatigue, etc.)?

Visitor offerings are therefore designed to take into account the major dualities in the ways of discovering the site. Visitors must then identify the offers that suit them, like an alternative route. If they choose not to follow this route, they accept the discomfort and constraints of high visitor numbers, just as when visitors accept a long wait to access a particular room or object.

To conclude this section on study techniques, Table 2 provides a critical assessment of the three ways in which visitor management techniques can be applied.

Table 2 - Critical assessment of the three application approaches

Approaches	Technical
Undifferentiated application	Regulation
Does not take into account visitor diversity but is effective at congestion points	
Differentiated application	Traffic flow
➤ Simple Not well suited to the diversity of visitor modes but fairly effective at congestion points	➤ logistics
➤ Complex Suitable for a variety of visiting patterns but not very effective at congestion points	➤ marketing

Part 3 - The methodological prerequisite for managing high visitor numbers: knowledge and understanding of visitor behaviour

The aim here is to use two types of comprehensive visitor studies, one ethological and the other semiotic, to show how professionals can optimise the application of current hyper-visitor management techniques according to the nature of the preliminary study they have carried out.

1. Studying visitor behaviour in a comprehensive manner

In order to determine which techniques for managing high visitor numbers should be prioritised and how they should be applied, managers **need qualitative information about the different types of visits**. Thus, in addition to traditional studies on visitor numbers (number of individuals, socio-demographic profiles, satisfaction levels, reasons for visiting, etc.), cultural site managers must have access to studies that adopt a "qualitative" view of visitor numbers. The term "qualitative" is used in the sense that it is not a question of measuring visitor numbers in a global and numerical way, defined as density and number of visitors, but of attempting to qualify them by identifying typical behaviours, visitor profiles and cultural experience patterns that make up and combine within the visitor numbers at exhibition venues.

The two studies presented here, one for a museum and the other for a monument, move from the individual's frame of reference to the frame of reference of the individual's experience. In line with Bourgeon-Renault's (2002) recommendations for studying cultural consumption behaviour, they take for granted the multiple and flexible nature of the behaviour patterns and consumption logic of heritage visitors (Petr, 2002). These two studies illustrate this methodological prerequisite for a comprehensive approach to visitor numbers in order to

subsequently manage extreme situations of hyper-visitation.

An ethological study of visitor behaviour in the room housing the Mona Lisa at the Louvre Museum

The study relating to the museum is an **ethological study** (a summary of the ethological approach is provided in Appendix 1). It combines behavioural analysis with a questionnaire survey of the same visitors within the museum (Surbled, 2005).

Choice of field

The Louvre Museum was of particular interest for the research on the issue of hyper-frequentation. It combines all four correlative situations of hyper-frequentation: hyper-tourism with seasonal peaks, hyper-visits to prestigious temporary exhibitions, hyper-visits on Sundays when admission is free for all visitors, and hyper-visits to one wing of the Louvre (the Denon wing), which houses three "icons" in the eyes of the public: the Mona Lisa, the Venus de Milo and the Winged Victory of Samothrace.

Methodology

Visitors were discreetly monitored using the "focal sampling" observation method (Altman, 1974), i.e. they were followed one by one throughout their visit to the room and their behaviour was recorded in the behavioural directory created for the study. This data, together with that collected from face-to-face questionnaires administered to the same visitors, was subjected to multifactorial and statistical analysis.

Main results

This study provided a detailed description of the influence of visitor numbers in one of the rooms (Salle des États) on various behavioural items and levels of visitor satisfaction and discomfort.

Among the most important results for the issue of managing high visitor numbers, the following three are worth mentioning:

- 30% of observers of the Mona Lisa are satisfied with viewing it for no longer than 20 seconds. These visitors, who are satisfied with a brief viewing of the work, spend an average of 1 minute and 56 seconds in the

- "Mona Lisa group" (a group of visitors located in the immediate vicinity of the painting and standing less than 50 cm apart);

- Human flow management (in situations of very high visitor numbers, visitors standing in front of the Mona Lisa are asked by security staff to make way for the next visitors) significantly improves the flow of visitors entering the room but leads to dissatisfaction among some visitors regarding the length of time they can spend viewing the work;

- This human flow management improves the flow of visitors entering the room, but does not reduce the difficulty for visitors to leave the "Mona Lisa group" when they want to leave the room.

