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Digital Maturity Assessment for Performing Arts Organizations.

The experience of Italian Theaters

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Abstract (Italian Version)

Il teatro è, fin dall'antichità, un luogo centrale per la diffusione della cultura.

Recentemente, però, si è reso sempre più necessario un ripensamento del modello di business dei teatri, per garantire la loro sopravvivenza. Infatti, nemmeno nel settore cultura è più possibile prescindere dalle nuove tecnologie digitali che stanno radicalmente trasformando ogni attività. Questo fenomeno, poi, è stato reso ancora più evidente dall'avvento del Covid19 e dalle conseguenti chiusure forzate durante i periodi di lockdown.

Tuttavia, nonostante sia diventato ormai essenziale abbracciare l'evoluzione digitale anche all'interno della gestione organizzativa dei teatri, questo tema non è mai stato sufficientemente discusso.

L'obiettivo di questa tesi è allora proprio quello di trattare l'argomento, proponendo un modello che vada a misurare il livello di maturità digitale all'interno dei teatri italiani.

Sono state individuate le variabili rilevanti da indagare e per raccogliere i dati e calcolare l'indice è stata somministrata una survey a quattro categorie di teatri riceventi il contributo del Fondo Unico per lo Spettacolo (Teatri Nazionali, Teatri di Rilevante Interesse Culturale, Teatri di Tradizione e Fondazioni Lirico Sinfoniche).

L'analisi ha così permesso di valutare l'effettiva diffusione tecnologica e il livello di digitalizzazione medio di queste istituzioni culturali nel territorio nazionale, classificandole di conseguenza.

Il modello proposto è anche uno strumento utile per confrontarsi con altre realtà teatrali, per capire se e in quali ambiti sono necessari investimenti specifici e per valutare attentamente le strategie future. Inoltre, adattandolo opportunatamente, il modello può essere applicato anche in altri Paesi, e può quindi diventare rilevante anche nel panorama internazionale.

Abstract (English Version)

Theater has been a central place for the dissemination of culture since ancient times.

Recently, however, it has become increasingly necessary to rethink the business model of theaters in order to ensure their survival. In fact, even in the culture sector it is no longer possible to ignore the new digital technologies that are radically transforming every activity. This phenomenon, then, has been made even more evident by the advent of Covid19 and the resulting forced closures during lockdown periods.

However, although it has now become essential to embrace digital evolution even within the organizational management of theaters, this issue has never been sufficiently discussed.

The aim of this thesis, then, is precisely to address this topic by proposing a model to measure the level of digital maturity within Italian theaters.

Relevant variables to be investigated were identified, and to collect the data and calculate the index, a survey was administered to four categories of theaters receiving contributions from the Fondo Unico per lo Spettacolo (National Theaters, Theaters of Significant Cultural Interest, Tradition Theaters and Lyric Symphony Foundations).

The analysis thus made it possible to assess the actual technological diffusion and the average level of digitization of these cultural institutions in the Italian territory.

The proposed model is also a useful tool to benchmark different theaters, to understand if and in which areas specific investments are needed and to carefully evaluate future strategies. Moreover, by adapting it appropriately, the model can also be applied in other countries, and can thus become relevant in the international arena as well.

Executive Summary

The relationship between theater, advanced technological solutions and the measurement of its digital performances is the core topic of this Master Thesis.

The theater, understood as a complex organization of people and means, has the typical connotation of a social institution operating in the economic sphere. It can be defined as a coordinated system of personal and material resources, organized in accordance with laws and procedures both internal and external to the organization (Nova, 2002).

Theater is aimed at the pursuit of specific objectives, which can be summarized into three main categories:

- Social-Artistic objectives, which are related to the creation of artistic production and to the protection of cultural heritage to create externalities and added value for the community.
- Economic objectives, which are linked to compliance with rules of economic management such as administration and organizational efficiency and effectiveness.
- Competitive goals, which are related to the survival in the marketplace.

This last category of goals has acquired particular importance during last years, thanks to the development of new technologies which has been making the digitalization and innovation rate of theaters a critical successful factor.

Of course, a valid organizational structure is essential for the proper functioning of a theater, and it plays a key role in the achievement of these goals. For this reason, it is necessary to develop a unified model that allows for positive, bidirectional relationships among institution's main goals. The organization, indeed, must be able to fully support the offer of the show if it wants to effectively pursue these objectives (Foglio, 2005).

Alongside with this necessary comprehensive view of the theater as a structured organization, it is relevant to consider that, from creation to consumption, all steps in the theaters value chains have been influenced by new digital solutions. They have brought about new opportunities for innovative practices and new ways of interaction with audiences (De Voldere, et al., 2017).

This phenomenon of growing fascination with technological instruments has been strongly increasing from the 60s till today, and it has become even more urgent following the Covid-19 pandemic and the consequent lockdowns. Indeed, between 2019 and 2020 there was a reduction in admissions of 70.41 percent and an estimated loss on box office expenditures in the Italian theatrical scene of 77.78 percent. This translated in millions of losses for this sector, which highlights the importance of digitalization for increasing the resiliency against such disruptive events bringing to new opportunities and necessary digital implementations such as the Online Streaming.

The advent of Covid19 and the restrictive measures designed to curb it, therefore, have forced theaters to take a hard look at the potential and importance of incorporating digital technologies into every stage of theater management and organization.

In addition to a new way of thinking about the delivery and production of performances, in fact, in the last two years it has also become increasingly urgent to rethink all those back-office activities, which managed in a traditional way and without the help of advanced technological tools, do not allow them to remain economically viable in the market. Therefore, in addition to offering the theatrical product in an alternative way, reorganizing itself through online streaming, for example, which have assumed a key strategic role, theaters must increasingly figure out how to incorporate digital technologies fully into their organization, making the processes of logistics, security, personnel management, and strategic and investment planning digital and flexible.

We can therefore say that this pandemic has in some ways represented a valuable opportunity to unhinge somewhat antiquated logics that theaters do not need digital to remain competitive and has given a strong push toward viewing the theater organization as 360-degree digital.

Digitization, therefore, needs to be carefully studied to understand what new benefits and challenges it can bring at the creative level, at the production level, at the distribution level, at the marketing level, and even at the managerial level.

In literature, we can find different papers and research aimed at analyzing the impact and the benefits that some digital solutions could bring in specific areas of the organization (Borelli, 2013); (Agostino, Arnaboldi, & Calissano, 2019); (Preece & Johnson, 2011) (Carpentieri, 2020); (Gilleri, 2008); (Gallina, Organizzare teatro, 2007); (Lennox & Mason, 2022); (Monteverdi, 2013); (Carver

& White, 2013). Innovation, indeed, is one of the critical successful factors for every theater both for what concerns the on-stage activities and the customer involvement but also within the organization to achieve a competitive advantage in managerial and administrative activities. The necessity for a high innovation rate is significantly accentuated by the raise of new technologies and the digitalization trend which is impacting each sector. Moreover, being theaters performances directly related to customers' perception, it is necessary for these institutions to provide services and be in touch with the market according to the pace of the digital evolution.

However, it is easy to see that the literature in this field is not rich and does not present a comprehensive view of how a theater can be 360° proofed by digital technologies.

Given the importance of digitalization in theaters, it is also necessary to quantitively assess their digital performance. Evaluating the digital maturity of theaters is indeed fundamental for two purposes. First of all, it is useful for the theater to understand its strengths and weaknesses and what to focus on when defining a plan of action for the future. In addition, the assessment of their digital maturity can be used as a benchmark for comparison with other theaters in order to understand how to make continuous improvements. Indeed, it is increasingly urgent for theaters to remain competitive and the only way to do this is to embrace what new technologies offer, as has been made clear by the pandemic.

Therefore, performance measurement systems are critically important for cultural institutions, especially when they are associated with quality, governance and accountability (Badia & Borin, 2011).

Performance measurement systems could give different benefits to theaters such as a contribution in the decision-making process and a support both in the internal and external reporting. However, they are not so easy to be implemented. Indeed, they could present high costs for the organization, and they should also present a certain degree of flexibility.

In any case, alongside the fragmented and not efficient view of digitization in theaters, then, there is also this major shortcoming in literature. It is not possible to find any model for measuring digital maturity in theaters, despite the fact that such models have been widely studied and are being developed and adopted in many sectors, most notably in the manufacturing one. Thus, although there are many interesting digital maturity models for industry 4.0, nothing has been

developed specifically to assess the maturity of theaters, so each one should be readjusted and rethought based on the specific peculiarities of this world.

Hence, our Master Thesis stems from these considerations, which first and foremost assumes a central role at academic level, serving as a central link in the study of three macro areas: Theater, Digitalization, and Performance Measurement.

Indeed, the aim of this research is to develop a model for measuring the digital maturity of theaters by answering the following research questions:

- RQ1_ Which are the digital transformation dimensions in theaters?
- RQ2_ How is it possible to assess each of these digital transformation measures identified?
- RQ3_ How is it possible to synthetize all these dimensions into a single index?

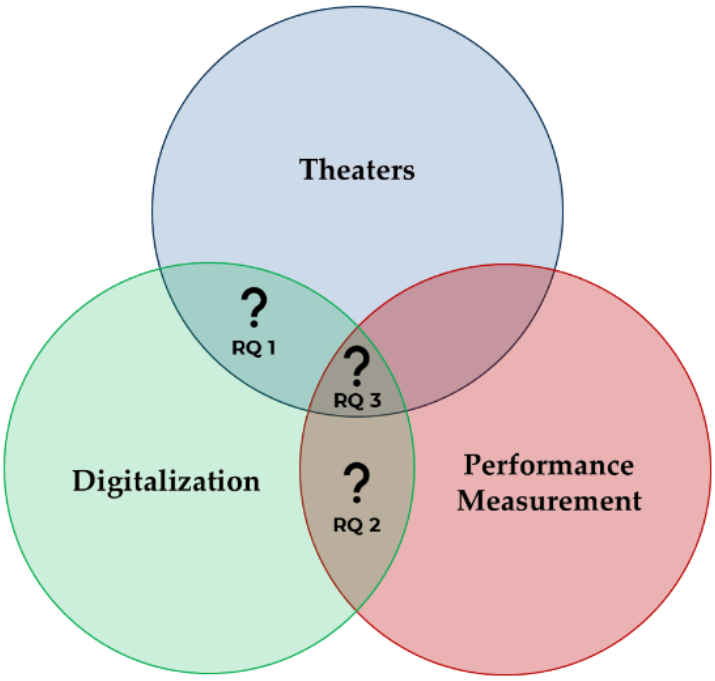


Figure I - Literature Gap & Research Questions

Accordingly, the final output consists in a tailor-made digital maturity model for theaters in order to provide a way to classify institutions according to their positioning in terms of digitalization.