Recommendations

Proposal to set up two types of viewing areas for the Mona Lisa, depending on the type of visit, to limit congestion and improve visiting conditions. A narrow corridor-shaped area to reduce the column of visitors and thus facilitate exit from the "Mona Lisa group" - indicated by signs indicating a limited viewing time in this corridor - is intended for visitors who wish to view the painting for less than 20 seconds ("discovery" mode). It is believed that informing visitors at the entrance to the corridor that their viewing time will be short will reduce the number of visitors dissatisfied with this time during crowd management. The other area corresponds to the rest of the Mona Lisa viewing area, where visitors are free to view the painting for as long as they wish (contemplation mode).

"contemplation" mode).

A semiotic study of visitor flows around the Alignements de Carnac Historic Monument

The study on the Monument takes a **marketing-inspired approach**, as it is based on a segmented analysis using a semiotic typology of consumer behaviour (Petr, 2002), and then reports the results of a questionnaire survey on variables

distinguishing between different modes of visiting the monument (National Site of the Carnac Alignments, France).

Choice of field

The Carnac Alignments Monument is again of particular interest in terms of hyper-frequentation, as it experiences three correlated situations of hyper-frequentation: hyper-tourist frequentation with seasonal peaks, hyper-frequentation due to permanent free visual access (no access to the object itself, as it is fenced off for conservation reasons) and access to the reception and museum information areas (for the Kermario space), and its "iconic" value (the megalith as a symbol of prehistory and Celtic heritage). At the same time, as this monument is located in a natural area, it also has specific vulnerabilities that make it particularly sensitive to the issue of excessive visitor numbers.

Method

Visitors were discreetly monitored one by one, behavioural information was recorded and then transcribed graphically (on a site map) and in narrative form. The data was subjected to a semiotic interpretation of the behaviours observed and transcribed (Petr, 2002).

Main results

This study enabled an analysis of the ways in which people visit a monument. Based on research into major behavioural contrasts (distinctive routes and behaviour in the strict sense), a typology of consumption patterns in a heritage space was drawn up and subjected to semiotic interpretation in order to understand the underlying meaning and driving force behind each way of discovering the heritage site. The questionnaire phase was carried out the following year with visitors to the same sites to identify the individual, situational and propositional variables (visit or not, show or not, awareness of the monument, architecture of the reception buildings, etc.) that influence the choice of one mode of visit over another.

Recommendations

These results made it possible to suggest a marketing mix tailored to each type of visitor behaviour. This marketing mix for the monument includes the promotion of differentiated visit options and specific communication channels, highlighting different ways of experiencing the monument (Petr, 1998).

2. Segmenting visitor behaviour: a unifying concern

The two studies presented above aim to **propose a segmentation of visitor numbers**. This is seen as a divisible whole, which managers can then apply in a "simple differentiated" or "complex differentiated" application. Both applications have in common the distinction, within total attendance, **of segments that are homogeneous in terms of behaviour within the venue**: length of visit, choice of route, proximity or distance from the works, time spent observing the works, relationships with other visitors and members of their family or group of friends, disruptive behaviour, reading of labels, slow or fast pace, thoroughness or brevity of the visit, etc. It is only at a later stage, and based on this distinctive knowledge, that actions are proposed and implemented.

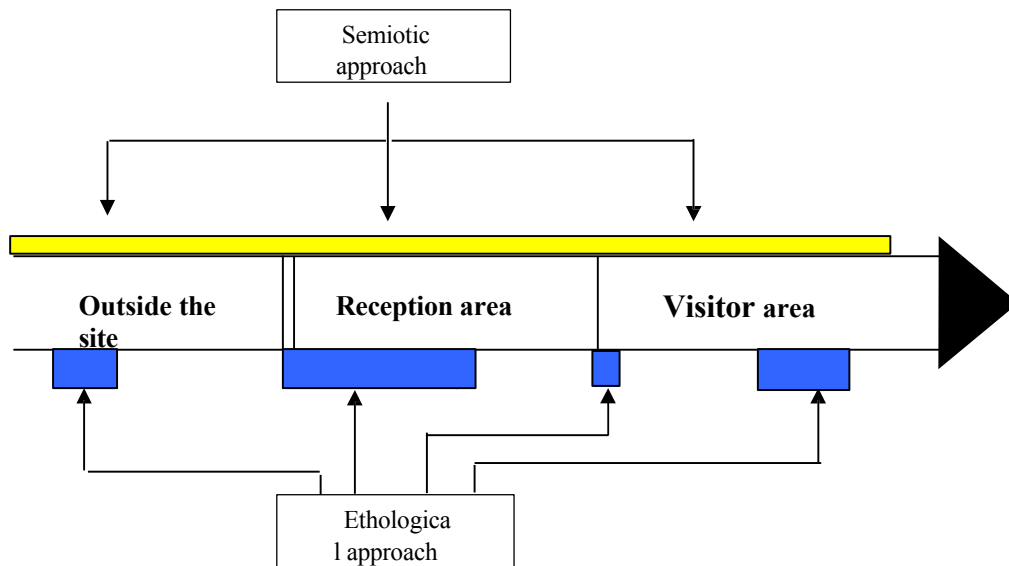
3. Different methods of application

However, although both studies use a segmented approach, the first, the ethological study, is sectoral, curative and multifunctional, while the second, the semiotic study, is global, preventive and single-functional. Thus, for managers who wish to invest in both curative and preventive objectives, the ideal would be to duplicate the studies in order to carry out the two methodologies in parallel, as shown in Figure 3, where the locations, times and scope of data collection for each of these methodologies are clearly distinguished.

However, as budgetary constraints rarely allow for such a comprehensive overview, it is also necessary to assess these methodologies so that professionals can choose the approach that is best suited to the characteristics of the hyper-frequentation phenomenon(s) present in their establishment.

best suited to the characteristics of the hyper-frequentation phenomenon(s) present in their establishment. From this perspective, we can see that semiotic analysis can guide preventive measures against overcrowding by providing managers with tools to level visitor demand, while ethological analysis favours the implementation and testing of more curative measures, as these mainly involve dealing with proven levels of visitor numbers and levelling visitor numbers across a visitor area. Thus, as shown in Figure 3, the semiotic approach focuses on behaviour throughout the entire visitor area, as visualised by the yellow band extending across this space. When this overall view focuses on behaviour in the reception areas and prior to entry (extra muros), it is again extensive, i.e. it can observe behaviour from the moment the intention to visit is formed (consulting the Internet at home, road signs 10 km from the site, leaflets read at the tourist office in a neighbouring town, etc.) until the visitor leaves the site. The ethological approach, on the other hand, is more sector-specific in the sense that the more intensive investigation of behaviour focuses on certain areas of the visitor site or areas prior to entering the site (as shown by the varying lengths of the blue squares in Figure 3). However, it can be carried out across the entire visitor area if it is smaller in size.

Figure 3: Investigation sites and effective areas of comprehensive management techniques



The ethological approach: sectoral, curative and multifunctional

The ethological approach (Museum study) incorporates the segmented approach by seeking to understand visitor patterns in a specific area of the site (reception area, temporary exhibition, room, in front of a work). It is therefore sectoral in terms of visitor flow management. Due to its spatially concise action, it is not designed to act upstream of the flow. It therefore has moderate preventive potential (although this is possible, such as when defining a threshold in a temporary exhibition) but is more effective in curative situations. In studying a phenomenon of hyper-visitation, the results of an ethological approach will make it possible to choose from the range of management techniques listed in this article which one(s) is (are) the most effective (verification by testing), based on their qualities and limitations, to solve the problem encountered.

The semiotic approach: comprehensive, preventive and single-functional

The semiotic approach (Monument study), by focusing its investigation on the underlying drivers and elements of meaning behind the act of visiting, provides a detailed understanding of visitor patterns throughout the visitor space. It is therefore considered comprehensive from a visitor flow management perspective.