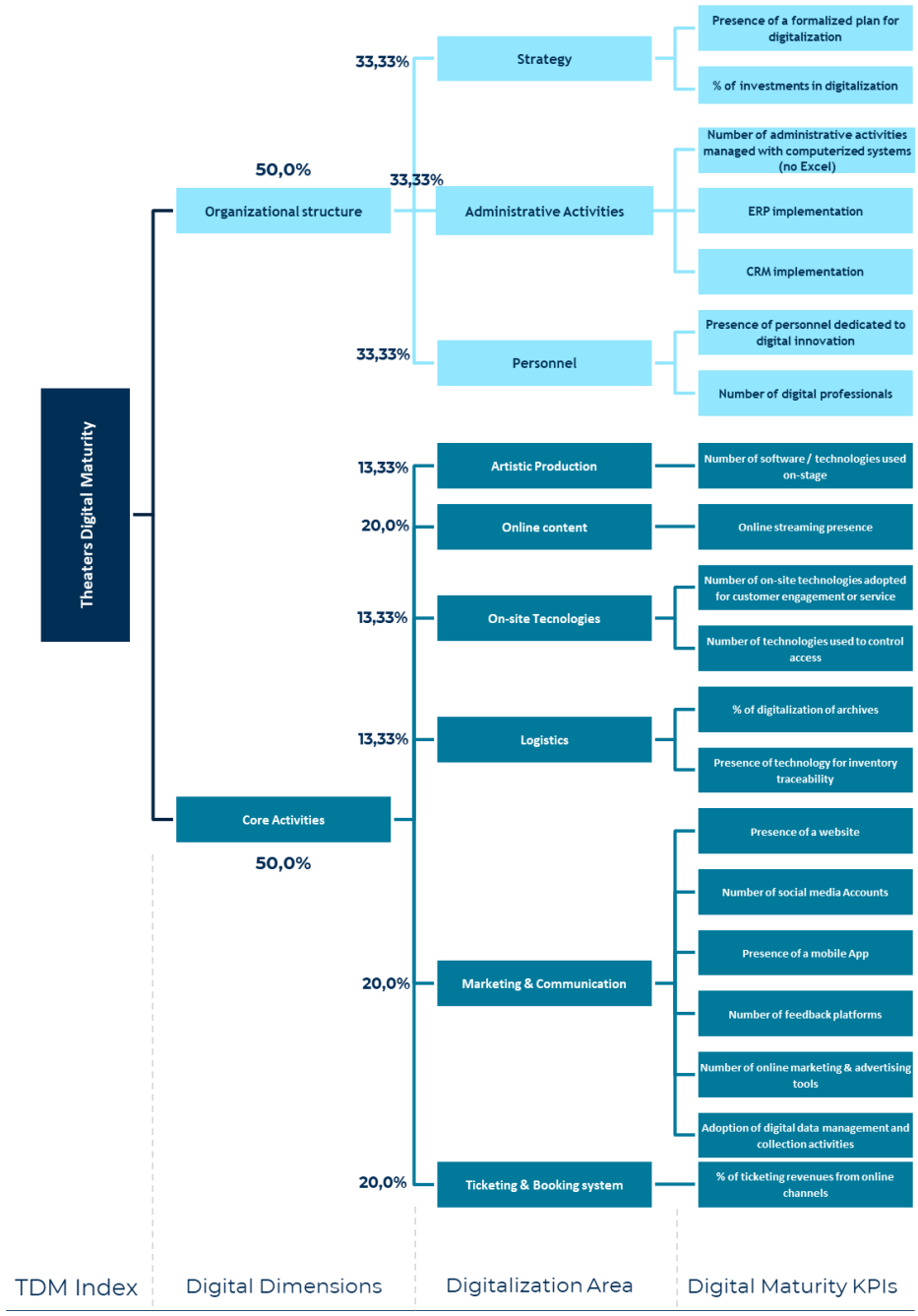


Figure II - Theater Digital Maturity Model

The model is developed on two main dimensions as represented in Figure II. For each of them, it then identifies more areas in which digitalization can be applied. Subsequently, different KPIs have been associated to such digitalization areas in order to concretely assess the digital maturity level.

The two macro dimensions, i.e., Organizational Structure and Core Activities, encapsulate all the main areas that need to be taken into account in order to assess the impact of digitization on theaters.

They deployed totally into nine digitalization areas based on the findings from the literature review. These sub-dimensions collectively provide a comprehensive view of a theater's organization and consider all the relevant aspects for the assessment of its digital footprint.

In particular, we can list:

- Strategy: Activities aimed to conceive the value proposition of the theater and its organization to achieve its goals and gain competitive advantage in the market.
- Administrative activities: Supervisions, monitoring and control activities at monitoring that ensure that the enterprise has its best chance of succeeding.
- Personnel: Human resources which determine the availability of skills and know-how within the organization, of course related to digital competences.
- Logistic: Internal activities for the management of archives and warehouses, as well as for the handling of instruments and costumes needed for staging.
- Artistic Production: Activities related to the construction and staging of the show.
- Marketing & Communication: Activities related to the development of customer engagement and customer interaction, including the management of critique online, through online tools and new digital strategy. This activity also includes all the aspects related to advertising online and the management of data to better profile customers and engage in appropriate marketing strategy.
- Ticketing & Booking system: Activities related to understand the purchasing behaviors of the audiences and to define the most appropriate sales strategies.
- On site Technologies and services: Activities related to creation and the development of onsite customer experience, through the adoption of a variety of technologies.

- Online content: Activities specifically related to the delivery of performances via online streaming.

In all these dimensions, digital aspects are clearly explored in depth and the impact that new technologies have is evaluated through the chosen KPIs.

The model has been tested on Italian territory, in particular on four categories of theaters receiving contributions from the Fondo Unico per lo Spettacolo:

- National Theaters
- Theaters of Significant Cultural Interest
- Traditional Theaters
- Lyric Symphonic Foundations.

The main results, echoing the two main dimensions of the model, that compose the final Theater Digital Maturity index (TDM) are schematized in table I.

Theaters	Organizational Structure	Core Activities	TDM
Lyric - Symphonic Foundations	38,2	56,3	**47,2**
National Theaters	49,7	53,6	**51,6**
Theaters of Significant Cultural Interest	32,2	39,9	**36,0**
Traditional Theaters	30,4	37,8	**34,1**
Total	**36,8**	**46,6**	**41,7**

Table I - Dimensions and Digital Maturity level final values

Applying the model to the categories highlighted it has been possible to find an average value of the Theater Digital Maturity index equal to 41,7 on a scale of 100. This value is given by the weighted average of the two macro dimensions, i.e., Organizational structure and Core activities.

In general, all theaters appeared more mature in core activities rather than in organizational structure and this shows a pragmatic approach to digitization that lacks a complete digital strategic vision. The most well positioned are the National Theaters, of course because of the great results they have in organizational structure and in core activities. They are followed, immediately after, by Lyric Symphonic Foundations thanks to the great and positive impact of the core activities. In Figure III, it is immediately visible, for each category of

the theaters analyzed, on which area they are stronger and where, instead, there are the biggest lacks on which they should invest and be careful in future.

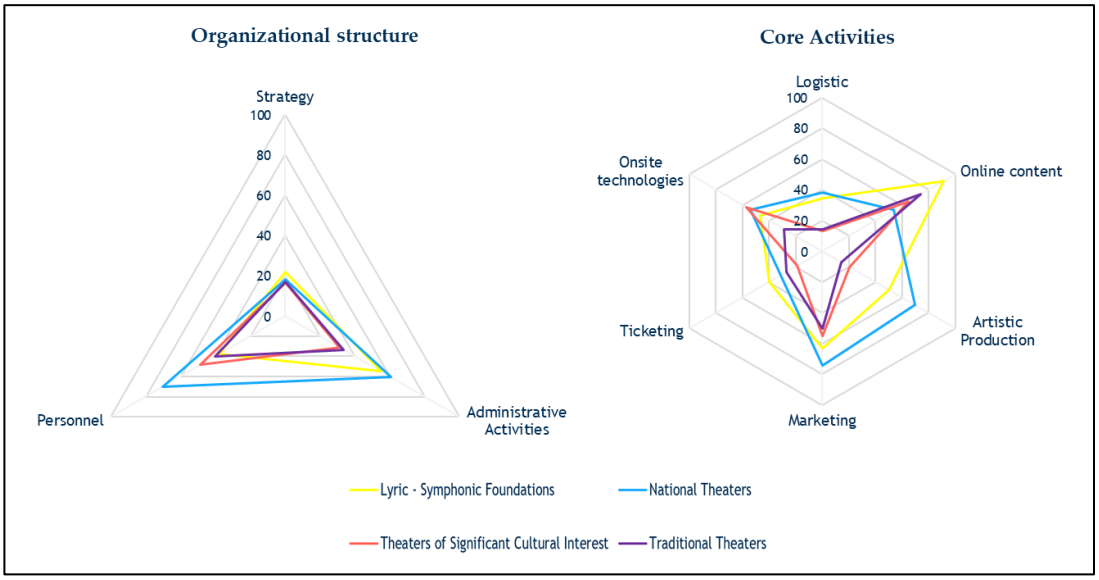


Figure III - Radar chart, Digital maturity by theaters' category

The last step of the model application, thanks to the Statistical Clustering performed adopting the Centroid linkage methodology, allowed to classify Theaters of the sample into four categories (Gill & VanBoskirk, 2016), according to the two dimensions of the model:

- Differentiators, which have a high level of digitization both in terms of organizational structure and approach to digital business strategy.
- Collaborators, which are still characterized by a value of Digital Maturity (TDM) higher than the mean of the sample, but their level of implementation in the main activities for enhancing a better customer experience is lower compared with differentiators.
- Adopters, who are in the opposite position compared to collaborators and have a level of digitalization in terms of structure below the average, even if they have good performance in terms of activities' digitalization.
- Skeptics, who do not believe that digital disruption is important to them are thus characterized by a low level of digital maturity in both the macro dimensions of the model.

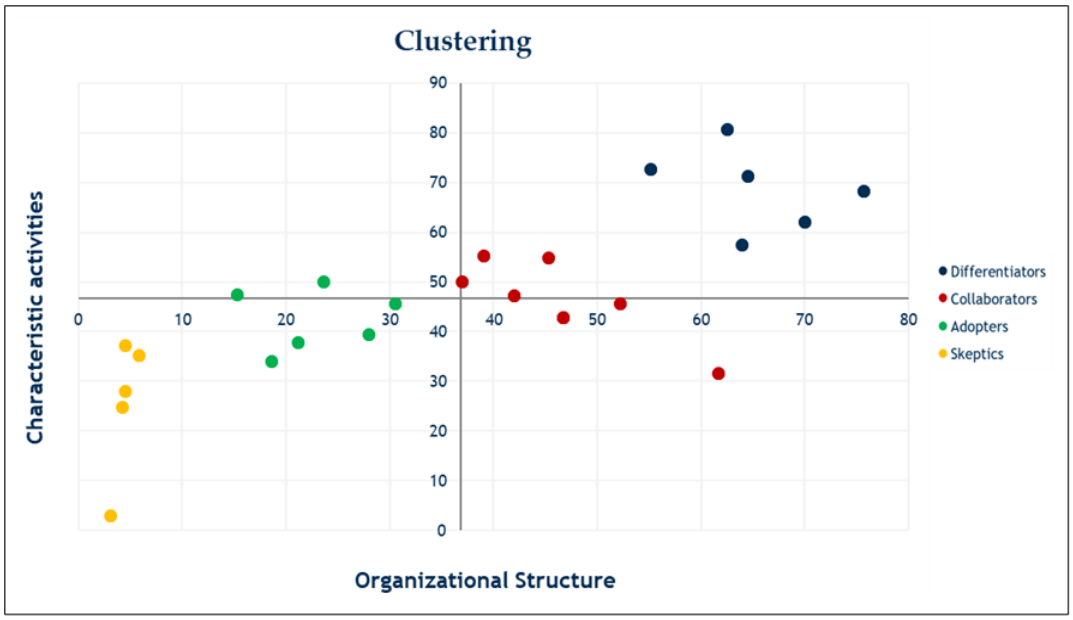


Figure IV - Cluster Analysis

This classification gives some guidelines to theaters in terms of the area on which they should invest and improve in future in order to increase their level of digitalization. In general, it is interesting to note that all the theaters, also the ones called "differentiators", although they have better results compared to the other, lack in the field of strategy, which should be instead the most relevant activity to focus on in order to drive digitalization at 360 degrees. On the other hand, instead, in all theaters the most developed core activity is the online content, of course thanks to the pandemic of the last years. At the same time, also ticketing is not so much differentiated among the different clusters, while in logistic and artistic production, for example, there is a huge gap in terms of digitalization between the differentiators and the other clusters.