It allows each informed visitor to choose whether or not to avoid crowded areas within the visitor space. Its purpose is therefore not fundamentally to address the phenomenon of overcrowding (an approach that is not very effective in large art exhibitions and in front of masterpieces), but to allow visitors to avoid crowded areas as much as possible. From this point of view, it is a preventive approach. It is single-purpose in the sense that it only implements techniques related to marketing fluidity. It is up to the manager to combine the marketing conclusions of this approach with other management techniques (logistical regulation and fluidity).

Part 4 - Management and research issues relating to hyper-crowding when the entire system is affected

Comprehensive methodologies for describing and analysing hyper-frequency situations and management techniques aimed at resolving or mitigating them are valuable tools for cultural organisations. Their practical application is all the more urgent given that hyper-frequentation has an impact on the entire cultural site, both in material and human terms. In this final section, the article discusses the organisational consequences of hyper-frequentation, the difficulties inherent in implementing management techniques and avenues for further research to prolong and enrich the debate on this topic.

1. The effects of hyper-frequentation: from cultural actors to audiences, a system affected in its entirety

From the perspective of cultural organisations, the debate on the high attendance rates of facilities and how they are managed is marked by ambivalence about their success and its "cost". For a cultural facility and its stakeholders, attendance has a positive side, which stems, on the one hand, from the idea that the cultural performance of a facility is measured by its attendance levels and, on the other hand, from the fact that attendance, sometimes very significantly, boosts the facility's own resources. High attendance makes performance "visible" and has a direct impact on the economic vitality of the cultural venue. On the negative side, hyper-attendance very quickly raises questions about the safety of people, the security of works and buildings, and their preservation: the very survival of the works and even of the cultural site as a whole is at stake. But hyper-attendance also raises the question of working conditions for staff, whose hardship in crowded situations is still too little addressed by research, even though it has a direct and long-term impact on the quality of work and the reception of the public. In situations of high visitor numbers, it is the entire organisational system that will be affected and will need to adapt its activities to provide effective management solutions.

From the perspective of cultural audiences, research is also lacking. Several qualitative and quantitative surveys conducted by the Louvre shed direct or indirect light on the impact of visitor numbers on visits and the attractiveness of a cultural site: visitors' intentions to visit the museum at certain times of the day to avoid crowds (CREDOC, 2003), significant interest in visiting collections at night in order to enjoy more pleasant visiting conditions, or even acceptance of higher admission prices in exchange for more favourable visiting conditions. Some of these studies also report the reluctance of some of the people surveyed to visit the museum because of its image as an overly crowded place (ARCMC/ISL, 2005). Logically, high visitor numbers can lead to people giving up visiting museums, a phenomenon that has been little addressed in studies on

culture audiences. Among the issues that deserve further research are understanding in detail how visitors perceive and experience their visit depending on the level of crowds, measuring what they are willing to accept, under what conditions, and with what consequences for the benefits of their visit and their satisfaction (Apostolakis and Jaffry, 2005).. While taking a step back from the visiting habits of art lovers, it is important to bear in mind that crowds are "the first degree of social aggregation" (Tarde, 1901). Crowds can be seen as attractive as a social manifestation of mental cohesion, or even as a spectacle in themselves. In other words, we need to continue to reflect on the impact of hyper-frequentation in the psychological, perceptual and behavioural dimensions that may be associated with it: what is the "price" of crowds? What do visitors and cultural facilities lose when crowds are perceived as being too large? Is this feeling the same for all visitors, in all circumstances and in all cultural venues? Conversely, when crowds are objectively smaller or perceived as acceptable, are visitors more active, more inclined to learn and interact with their peers, more likely to return and happier?

2. The applicability of hyper-crowding management techniques

In most cases, the techniques used to manage hyper-crowding produce satisfactory results. However, ideal solutions can be difficult to implement when faced with the realities on the ground. Faced with the expectations and behaviour of visitors who are difficult to convince and staff who are unable to carry out this public education or enforcement work on their own, the application of hyper-frequency management techniques becomes a problem of applicability, highlighting that the cure sometimes leads to other problems.