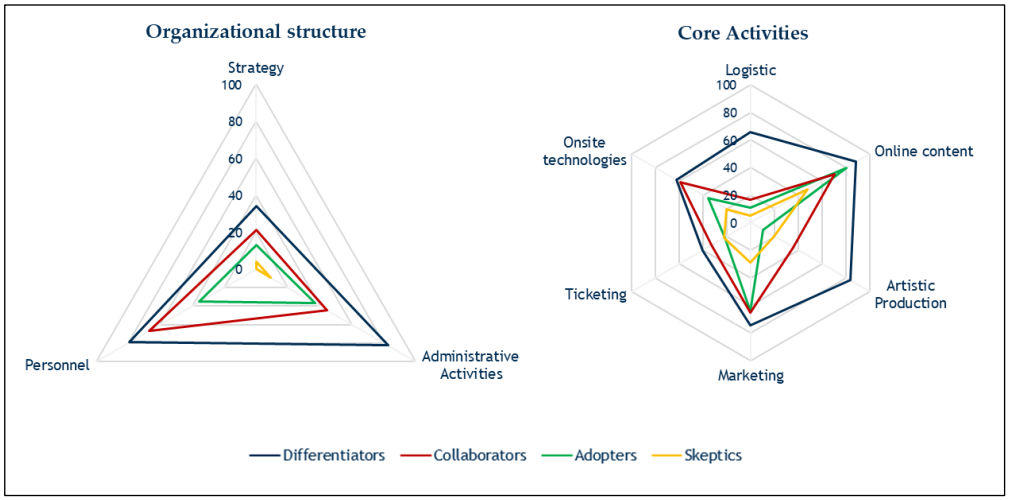


Figure V - Radar chart comparing the different clusters under each dimension

From the academic standpoint, this Master Thesis covers an important literature gap between the areas of Theater, Digitalization and Performance Measurement. Moreover, it also sits alongside all the digital maturity models that have already been developed for SMEs or within industry 4.0, going to highlight how this assessment is important also for the cultural sector.

From the managerial standpoint, then, it could help managers to understand how they are positioned in digital terms and also with respect to the other institutions and to identify the specific areas on which they can and should improve both in a short and in a long-term perspective. Of course, this will enable theater managers to take a longer-term view on the investments that need to be sustained in the following years, in order to be able to survive and to remain competitive in future. Also, a quantitative assessment of the level of digital maturity of the current situation, could be useful as a signal to receive funds and grants based precisely on the theater's ongoing technological progress and/or based on the future plan. Finally, being the model developed after the pandemic, it could be useful also to understand how institutions have reacted to such a disruption consequently measuring their degree of resilience.

Moreover, another relevance of the research refers to the great benefits that it can grant at the ministerial and governmental level. Indeed, the quantitative results of its application could be used as a criterion of choice for the distribution of public funds, but also to understand which are the best strategies to adopt for the future within the cultural sector.

Finally, a great strength of this model lies in its simplicity and intuitiveness, which facilitates its application, critical reading of the results, and adaptation in case of changes in the characteristics of theaters or, even, in case of foreign adoption.

Nevertheless, there are some important limitations of this model to consider in assessing the results. First of all, the data collected are enough, but minimum to perform more meaningful statistical analyses.

Moreover, the choice of sample relying on the ministerial decree that allocates funds from the Single Fund for Performing Arts excludes all the other theatrical realities and so might be reductive and not totally expository of the Italian landscape. However, since there is no up-to-date census of Italian theaters that includes all those with a permanent establishment, it is not possible to have a

more scientifically valid sample for research. In addition, some results, especially the ones related to the ticketing and booking indicators, are affected by the impact of Covid-19 which have drastically worsened theaters' economic position. This is the reason why, in performing the statistical analysis of variance, we have adopted revenues data related to 2019 to avoid any distortion.

Another limitation of the research was found at the questionnaire administration stage, where many theaters stated that they were unaware of some data necessary to answer and so never finished filling it. Finally, further limitation might be the attribution of the weights, because since the situation is constantly evolving, it could be that what is valid today, is no longer valid in a few months and so they will be revised in future considering the technological situation.

In future, however, some interesting research could be done based on this work.

First of all, it will be possible to expand the analysis to all theaters in Italy so as to have an even more complete picture and to compare the results obtained for theaters in the FUS categories and the other realities.

Then, applying the model to a larger sample will allow for very meaningful statistical analysis to see the direct correlations between variables and what immediately impacts digital development.

Finally, it will be also possible to broaden the analysis to the international context to find numerous contributions both academically and politically.

Introduction

Relevance of the Topic

Theater, since ancient times, has played a key role in human development and evolution. It has always represented a place for gathering, meeting, exchanging thoughts and ideas, and it has always been central to the dissemination of art. Theater has always represented a key vehicle for the diffusion of culture, and it is perhaps among the most conservative sectors, due to the nature of the artistic products it offers which cannot be separated from a live audience. However, it is always more and more evident how it is not unaffected by the impact that new digital technologies have had and continue to have on all sectors and businesses. Indeed, in recent years, technological development has profoundly disrupted organizational and managerial processes in all areas and has forced companies to rethink their business models in order to survive and keep up with the times.

The cultural sector, and theaters in particular, have not always been able to fully embrace these new developments, due to the very nature of the theater organization and, at times, due to a failure to view theater as a true business enterprise, with the need to align artistic offerings to the demands of economic sustainability.

The advent of Covid19 and the restrictive measures designed to curb it, however, have forced theaters to take a hard look at the potential and importance of incorporating digital technologies into every stage of theater management and organization. In addition to a new way of thinking about the delivery and production of performances, in fact, in the last two years it has also become increasingly urgent to rethink all those back-office activities, which managed in a traditional way and without the help of advanced technological tools, do not allow them to remain economically viable in the market. Therefore, in addition to offering the theatrical product in an alternative way, reorganizing itself through online streaming, for example, theaters must increasingly figure out how to incorporate digital technologies fully into their organization, making the processes of logistics, security, personnel management, and strategic and investment planning digital and flexible.

We can therefore say that this pandemic has in some ways represented a valuable opportunity to unhinge now somewhat antiquated logics that theaters do not need digital to remain competitive and has given a strong push toward viewing the theater organization as 360-degree digital. Digitalization

Theater in Italy and Covid-19 impact

The Performing Arts Observatory - SIAE, divided Italian theater activity into the following categories:

- Theater
- Opera
- Magazine and musical comedy
- Ballet
- Puppetry
- Miscellaneous art
- Circus

In particular, from the latest data published in 2019 and 2020, it is possible to better appreciate the crisis created by the pandemic on this cultural sector. In fact, in general, considering the aforementioned theatrical activities, between 2019 and 2020 there was a reduction in admissions of 70.41 percent and an estimated loss on box office expenditures in the Italian theatrical scene of 77.78 percent with a total value only in 2020 of 94.6 million euros.

Table II summarizes the situation conditioned by the pandemic with respect to 2020 figures for the theater sector both in terms of number of shows and public box office expenditures and also taking into consideration how the actual offering is geographically distributed among Italian regions.

Year	Number of shows	Box Office Expenses
2019	132201	426,03 mln €
2020	46527	94,65 mln €
2019-2020	**-64,8 %**	**-77,78 %**

Table II - Italian Theaters pandemic Impact (Osservatorio dello Spettacolo - SIAE)

Although 2021 figures have not yet been published by the Performing Arts Observatory, the reduction in pressure from the pandemic has allowed for a recovery that is continuing in the current year. In this regard, the role of digitization has proven to be crucial. Indeed, more digitalized theaters have been able to still deliver streamed shows and also achieve good numbers in terms of revenues thus proving resilient in the face of such a disruption.

Aim of the Research

From these current considerations and from the urgency of having increasingly digitized theatrical institutions in order to remain competitive in an ever-evolving world, made even more evident by the advent of Covid19, the objective of our Master thesis was born.

To assess the importance of digitalization at any level of the theaters' value chain, the study "Mapping the Creative Value Chain", (European Union Publication) suggests how digitalization have impacted theaters:

- At creation level: new technologies often act as an enabler facilitating the creation of works and products or allowing for radically new products or services.
- At production level: new solutions appliable to the stage setting
- At distribution level: radically new models have appeared with the widespread development of streaming solutions
- At marketing level: social media tools and other interactive applications enable to target more fine - grained audience demographics, while potentially aiming at greater audiences
- At management level: software and new digital programs allow to simplify and make faster and more flexible all the activities of management of the organization.

The research work aims to understand the positioning of Italian theaters in terms of digital maturity, by designing a model, built specifically on theatrical realities, that goes to measure their level of digital maturity.

The Master Thesis, therefore, achieves its goals by answering the following research questions, which address three main areas of knowledge:

- RQ1_ Which are the digital transformation dimensions in theaters?
- RQ2_ How is it possible to assess each of these digital transformation measures identified?
- RQ3_ How is it possible to synthetize all these dimensions into a single index?

The creation a Digital Maturity Model for Theaters, which represents the final output of the Master Thesis, is crucial for all the premises done before and its relevance is related to different fields of application.

Firstly, the Master Thesis is aimed at addressing, through the development of the model together with the analysis of the state of the art, the literature gap actually present:

1. Lack of literature related to the most important dimensions to be considered crossing Theaters and digitalization
2. Lack of a performance measurement system on theaters
3. Lack of a Digital Maturity level assessment of theaters

From the managerial perspective, the development of the research has the objective to provide a useful and quantitative tool able to evaluate the digitalization of the institution:

- To catch the main areas of underdevelopment within the theater in order to define the correct investment strategy
- As a benchmarking instrument to map the current positioning of the theater compared with the other institutions in order to define the best strategy to achieve a competitive advantage.

From a broader perspective, then the Master thesis is also aimed at providing a tool which allows governments and institution to assess the national situation of theaters in terms of digitalization and consequently define the correct distribution of funds based on a quantitative result simple to be assessed. Moreover, this panoramic of the current situation could give insights about the right vision for the future to improve the cultural sector which represents one of the most important assets of our country.

Overview of the Research

In Chapter 1 it is reported a deep literature review on three main macro areas: theater and its management, digitalization and performance measurement.

The chapter opens with an analysis of the evolution of theater throughout history, dwelling in particular on the most important managerial and organizational changes over time, leading to an overview of the Italian theater scene today. After that, the relationship between theater and management and that between theater and digitization are studied, until we come to highlight the research questions based on the important gap which precisely our Master thesis work seeks to cover.

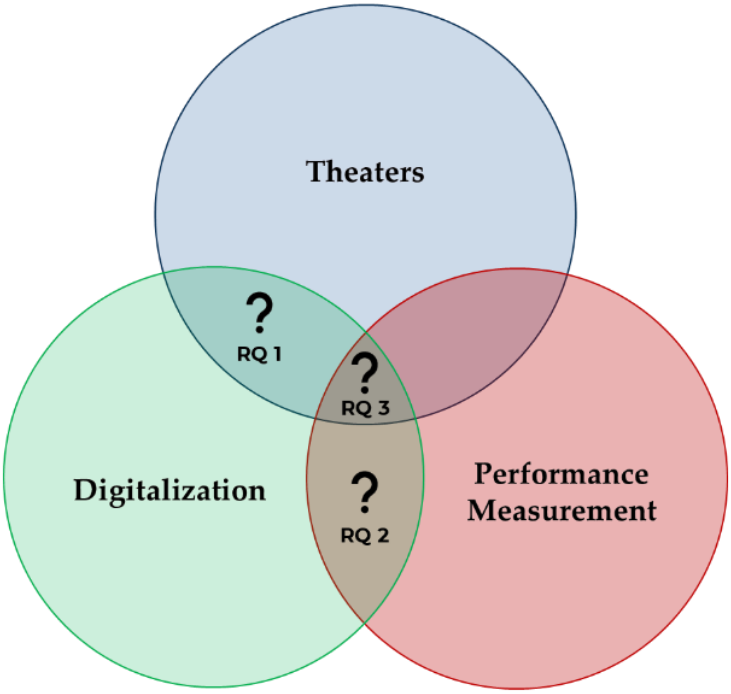


Figure VI - Literature Gap & Research Questions

Next, Chapter 2 reports the methodological approach that has been followed throughout the writing of this Master thesis. Indeed, it is clarified here how the literature review was conducted, how the questionnaire administered to the chosen sample was created, and how the data analysis was carried out.

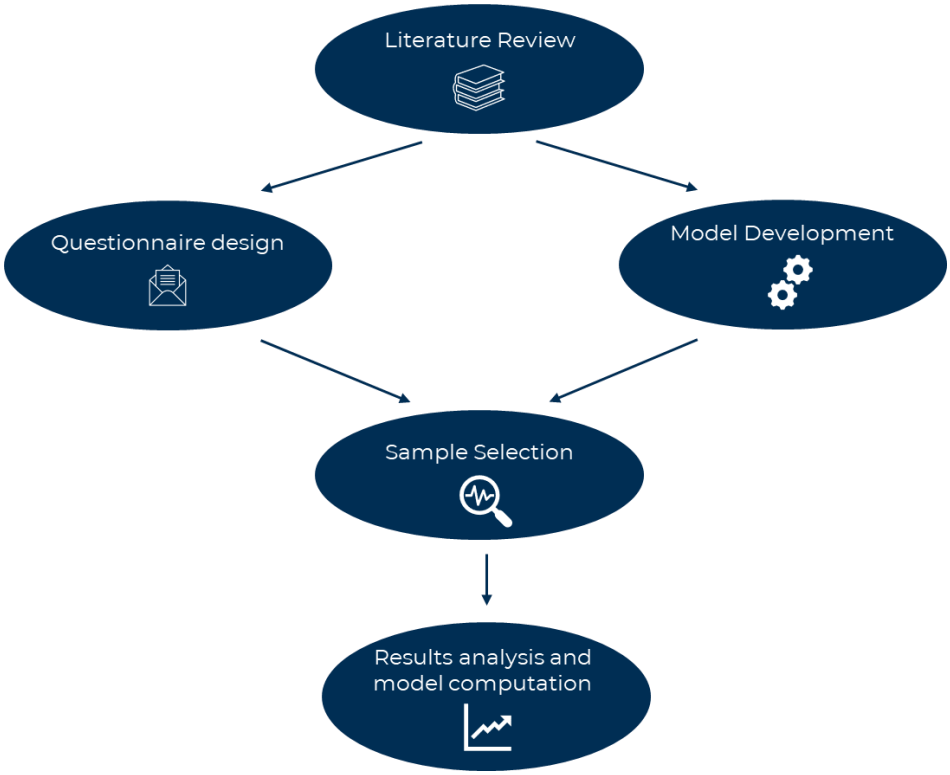


Figure VII - Methodology Framework

In Chapter 3, the model constructed to assess the level of digitization of theaters is reported, with a clear and detailed explanation of each of its dimensions and why it was constructed in this way. Each indicator chosen to measure the level of digitization and the weight each has in the final assessment is also thoroughly explained.

Then, Chapter 4 applies the model to the chosen sample and detailing the analysis of the collected responses. All the KPIs, dimensions and macro dimensions results are carefully explained. Moreover, there are also some deep considerations on the clusters identified through the application of the model, with some useful insights on the areas they should be focused on in future.

Finally, the last chapter highlights the most important considerations that the application of the model has identified. It also presents the main strengths and the main weakness of this research together with some insights for future research.

1. Literature Review

In this chapter of literature review, some aspects that are considered to be crucial for a correct development of the work will be analyzed.

There are three main issues underlying this Master's thesis that are closely related to each other: theater and in particular its history and its organization, digitization in theater, and the measurement of digital maturity in theater.

It is important, then, to analyze what can be found in literature about the relationship between these three important aspects. However, it is necessary to note at the outset that there are no studies that explains and analyzes this triple relationship in detail.

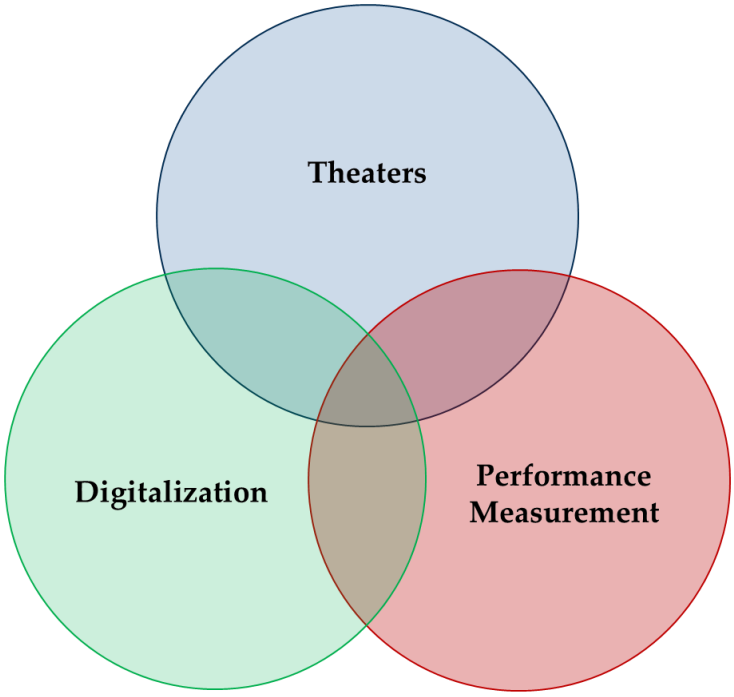


Figure 1.1 - Venn Diagram with three macro-topics of the Master Thesis

For this reason, we have divided this chapter into two macro-sections.

First of all, we will start with an overview on the history of Theater, from its birth to the present days, paying particular attention to the evolution of the theatrical space in order to understand how we have arrived at the idea of theater that we have today.

Indeed, a reflection on the theater in Italy cannot ignore its history and the evolution of its spaces, because it is true that the history of theater, the evolution

of stage space and theater construction have always influenced each other (Gallina, Organizzare teatro, 2007).

There will also be a focus on the different forms of live performance and on the current landscape of theater organizations.

Then, it will be studied the management of theaters and the main organizational lines that need to be taken into account for a proper management.

Moreover, this work will dwell on the digital technologies already adopted in the theaters and on the opportunities that have emerged and that are already partially adopted. For example, in this part, it will be analyzed lighting, digital archives, online critique and data collection about customers, virtual reality and the opportunities for online streaming which were already becoming more and more common in theaters, but that, with the advent of the Covid pandemic, have become a necessity that today can be exploited as an opportunity

After that, it will be possible to find, in the second section of this chapter, a focus instead on the measurement of digital maturity in theaters, going to assess whether models have already been developed with the sole purpose of investigating the level of digitization in theaters. In reality, it will soon be realized that no such models have been developed, so just performance measurement and digital maturity models in other industries will be evaluated, but they will be useful to understand how to build one tool suitable for this field.

1.1 Theater: History, Management & Digitalization

1.1.1 The History

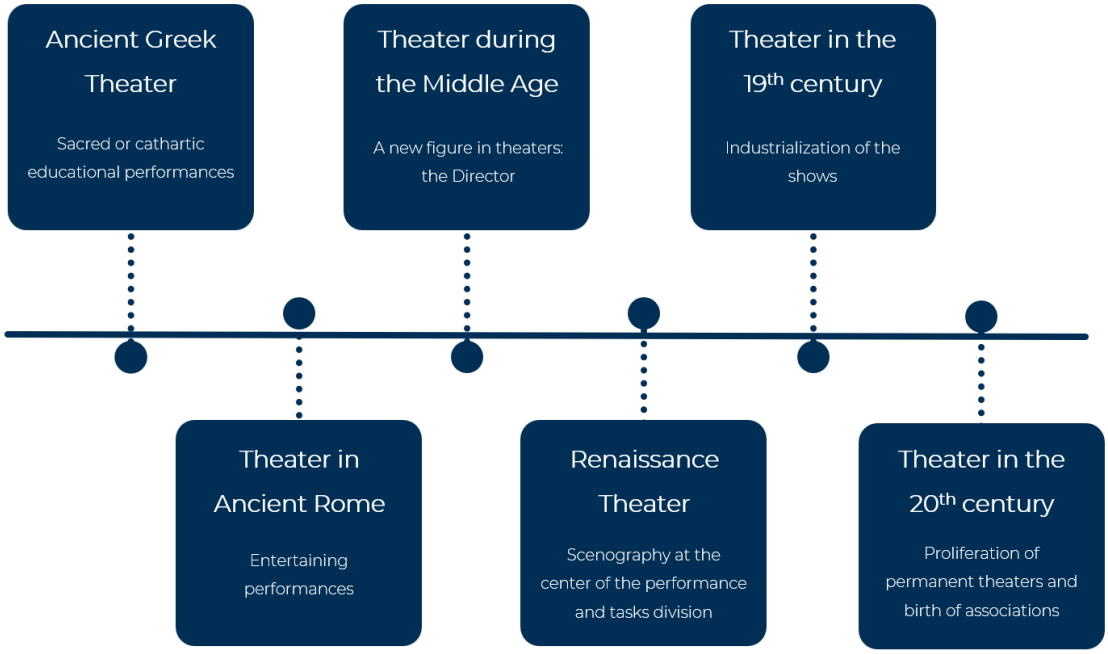


Figure 1.2 - History of the theater, timeline

1.1.1.1 Ancient Greek Theater

Theater, as it is known, has distant and mysterious origins.

It is a complex art, which requires the convergence of many elements: a story to tell, a dramatization of this story, a place where the representation can take place, actors who interpret the drama, costumes, a possible scenic setting and, of course, the audience (Wilson & Goldfarb, 2010).