Thus, the introduction of a fluidification technique can lead to complex management solutions. In the example of a facility that opts to ban photography of the works (a solution that is currently being adopted by several major museums) in order to improve flow management (since visitors who do not take photographs tend to spend less time in the exhibition hall), the manager will need to consider, well in advance, all the direct and indirect consequences for the public, for the work of staff and also for the image of the facility. While a ban may significantly improve visitor flow, it runs counter to visitors' habits in an environment where images have become dominant and cameras have become increasingly numerous and technologically advanced (banning cameras does not prevent people from taking photos with their phones). Photography is closely linked to tourism and cultural consumption as a marker, trace and testimony of the experience. A measure of this nature requires a highly effective information system, whether in the form of written information provided in advance and on site, or verbal information provided by staff to visitors (which can significantly change the content of staff's work). Prohibiting photography also conflicts with the value of "cultural common good" and can give the public the impression that it is a commercial measure, even if the aim is to improve the visitor experience. Finally, the measure requires consideration of how to symbolically compensate for this "loss" by offering alternative solutions (access to images on a website, for example). Some museums even suggest charging a photography fee.

- sometimes symbolic - to make visitors feel responsible. So, while this solution is effective in terms of management, it doesn't solve the dissatisfaction or even frustration of some visitors, and the tension that can come with that if visitors don't accept these rules. An undifferentiated technique can then reach its limit when it produces side effects that are harder to solve than the problem it's supposed to fix.

3. Main areas for further research

All of the above developments raise a number of questions for cultural managers. These questions, summarised in Box 2 in the form of research areas, are detailed below, listing the various issues that managers regularly have to deal with.

Box 2 - Main areas of research on hyper-frequentation

Area 1 - Identifying hyper-frequentation

Collectively define thresholds, taking into account the constraints of the facility and the experience of the audience.

Axis 2 - Situational fluctuations (spatial and temporal) in hyper-frequenting thresholds Modulate thresholds according to the specific visitor numbers for each facility, at each time and in each space. Identify the conditions (individual, situational and propositional variables) that make hyper-frequentation more or less acceptable to visitors.

Axis 3 - Involvement of visitors in the hyper-frequency management system: Involve visitors by informing and educating them about the facility's constraints. **Axis 4 - Tools for measuring and controlling hyper-frequency:**

Design and provide counting or self-assessment tools to measure and control visitor numbers.

Axis 1. At what percentage of people expressing discomfort, behaviourally and/or verbally, is hyper-frequentation considered to have occurred? Who establishes this ratio? What operational variations will the facility adopt for its implementation?

Axis 2. What about the validity of these thresholds over the course of the year and variations in audience numbers? Is this percentage valid in all reception situations? Are there not certain configurations, or even cultural offerings or specific times, when visitors are more willing to put up with higher visitor numbers? Therefore, if the threshold is set based on the audience and their feelings, and the composition of the audience is not the same throughout the year, the value of the threshold is inherently variable according to different criteria. For example, isn't the threshold applied in the case of a temporary exhibition or on a free Sunday higher than on other days? Similarly, isn't the threshold higher, for example, when a room reopens after renovation or during the last few days of a temporary exhibition?

Given this volatility in attendance thresholds, how wide are the variations? How should and can professionals adapt to this multiplicity of thresholds? Analysing visitor behaviour is therefore all the more important given that threshold levels and their acceptability to audiences are, by their very nature, variable, uneven and heterogeneous.

Axis 3. What managerial response should be provided to a visitor who is determined to see one of the "icons" of the cultural venue? Should we make him wait until the room empties a little and impose a wait on him, or should we let him in after warning him that he will not have good visiting conditions? What would he prefer: the discomfort and frustration of waiting, or the discomfort and frustration of a visit in poor conditions?

In this situation, the first option is strict management, which does not take into account individual visiting habits but allows for effective control and is ultimately quite simple for the establishment. The second option is advisory management: visitors are informed of the visiting conditions and, as responsible individuals, they make the choice that suits them best. If they decide not to visit, they are informed of more suitable time slots or other options available to them (locations, routes, works, etc.).

While advisory management is more applicable in cases of reasonable visitor numbers and strict management is the only option when the number of people affected is too high, psychological research on the "locus of control" nevertheless highlights the value of involving visitors. This work, which demonstrates how important it is for individuals to be actors in the situations they experience, paves the way for more detailed analyses of the individual variables that may explain different visitor management methods depending on the visitors.