The origin of Western theater is located in Ancient Greece and, in particular, in Athens around the V century BC in connection with the Great Dionysus, religious ceremonies related to the cult of Dionysus. Thus, theater became an essential moment of these ritual celebrations, in which all social classes participated (Wilson & Goldfarb, 2010).The origin of Western theater is located in Ancient Greece and, in particular, in Athens around the V century BC in connection with

the Great Dionysus, religious ceremonies related to the cult of Dionysus. Thus, theater became an essential moment of these ritual celebrations, in which all social classes participated (Wilson & Goldfarb, 2010). A fundamental stage in the development of Greek theater is then to be traced back to tragedy and to the works of the three main playwrights of the fifth century - Aeschylus, Sophocles and Euripides.

Certainly, the religious origin of the theater can also be seen in the theatrical buildings of the late fourth and mostly third century BC available to archaeologists, which show that their location near the temples was to indicate a close relationship with the sacred or cathartic-educational functions of the performances in that period (Trezzini & Bignami, 2007). Certainly, the religious origin of the theater can also be seen in the theatrical buildings of the late fourth and mostly third century BC available to archaeologists, which show that their location near the temples was to indicate a close relationship with the sacred or cathartic-educational functions of the performances in that period (Trezzini & Bignami, 2007).More specifically, the theatrical buildings, if we can call them like that, mostly used a natural slope, a hill, on which a system of semicircular tiers was implanted around the Chorus (Alonge & Perrelli, 2019), to ensure better visibility for spectators.

Already these primitive theatrical forms were characterized by many of the elements that distinguish a show in the common imagination of our days. In addition to the Chorus, which played a key role, actors dressed in costumes took the stage, and they get dressed in the skene. The skene (from the Greek word for curtain) is reminiscent of the wings of modern theater. It was, indeed, a kind of wooden shack, used precisely by the actors to get dressed, the front of which could serve as a generic setting (Wilson & Goldfarb, 2010).

Moreover, despite being an open-air performance, Greek theater did not completely ignore stage effects produced by specific artifices (Alonge & Perrelli, 2019). Moreover, despite being an open-air performance, Greek theater did not completely ignore stage effects produced by specific artifices (Alonge & Perrelli, 2019). We can remember, for example, the mechanè, a kind of crane that lifted the actors in the air, as in a kind of flight (Alonge & Perrelli, 2019) or the intent to create light effects to produce more suggestive settings.

Finally, it is also important to mention that comedy, no less than tragedy, also expressed the deep spirit of Athenian society, although its full emergence is from

the second half of the fifth century, that is, somewhat later than tragedy (Alonge & Perrelli, 2019).

1.1.1.2 Theater in Ancient Rome

It was precisely the comedy that, because of its low and hilarious representation of life and customs, had a certain fortune in Rome, while tragedy (more connected to the religious matrix) was practically neglected. Indeed, while theater was linked for the Greeks to the values of a community, for the Romans it never had this relationship of deep adherence to the life of society and it was essentially an imported phenomenon (Alonge & Perrelli, 2019), foreign to the traditions and culture of the origins. Thus, theater became entertainment, an occasion of leisure that could emotionally engage but not make people think about important existential issues (Wilson & Goldfarb, 2010).

Roman theaters echoed the architectural structure of Greek buildings, but unlike them, they were not usually resting on the slope of a hill. Most of our knowledge about Roman theaters comes from Marcus Vitruvius, who also emphasizes the importance of acoustics in Roman theaters, which was particularly cared for.

In addition, it is interesting to mention that the Romans used two types of curtains: the auleum, located in front of the stage, which was raised and lowered by a mechanical system, and the siparium (Wilson & Goldfarb, 2010). These are ancestors of what we have today.

Having absorbed drama from the Greeks, the Romans cannot be considered inventors of dramatic forms, but, instead, they developed a wide variety of popular entertainments. Popular entertainments - based on spectacular types such as dance, acrobatics, and pantomime - are a kind of common thread that runs throughout the history of theater and, in some eras, including the Middle Ages, were the only theatrical forms staged (Wilson & Goldfarb, 2010).

With the collapse of the Roman empire, then, the tradition of theater, which had survived uninterruptedly for a millennium, came to an end, and for its rebirth it is necessary to wait several centuries, until the Middle Ages.

In any case, the classical theater (more properly the Greek one inherited from the Romans) founds, on the whole, a model of dramaturgy that remains decisive in the history of Western entertainment, because it fixes some characteristic traits (Alonge & Perrelli, 2019).

1.1.1.3 Theater during the Middle Ages

After that, it is noteworthy to take into consideration the Middle Ages. In order to understand the forms of medieval theater, first of all it is necessary to make a conceptual effort that goes beyond the point of view with which we are used to thinking about the spectacle today. Indeed, it is necessary to imagine a theatricality that is independent from the primacy of the text and the author, from the direction, from the autonomy of the staging as an artistic product, from the clear separation between actors and spectators, from professionalism, from the presence of theatrical buildings built specifically for the representation and from the enjoyment of the performances and their programming within the cultural market. In short, very little of what represents normal performance practice in our eyes, today, instead it characterizes medieval theater (Alonge & Perrelli, 2019).

The theater as an institution, moreover, no longer existed in the Middle Ages, and the theater buildings of the past were left to fall into disrepair.

In addition, the medieval theater presented two antithetical organizational forms. The first is the one of professionalism under private management: the spectacle of the "jesters". With “jesters” we refer to a wide range of entertainers, who performed in the streets, in taverns, in squares and even at court. They were the subject of harsh condemnations by Christian writers. The second is the one of the voluntaristic practices organized by the church for didactic purposes. These liturgical dramas, which recounted the main episodes in the life of Christ, tended to be performed in churches using temporary staging.

Then, parallel to these liturgical dramas, sacred representations (mysteries) were also developed. They took place outdoors and, because of the complexity of the representations, they gave a push to the adoption of a superintendent who was in charge of the staging. This director did not perform the functions of a modern director, in the sense that he did not elaborate a unified interpretation of the text, but, from an organizational point of view, it can be considered an antecedent of the figure of the theater manager, which will emerge many centuries later (Wilson & Goldfarb, 2010).

1.1.1.4 Renaissance Theater

After the medieval era, it is worth noting another stage in the history of theater: the Renaissance. Between the end of the fifteenth century and the beginning of the following century, the court theater developed. It had the function of cheering up a small number of spectators (courtiers), within an event (a coronation, a wedding, a birth, a formal entrance of an excellent guest). It was totally financed by a prince, with the manifest task of exalting the magnificence of the patron (Trezzini & Bignami, 2007).

Since the purpose of the representation was to induce the spectator to divulge the magnificence of the court, every detail had to give the greatest possible effort of technical skill. Therefore, scenography played a central role and this huge demand for "special" effects attracted at the courts a crowd of very high-level technicians, who worked in a coordinated way constituting a sort of "project team" (Trezzini & Bignami, 2007). Since the purpose of the representation was to induce the spectator to divulge the magnificence of the court, every detail had to give the greatest possible effort of technical skill. Therefore, scenography played a central role and this huge demand for "special" effects attracted at the courts a crowd of very high-level technicians, who worked in a coordinated way constituting a sort of "project team" (Trezzini & Bignami, 2007). Then, the first attempts to create a stage lighting system were also made. Since the theaters were indoors, artificial lighting was still necessary: usually candles and oil lamps were used, but they also began to try to control the intensity of the lighting, covering the lamps with open-colored boxes (Wilson & Goldfarb, 2010).

In this period, there was also a gradual move from the concept of theatrical place to the actual theater. Indeed, while till to that moment performances had taken place in repurposed spaces, such as courtyards and halls, then there was an increasing awareness of the function of the theater and of the definition of places permanently used for performances. However, while these were academic or court theaters, only in 1637 a theater was opened to the paying public for the first time in Venice. (Wilson & Goldfarb, 2010).

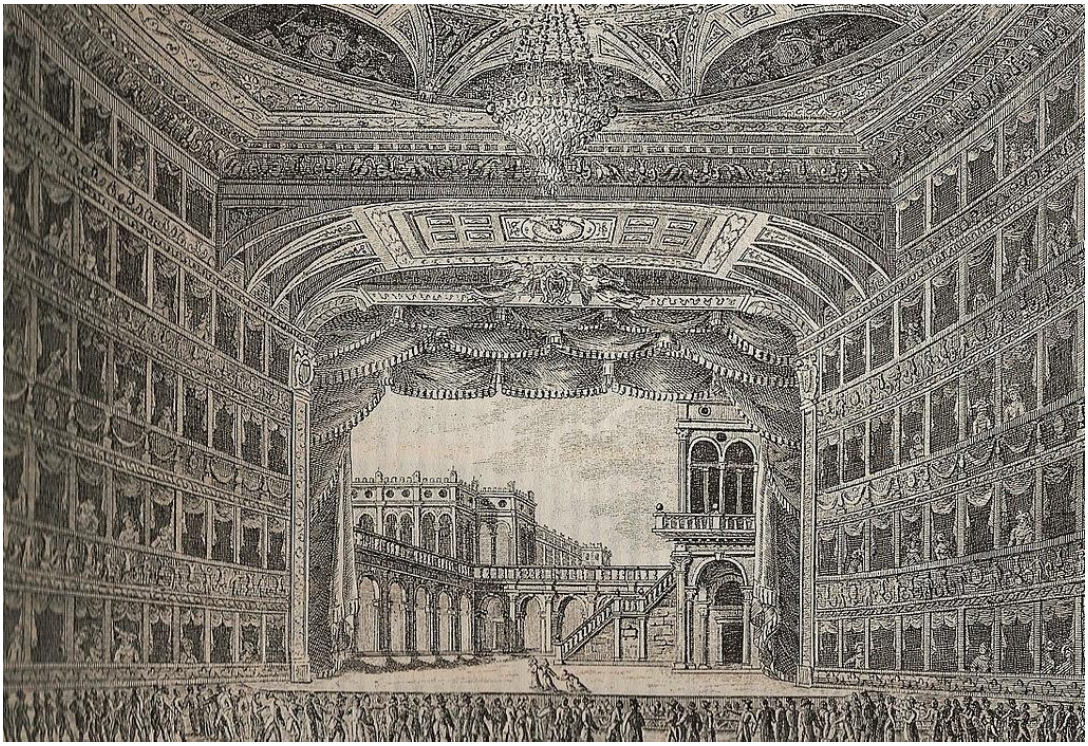


Figure 1.3 - San Cassiano Theater, Venice, 1637

Since this and the subsequent newborn theaters were commercial enterprises, which required the largest possible number of paying spectators, they had a very large audience area, which was divided into stalls, boxes and gallery, going to constitute the typical structure of "Italian" theaters.

Many of these historic theaters are accessible today, and others are being restored and modernized. Still today they carry out their activity with continuity as seats of the most important Lyric Theaters or stable theaters of prose or for the seasons of hospitality of the smallest municipalities. They represent most of the current theatrical buildings in Italy as well as being a historical and artistic heritage of unparalleled value. However, the most relevant problem has been - and still is - that of integrating, in centuries-old structures, modern technologies that aim, in particular, at an evolution of the automation of movements, lighting systems and the care of prevention and safety (Gallina, Organizzare teatro, 2007).

Then, of this period, it is also important to mention that in Venice, between 1637 and 1642 were born at least 5 other theaters managed by characters, who, although lacking money, proved to be able to increase their assets by investing in the production of the show. In order to do this, it was necessary to pass from the concept of representation as a unique and unrepeatable event, to the habit of repeating the shows: in this way, the theater, like every high commodity, if mass-

produced, brings a sufficient income not only to cover the production expenses - human work and raw materials - but able to earn a "surplus" satisfying both the organizer/deviser and the first investor (Trezzini & Bignami, 2007).

At that time, the most conspicuous expenses concerned the setting up of the theatrical machines, which, as seen in the courts, played a key role in the creation of scenic effects. It was then necessary to reuse the machines repeatedly in order to amortize their costs.

Clearly, moving from one city to another, staging shows repeatedly, understanding how to transport and readjust cumbersome sets, contacting other intermediaries became a real job. Therefore, a separation of tasks between artistic, technical and organizational staff became more and more evident: the "tertiary sector of the show" was born (Trezzini & Bignami, 2007).

The other great side of the sixteenth century is constituted by the “Commedia dell'Arte”, which marked the real rebirth of the theatrical professionalism (Wilson & Goldfarb, 2010). Indeed, a notarized document that sanctions the birth of the first "company" is dated February 25, 1545. This document shows that eight men decided to form themselves into a sort of company to "act out comedies from place to place" in order to "earn money" (Alonge & Perrelli, 2019). This historical find, with the establishment of a company of professional actors, sanctions the birth of modern theater.

This historical find, with the establishment of a company of professional actors, sanctions the birth of modern theater. The “Commedia dell'Arte”, then, even if originated in Italy, thanks to the nomadism of the companies, it soon spread to other countries in Europe, especially France, where it achieved enormous success.

1.1.1.5 Theater in nineteenth century

Leaving aside the Elizabethan theater, which developed in England shortly after the birth of the “Commedia dell'Arte”, it is now interesting to analyze the theater of the great Actor between the nineteenth and early twentieth century.

The second half of the nineteenth century is a very complex turning point for the Italian theater, in which several issues intersect, gradually leading to a new type of organization and industrialization of the show: those related to copyright, stable companies and the role of the great actor (Trezzini & Bignami, 2007).

It is interesting to mention deeper two aspects: the importance of the great actor and the copyright laws issues. On one hand, the great actors, in addition to being the protagonists of the show, which was seen as an instrument to manifest all their artistic skills, also carried out, in some cases, more administrative and organizational functions, such as stipulating contracts with theaters, choosing the productions to perform and organizing tours.

On the other hand, fundamental to this period, was the approval in 1882 of important changes to the law on the recognition of copyright, to protect the precarious conditions of the authors of texts for the theater. In the same year, the SIA, Società Italiana Autori (Italian Authors' Society), was also founded, and writers, musicians, publishers and even head of the theater joined the society from the very beginning. Even though the life of the society was difficult and troubled, over the years it was transformed into an organization operating in the economic field, becoming in 1927 the current SIAE, which would continue to evolve in the light of new technological developments characterizing, for example, the ease of reproduction of texts, sounds and images.

1.1.1.6 Twentieth century

The theater of the twentieth century is strongly linked and a natural evolution of what happened in the nineteenth century. Indeed, at the beginning of the twentieth century, the theater in Italy was still dominated by the great actor. However, thanks to the "globalization" of the theater and the shows staged by European directors, there was a progressive move towards a directorial theater.

In addition, the shows, both from the point of view of content and technology, began to incorporate, especially after the period of subjugation of fascist culture, all the news from Europe and America.

The post-war period in Italy was full of innovative ferment and it is noteworthy to emphasize that alongside the theater of the tour companies, sometimes in open competition, there was the proliferation of permanent theaters. For example, Stable theaters (Literary translation of “Teatri Stabili”) (including the Teatro Stabile di Genova (1951) and the Teatro Stabile di Torino (1955)) are emblematic examples of theater "as a public service" (Trezzini & Bignami, 2007).

The stable theaters, supported by the money coming from the local authorities, became an example of long-term cultural organization and programming. Moreover, despite the crises that hit them, first of all the youth and cultural

protest that characterized 1968, the stable theaters remain the most solid productive structures of the theatrical system. (Trezzini & Bignami, 2007).

In the meantime, commercial theaters organized itself in entrepreneurial forms and, in the seventies, a distribution system of the theatrical performance was created, with a regional value: in fact, collaborations between theaters located in the same geographical area were established, giving rise to distribution circuits, such as TRT in Tuscany and ATER in Emilia Romagna (Trezzini & Bignami, 2007).

However, we can say that, in general, throughout the 20th century, a series of legislations followed one another, which sometimes completely changed and sometimes only strengthened or adjusted the institutional structure of the main theatrical realities.

History of Theater

Ancient Greek Theater	• Close relationship with the sacred or cathartic-educational functions of the performances. • Characterized by Chorus, Skenè and stage effects produced by specific artifices (mechanè)
Theater in Ancient Rome	• Theater became entertainment. • Romans used two types of curtains: the auleum, located in front of the stage, which was raised and lowered by a mechanical system, and the siparium (Wilson & Goldfarb, 2010).
Theater during the Middle Ages	• This age was characterized by a director, that, from an organizational point of view, it can be considered an antecedent of the figure of the theater manager, which will emerge many centuries later (Wilson & Goldfarb, 2010).
	• In 1637 a theater was opened to the paying public for the first time in Venice (Wilson & Goldfarb, 2010). • Scenography played a central role. • "Special" effects attracted at the courts a crowd of very high-level technicians, who worked in a

Renaissance Theater	coordinated way constituting a sort of "project team" (Trezzini & Bignami, 2007). • Passage from the concept of representation as a unique and unrepeatable event, to the habit of repeating the shows. • A separation of tasks between artistic, technical and organizational staff became more and more evident: the "tertiary sector of the show" was born (Trezzini & Bignami, 2007). • A notarized document sanctioned the birth of the first "company" (February 25, 1545).
Theater in nineteenth century	• Characterized by a new type of organization and industrialization of the show: copyright, stable companies and the role of the great actor (Trezzini & Bignami, 2007). • Approval in 1882 of important changes to the law on the recognition of copyright, to protect the precarious conditions of the authors of texts for the theater. • SIA, Società Italiana Autori (Italian Authors' Society), was founded in 1882, becoming in 1927 the current SIAE.
Twentieth century	• Alongside the theater of the tour companies, sometimes in open competition, there was the proliferation of permanent theaters. • Stable theaters are emblematic examples of theater "as a public service" (Trezzini & Bignami, 2007) • Collaborations between theaters located in the same geographical area were established: the distribution circuits born, (TRT in Tuscany and ATER in Emilia Romagna).

Table 1.1 - History of theater, summary table

1.1.1.7 Current offering

At this point, after an overview of the most significant stages in the history of theater, it is interesting to dwell on the current notion of theater both considering

the main features of this sector and the theatrical products, as well as the theatrical realities active in the Italian landscape today.

The theatrical sector is included in the cultural arts field, consisting of the set of private and public organizations involved in the production and distribution of goods and services of an artistic and cultural nature (Guerzoni, 1998). The theater is part of those organizations in which there is a coincidence between the production phase and the phase of delivery to the public. In this case, we speak of live productions or performing arts. The various forms of theatrical product are Opera, dance and ballet, symphonic and chamber concerts, festivals, reviews and events, prose, pantomime, research and experimental theater, children's theater, puppets and marionettes, poetry readings, operetta, musicals, and cabaret (Argano, 1997).

However, the activity of the theater industry is characterized by economic imbalance. (Nova, 2002). In this regard, for each theatrical institution, whatever its size or position in the market, it is necessary to find a form of management and organization that allows to overcome the limits related to the "law of the market". Briefly analyzing the factors influencing the theatrical market, on the one hand, the demand is relatively limited because the theatrical product presents barriers to understanding and consumption by the public, as it mainly responds to social and artistic purposes and not to commercial needs (Nova, 2002). Therefore, the demographic that represents the target of this market is particularly limited. Secondly, the offer is broad and dispersed over a large number of institutions that are mostly small in size, low in efficiency and highly differentiated.

However, the theatrical product, i.e., the object of artistic production, represents a continuum between the definitions of good and service and consists of the production and staging at the theatrical venue of a live performance (Nova, 2002). The main characteristics of a theatrical product can be summarized in:

- Live realization, the final stage of production coincides exactly with delivery to the audience
- Intangible nature
- Artistic Content
- Orientation towards satisfying predominantly social group interests.

Looking at them specifically, the first, second and fourth characteristics are exactly what distinguish a service, in any field, from a product.

The juridical forms used to exercise the theatrical activity, despite the multiplicity of concrete situations, can be traced to two main categories: Public Entities and Institutions of private law. In the Italian cultural context, the most widespread form is the public one, where the Ministry of Cultural Heritage and Activities controls and coordinates directly or through Superintendencies or other local entities the cultural heritage. The private legal form, instead, can be translated into different possible forms of ownership, from foundation to association or cooperative society characterized by a private legal form (Nova, 2002).

Nowadays, the main offer of theater, is represented by a real theatrical entrepreneurship with a variety of denominations that we recall from (Foglio, 2005):

- National theaters: they respond to cultural purposes for which they propose social tariffs
- Public theaters: they should be considered as public services, therefore as educational and training tools made available for the cultural and spiritual growth of the community
- Stable theaters: they are characterized by the stability of the theater companies and are further differentiated into stable public theaters, stable private theaters and stable theaters of innovation.
- Lyrical theaters: their number is quite small and well distributed in the territory; in this context we have different institutional forms (lyrical-symphonic foundations, historical theaters, civic theaters)
- Private theaters: they are numerous in big cities and present different theatrical offers; besides the social aims they pursue profit, they are particularly careful about costing in order not to run the risk of unsustainable economic situations
- Social theaters
- Municipal theaters
- Cinemas-theaters: very present in the provinces, they alternate the offer of cinema shows with those of the theater with signs agreed upon with local authorities or autonomously

- Social centers and multi-purpose centers: they usually host and produce several theatrical performances; they often offer courses and seminars, creating their own workshops
- Research theaters/research centers
- Residence theaters
- University theaters
- Theaters for young people: the formations that operate in the sector are about 200 (many not subsidized) to which we must then add those amateurs; the offer is addressed to schools and municipalities, however, we are in the presence of a circuit mostly territorial
- Parish theaters
- Theatrical associations
- Theater clubs
- Territorial theatrical circuits.

It is also worth examining stable theaters in detail.

Public stable theaters (Teatri stabili ad iniziativa pubblica) owe their existence to public support, which can be at the municipal, provincial, regional or national level.

Private stable theaters (Teatri stabili ad iniziativa private) are privately managed, but nonetheless carry out cultural and entertainment activities aimed at the community.

Innovation' stable theaters have well-defined cultural purposes, carrying out innovative, experimental and research activities in specific areas.

With regard to the musical offer, then, it is necessary to mention the lyrical-symphonic foundations. The transformation of the lyrical institutions into foundations (D. Lgs. n. 367 of June 29, 1996) has made it possible to adapt the structures of these institutions to a more modern conception and management, more managerial while still respecting the artistic autonomy that these institutions must have. Today we have 14 lyrical-symphonic foundations.

1.1.2 Theater's Management

After this overview about the history of theaters and the current offering, it is time to go deeper into analyzing the management of a theater, considering all the aspects necessary for its functioning.

It is clear that the planning of theatrical organization already existed in the baroque court theaters, in the first theaters open to the public, and among the theater companies of the nineteenth century, although it was clearly not a necessary science as we conceive it today.