Axis 4: How can agents recognise these different thresholds, as well as the various variables that modulate them, in a simple, practical, concrete and objective manner? How can these threshold observations, whether exceeded or not, be used simply and quickly to implement the various applications and solutions that arise from them in a "just-in-time" manner, in line with visitor management principles? For example, counting visitors in representative areas can help estimate visitor numbers at other points on the site; certain locations can also serve as physical reference points for triggering the management and coordination of surveillance teams, as well as for studying the public and their visiting behaviour.

Conclusion

More and more museums and monuments are facing the phenomenon of hyper-frequentation of their structures. With cultural venue policies and economics favouring increased visitor numbers, the repercussions of hyper-frequentation require visitor flow management strategies that integrate the threefold objectives of personal safety, security of the works and their preservation.

The purpose of this article was not to explain the factors behind this high attendance, but to consider ways of curbing this phenomenon, whether through undifferentiated or differentiated, simple or complex measures. The discussion highlighted the potential of this qualitative approach to visitor numbers and, above all, of a segmented vision of the application of techniques, which could be described as a "marketing breakthrough", as a tool for optimising the management of hyper-frequentation situations.

More generally, it was possible to highlight how the concept of visitor numbers remains vague and fluctuating from the visitors' point of view, whereas it can be clearly objectified from the establishment's point of view. This raises a number of research questions that professionals and academics need to address in order to improve the management of hyper-crowding situations.

Finally, in terms of perspectives on the study of visitor behaviour, it seems important to highlight the potential of ethological approaches as a comprehensive tool for investigating cultural experiences. Apart from a few rare cases such as Hilke (1989), studies that rely solely on ethological tools are extremely rare in the museum sector. This is mainly due to the limited knowledge of how this young discipline can be applied to museums, the museum habitus of mainly using mentalist approaches, and the epistemological limitations of the ethological tool (observation must be combined with a survey). However, as we have seen, this comprehensive approach has great potential for understanding how the visitor experience is lived, both in general and under conditions of high visitor numbers. Indeed,

"entering" into the human mind through behaviour, through the expression of human beings in their environment, opens up the field of explanation to multiple determinisms. In the museum context, this approach can thus answer the various questions of professionals and, through knowledge of "doing", to envisage concrete applications. Drawing inspiration from Georges Balandier (2003) on the practice of anthropology, we conclude, however, that we must always bear in mind that the way museum professionals view visitors cannot be separated from the way they view themselves, their way of participating and producing, through the museum institution, this changing world.

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Appendices

Appendix 1 - The human ethology approach

Human ethology is **the science that studies human behaviour in its environment in order to understand individual-environment interactions**. Human ethology, according to Boris Cyrulnik (2001, p. 62), "defends the idea that behavioural manifestations result from the confluence of various determinisms of different natures". Behaviour is seen as the expression of the human being as a whole, not just as body movement but as a manifestation resulting as much from the body as from the psyche. Edgar Morin, whose work aims to establish a unified and detailed knowledge of humankind, writes that "there is in all human behaviour [...] a genetic component, a cerebral component, a mental component, a subjective component, a cultural component and a social component" (Morin, 2001, p. 47).

In the context of visitor experiences, the ethological view of humans proposes **to understand visitors to exhibition spaces in their entirety and diversity**, without mentalist or materialist *preconceptions* and without culturalist or naturalist *preconceptions*. This way of thinking about humans therefore invites us to use the diversity of methods and tools available to study humans, while challenging the epistemological and methodological difficulties that this entails.

The ethological tool

Using randomised sampling and statistical analysis, often multifactorial, the discipline of ethology is distinguished by its method based on **planned and quantitative observation**.

Using various observation methods (Altman, 1974; Diamond, 1999), researchers collect results that are representative of all visitors during the study period. Ethological science contributes by **accurately describing visitor behaviour, what they do** (and not just what they say they do), and **by analysing the prevalence of behavioural and environmental factors that explain this behaviour**. In a second stage, the effectiveness of the proposed solutions or developments is tested.