In order to introduce the concept of organization and management of a theater, it is quite self-explanatory what Paolo Grassi quoted in his book Quarant'anni di palcoscenico: "I don't believe that the theater should have the same characteristics as a train station. In fact, it is not a problem of timetables of trains leaving and arriving. [...] Organization, in my opinion, is not and should not be an end in itself. Let's be clear, once and for all. Organization does not mean getting an "A" with honors, at the end of the season, because everything that was announced was represented. Organization, if anything, consists in being equipped with tools that allow you to respond with organizational efficiency to what are the supreme reasons for which theater is made."

The theater, understood as a complex organization of people and means, has the typical connotation of a social institution operating in the economic sphere. Indeed, it can be defined as a coordinated system of personal and material resources, organized in accordance with laws and procedures both internal and external to the organization. Moreover, the theater is aimed at the pursuit of a specific social objective (Nova, 2002).

1.1.2.1 Strategic Objectives

In order to start, it is necessary to focus on the objectives of theatrical institutions, which are the core and the main starting point to understand these organizations. At times, the theater is treated in the literature as a nonprofit institution. In fact, it can be said that the main purpose of this institution is not economic, but more cultural and social oriented.

Originally, the theater was born to meet three main objectives: protection of artistic heritage, provision of artistic productions to meet demand and pass on the artistic tradition and development and growth of collective artistic sensibility

in society. In this regard, it could be useful to report the objective identified in the annual report of 1997-98 of the Metropolitan Opera House in New York which stated: "The Metropolitan Opera Association Inc. is a non-for-profit membership corporation [...] organized for the primary purpose of sustaining, encouraging and promoting musical art, particularly opera, for the general public". Therefore, the objectives of the theater company could be summarized in 3 macro classes:

- Social-Artistic: consisting of artistic production and protection of cultural heritage so as to create externalities and added value for the community
- Economic: linked to compliance with rules of economic management such as management and organizational efficiency and effectiveness
- Competitive: for survival in the marketplace. This one has become particularly important during last years, thanks to the development of new technologies which has been making the digitalization and innovation rate of theater a critical successful factor.

These goals may be at odds with each other complicating management and strategic activity within the institution. That is why it is necessary to develop a unified model that allows for positive, bidirectional relationships among institution's main goals.

A valid theatrical organization is absolutely essential for the proper functioning of a theater, and it plays a key role in the achievement of these goals which can be studied in a more specific way, such as:

- supporting marketing strategies and policies
- maximizing sales of products/events in the show
- minimize costs
- getting the most out of the human and financial resources employed.

The organization, in fact, must be able to fully support the offer of the show if it wants to effectively pursue these objectives (Foglio, 2005).

1.1.2.2 Stakeholders

However, before analyzing deeper the organizational structure of a theater, it is also relevant to report the main stakeholders that are intertwined with the institution, which can be classified in four categories.

The first is represented by public bodies, national or local, which often directly represent the ownership of the theater itself when it is a public legal form.

The second category of stakeholders is represented by the employees, but also by the artists who collaborate on an ongoing basis with the theater, representing a major resource.

One of the most important class of entities which have an important interest in the performance of the institution, then, is represented by founding members and private donors who are natural and legal persons, foundations and associations that provide funds to the theater.

Finally, the last category of stakeholders is represented by society, which, on the one hand, benefits from the artistic and cultural service provided by the theaters, and on the other, represents the source of the theater's revenues.

Obviously, since these stakeholders are different in nature, their interests will be divergent. Nova suggests a division of economic interest into a “narrow” and a “broader” sense. In a "Narrow sense”, it refers to the economic interests that are directly achievable and quantifiable in monetary terms, primarily affecting the theater's employees and so-called laborers. In a “Broader sense”, instead, it refers to the direct and indirect economic interests not necessarily measurable or identifiable, typical of both employees and other categories of stakeholders.

In particular, the so-called public capital contributors or public bodies, have as their main indirect economic interest the effective and efficient management of financial resources together with the protection and economic enhancement of the artistic heritage. Private founders, on the other hand, in addition to the effective and efficient management of resources, have among their objectives a return of image and notoriety.

Moreover, it is possible to distinguish the stakeholders listed above on the basis of the nature of their interests with respect to the performance, not only economic, of the theater institution.

Indeed, the community, and, to a large extent, also the employees, are characterized by interests that are predominantly artistic and therefore based on the artistic performance enjoyed by the theater. As far as public bodies are concerned, on the other hand, interests are predominantly political as they are responsible for monitoring institutional constraints by verifying the proper use of the resources provided, since they are mostly public. Private founders and funders, instead, are interested in the economic performance of the institution

and, therefore, in the efficiency and effectiveness with which it is managed, having mainly entrepreneurial goals. Finally, artists and employees who contribute directly to the operational part of the theater also represent the technical structure of the organization itself and are therefore characterized by a managerial role within it.

Consequently, as already mentioned above, it becomes necessary and difficult to find an organizational and managerial system that allows the simultaneous satisfaction of all these interests without losing sight of the main objectives of the theater itself.

These stakeholders can exercise their influence and "governmental" activities in the theatrical institution in different ways. A macro-distinction is made between direct exertion, i.e. through internal organs of the institution, and indirect exertion, i.e. through external mechanisms of influence. The management of the theatrical institution, therefore, can vary depending on the type of organization. Accordingly, in the case of theaters with a public legal form, the management body is typically very restricted and therefore based on the director assisted by the public body of reference. For theaters with management autonomy, instead, the director is supported by a committee of directors and administrators belonging to the reference entity. Finally, as far as foundations, associations or cooperatives are concerned, the administrative body is more structured with the presence of an assembly of members, superintendence, artistic direction and artistic production.

1.1.2.3 Theater's Value Chain

To fully understand the organizational structure of a theater we can consider a generic organizational chart.

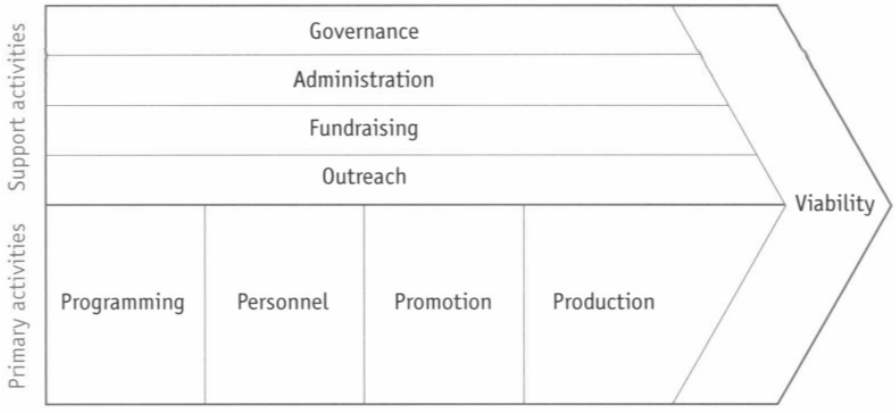


Figure 1.4 - Performing arts value chain (Preece S. , 2005)

The theatrical company is configured as a composite organization, of production and distribution, aimed at the realization of a collective good with strong cultural connotations [...]. The management model, therefore, must separately highlight the two managements that jointly represent the complexity of the company's activity: the management of supply and that of the acquisition (Nova, 2002).

Figure 1.4 represent respectively a typical Porter's value chain of a theater. However, it is worth dwelling on a few points and simplify the analysis considering the activities split in the two macro areas: the "artistic management", which includes the more peculiar activities for a theatrical organization, and the "organizational management", which includes the fund raising and all the other fundamental operations for its well-functioning.

Management of a Theater	
Artistic Management	*Set of operations and processes directly aimed at providing the artistic service of the theater* (Nova, 2002)
Organizational Management	*Set of operations and activities directly involved in the proper functioning of the entire theater organization.*

Table 1.2 - Theater's Management definitions

Artistic management is the set of operations and processes directly aimed at providing the artistic service of the theater [...]. In the case of opera, for example, three main lines of artistic product can be configured: opera, symphonic concert and ballet; similarly, for the prose theater the product lines can be divided into comedy and tragedy (Nova, 2002).

Typical phases of artistic management are:

- Artistic Programming
- Production
- Promotion and Sales
- Live performance

Artistic programming consists of defining the theater's offerings, that is, the program for the following season (Nova, 2002). This activity therefore consists in defining the criteria on which to base the production plan, the cultural and artistic program and the technical and human resources necessary for this program. At this stage, the playbill titles, artists and technical resources needed

are then defined, so as to respect the strategic choices of the institution and its members.

The production of individual shows is the set of operations that allows the acquisition, the aggregation of production conditions useful for the final representation (Nova, 2002). Concretely, this management phase includes some specific activities, such as the acquisition of technical inputs like third-party materials and services, the design and creation of sets and costumes, the identification and selection of artistic and technical mass, and the carrying out of the rehearsals of artistic character and of the preparation of the equipment of scene.

Both the artistic programming and the production are mainly addressed by the artistic direction (direzione artistica), which can be considered the core activity of a theater. On one hand it is responsible for the artistic production of a real show (in the case of theaters characterized by the presence within them of a stable artistic mass), thus involving all the necessary apparatus for the construction of a show, from the direction to the set design department, to the sound and audio technicians, to the actors. On the other hand, it is related to the construction of a seasonal cartel from the artistic point of view, so to the choice of the catalog of shows to be proposed.

Of course, closely related to this part, there is certainly the organizational management (direzione organizzativa), which cannot disregard specific skills for the planning from a more managerial point of view. In addition to these tasks, the organizational direction is also responsible for defining contracts with companies, actors and organizations.

Moreover, the organizational management cannot forget about the functionality and internal integration linked to the ability to dialogue between all areas of the organization, in particular between "the two souls" present within it, that is, the artistic and the managerial (Gilleri, 2008). Therefore, it is essential to have good communication between all the various areas within the theater organization so that, in symbiosis, they can reach the final goal: the staging of the show. It is also important to emphasize that in addition to the need for clear and uniform internal communication between the various organizational units, the system of external relations cannot be ignored. Indeed, it is fundamental for an entertainment company to develop a system of external relations with a triple

vision: with the artistic community, with the company's users, that is, the public, and with all those who support its activities through funding, contributions and sponsorship.

Therefore, in the management of this communication, the marketing sector, the press office, the external relations office and the management of the ticket office are intertwined and work in close relationship (Gilleri, 2008). The press office plays a key role in communicating the flow of information coming from the internal departments towards the media. The external relations office differs from the press office for a whole series of tasks aimed more at communicating the image of the theater not to the media, but to the whole world that revolves around the offer of entertainment, including authorities, public administration, local authorities, associations and artistic-cultural institutions. The ticket office, then, in addition to fulfilling the task of sale, is also an important meeting point for both the occasional and the regular audience. Indeed, with a ticket office, the company opens up to its market by receiving reports, complaints, suggestions, questions, proposals, as well as establishing a fruitful meeting between supply and demand (Foglio, 2005). As we shall see, alongside written and oral communication, digital technologies can play a key role in both internal company communication and external relations.

With regard to communication issues, we can also bring the considerations pointed out by Berend Barkela (Barkela, 2019), who studied leadership in theaters from a communication perspective. He carried out 37 interviews to first- and second-level managers in German theaters to assess the importance of communication in the management of these cultural institutions. This study is focused on three main sets of research, and it underlines three main issues.

First of all, despite managers in cultural institutions attach great importance to it, there is a low degree of systematically internal communication, probably due to the hierarchical structure of German theater and to a lack of appropriate targeted management training. Then, there is separation between artistic, technical and financial areas, which can cause conflicts between people involved in the organization. Finally, both to solve those conflicts and to carry on more efficient strategies within the organization it is needed also a better communication flow.

With this study, it becomes clear that these issues are regarded as important in theaters in Europe, although little systematic attention is paid to them.

Then, going back to the main phases of artistic management, there is Promotion and Sales, which represent all the activities aimed at finalizing the purchase of the theatrical service by third parties (Nova, 2002). This phase of artistic management therefore consists of the issuing of tickets and subscriptions, advertising and promotion in all its forms, press office activities, and the setting of sales prices. In short, they represent the commercial activities related to the theatrical product. This underlines how a valid organizational structure is essential for the implementation and proper functioning of a marketing plan.

Marketing requires the overcoming of the old organizational conception that prefigured rigid and hierarchical structures; therefore, not at all suitable for an evolving society and a demand that takes on more and more diverse forms (Foglio, 2005).

Finally, the last phase is the one of artistic representation, which concerns the delivery of the live show and coincides with the consumption by the audience itself. The main area involved here is the room management (Direzione di sala), which oversees the operation, the maintenance and the cleaning of the hall and the ticket office (Foglio, 2005).

Therefore, observing the management dynamics linked to artistic management, the production activity, representing the acquisition of the resources necessary for the development of the show, triggers negative flows in the financial statements. On the other hand, the live performance allows for a financial return that partially or totally covers the expenses incurred. However, a great impact in terms of flows is linked to another crucial part of the theater's management, namely that linked to fund raising.

Artistic Management	
Artistic Programming	*Defining the theater's offerings, that is, the program for the following season* (Nova, 2002). *Defining a practical and artistic course of action that will be used to select the season's playbill (Università degli Studi di Torino)*
Artistic Production	*Set of operations that allows the acquisition, the aggregation of production conditions useful for the final representation* (Nova, 2002).

Promotion & Sales	*A*ll *the activities aimed at finalizing the purchase of the theatrical service by third parties* (Nova, 2002). *Any steps that are taken for the purpose of obtaining or increasing sales (A.H.R. Delens).* *Those activities designed to bring a company's goods or services to the favorable attention of consumers (Mason and Rath)*
Live Performance	*The artistic representation represents the delivery of the live show and coincides with the consumption by the audience itself*

Table 1.3 - Artistic Management, main activities

Then, the other core area of a theatrical organization, as said, is the organizational management, which includes all the other essential activities for the well-functioning of a theater. In organizational management there are different "sub-categories" of management, i.e., ancillary management, financial management, tax management, human resources management and fundraising.

First of all, there is here the ancillary management, which represents the partial combination for the production of additional economic resources to those derived from the core management. In the theatrical context, such management can be divided into three categories (Nova, 2002):

- Asset management, which refers to the investment of resources in capital assets (e.g., real estate and financial assets) for income generation.
- Technical-artistic management, which consists of the activities that result from the use of the artistic product and the skills gained in artistic management to implement separate and autonomous economic processes. Examples include the sale of rights for filming and audiovisual recordings, the creation of musical and editorial productions and income from licenses linked to the theater brand.
- "Other" management, which is linked to activities such as bars and restaurants inside or connected to the theater, any stores selling objects and gadgets, and the theater museum.

Then we have the financial management, which concerns the set of operations for the acquisition, remuneration and repayment of debts negotiated to cover

financial requirements. In fact, if there are negative monetary imbalances, such management becomes fundamental and necessary.

Finally, tax management includes the set of operations related to the relationships with the financial administration for the discharge of taxes (Nova, 2002). This activity can be carried out internally if the necessary skills are developed among existing human resources or delegated to external consultants. This management, necessary to carry out administrative and legal activities, involves a significant portion of fixed costs for the theater itself, therefore, having an efficient management and organizational structure is fundamental to financial performance.

All of these management activities, which for ease of reading and in keeping with the literature have been described separately in succession, are all combined and interdependent.

Moreover, in order to have a complete picture of the main management activities and resources necessary for the performance of theatrical institutions, it is worth mentioning also the management of personnel, which, in recent years, is gaining more and more importance. This organizational feature, deals precisely with choosing, coordinating and controlling all the personnel hired by the theater. The personnel and consequent skills and know-how available to the institution, represents a key successful factor for the growth of the whole sector. [...] In fact, it is necessary to respond to the current scenario by improving the level of professionalism of employees and by doing everything possible to exploit their potential. Moreover, the change that the scenario imposes on the entertainment industry, requires the presence of new professionalism at organizational, managerial and marketing level; this will obviously require the training of new human resources who are able to fulfill these tasks (Foglio, 2005).

Finally, in the context of organizational management, it is interesting to emphasize the relevance of fundraising, given its crucial importance to the survival of the theater and its complementarity with artistic management.

Fund raising management is the set of operations and processes directly aimed at acquiring the monetary, technical and human resources necessary to carry out the institutional management of the theater (Nova, 2002). Fund raising operations can be divided into two macro-categories in relation to the provider

of such funding: Public funding and Private funding. With regard to the first category, management activities are linked to the relationships with public bodies that can be represented both on a national level by the state and on a territorial level. The request and obtaining of these funds are based on specific requirements to be met, so among the main activities are the preparation of forms and documentation, the verification of rules and standards required by the entity, and the management of relations with the entity itself. Private funding, on the other hand, involves a partially different type of management. In fact, theaters must identify private groups oriented to support culture and then select them. In the selection phase, it is essential for the theater to communicate not only its artistic offerings but also its management and relationships with external funders. However, this form of funding seems to be less common than public funding in the arts sector in Italy.

It is therefore evident how fund raising and artistic management live in a relationship of mutual dependence insofar as each is strictly influenced by and linked to the performance of the other. At the same time, these activities are in some ways complementary: from the technical-economic point of view, artistic management is the prerequisite to produce revenues and to acquire resources. With respect to the monetary process, on the other hand, the resources obtained through fundraising enable the performance of the productive activity that involves the consumption of resources (Nova, 2002).

Organizational Management	
Asset management	*Investment of resources in capital assets for income generation* (Nova, 2002).
Technical-artistic management	*Consists of the activities that result from the use of the artistic product and the skills gained in artistic management to implement separate and autonomous economic processes* (Nova, 2002).
"Other" management	*Activities such as bars and restaurants inside or connected to the theater, any stores selling objects and gadgets, and the theater museum.*

Financial management	*Set of operations for the acquisition, remuneration and repayment of debts negotiated to cover financial requirements.*
Tax management	*Set of operations related to the relationships with the financial administration for the discharge of taxes* (Nova, 2002).
Human resource management	*Set of operations related to choosing, coordinating, controlling and training all the personnel and improving the level of professionalism within the organization.*
Fund Raising	*Set of operations and processes directly aimed at acquiring the monetary, technical and human resources necessary to carry out the institutional management of the theater* (Nova, 2002).

Table 1.4 - Organizational Management, main activities

1.1.2.4 Project management in theaters

It is now worth, in order to conclude this general overview about the management of theater, quoting Lucio Argano's considerations, who considers the planning dimension as one of the most evident peculiarities of theatrical activities. According to him, in fact, every show, festival or playbill is a single project, each time different from the others, even though it is included in repeated schemes, which must deal with constraints related to the coverage of costs, time, quality, use of space and a regulatory system strongly prescriptive. Its realization involves teamwork, where different multidisciplinary skills interact (technical, artistic, authorial and organizational) and must deal with a large variety of different stakeholders. Therefore, it is necessary to resort to theater project management, which Argano considers as extremely important.

According to him, a series of planning and control systems, the timing, the use of resources and the economic and financial management cannot be ignored, with the aim of governing the project in order to reach the final objective. In this way, the theatrical organization can integrate practices and habits traditionally supported by the sector with project management logics that are more adaptable to the particularities of cultural action, always to the advantage of effectiveness and efficiency.

In any case, it is possible to say that the literature on theater management is rather scarce. It mainly offers a general vision of the theater as an organization, which is a point of view now established and quite common for everyone. In literature, it is possible to find something more specific about opera theaters, due to their greater complexity of management than prose theaters. However, in addition to the fact that opera houses are of equal interest to prose theaters for this work, the considerations made about them can be extended to all forms of theaters, since outside of the performance provided, management is almost equivalent.

Management complexity, both for Opera houses and prose theaters, is due to the big number of tasks that have to be executed at the same time and to the need of knowledge both from an artistic and cultural point and also from a more organizational economical and managerial one. Opera Managers, indeed, must simultaneously plan and program their theater's activities over several years horizon times, lead the management teams, foster creativity in the people who design and produce the operas, be able to motivate but also maintain the necessary discipline, while also preventing or settling conflicts as best as possible, dealing with artistic temperaments, passing effortlessly from attention to artistic details to nagging financing problems, or the resolution of labor problems within the house. They must also have skill and personal authority, be good listeners and decision-makers, find the right words, be approachable and put in long hours. But, at the end, their main concern is to guarantee the artistic quality of the operas staged in their opera houses (Agid & Tarondeau, 2010).

Therefore, it is crucial and cannot be neglected the importance and the complexity of managing theatrical organizations, even if sometimes they are neglected.

1.1.3 Digitalization

From the 60s till today, the theater has witnessed a growing fascination with technological instruments that has slowly affected and involved all organizational and artistic aspects of theatrical institutions. Following the Covid-19 pandemic and the consequent lockdowns, in which

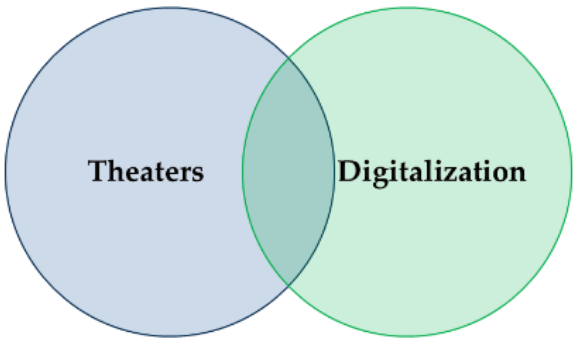


Figure 1.5 - Venn diagram, Theater and Digitalization

theaters were closed for months, the topic and importance of digitization has become even more urgent.

However, it is easy to see that the literature in this field is not rich and does not present a comprehensive view of how a theater can be 360° proofed by digital technologies. This section is aimed exactly at analyzing what the literature actually offers about this topic.

In general, digital technology allows for the greater availability of resources (images, sounds, film clips, written texts and so forth); easier interface between these resources; and a far speedier means of getting from raw idea to finished product. The multimedia age, then, arises from the liberating effects of digital technologies. And these technologies have in turn enabled a techne that is processual, interconnective and non-linear (Lavender, 2006).

It is possible to take, for example, the development of computer technology which is, of course, digital, but it is only a part of a broader turn to digitization that embraces both productive and creative process both management and more organizational issues. However, it is true that the scenography function is the most frequent role given to technology on stage (Menicacci & Quinz, 2001). Indeed, the first and most obvious impact is the digitization of sound, lighting, video-imaging (hence elements of scenography) and show-control systems where clearly speed is of the essence. In a digital domain it is much easier to alter design and technical elements without wasting huge amounts of time, tape or trips to the effects library (Lavender, 2006).

In any case, from creation to consumption, all steps in the theaters value chains have been influenced by new digital solutions. They have brought about new opportunities for innovative practices and new ways of interaction with audiences (De Voldere, et al., 2017).

To analyze the impact at any level of the theater value chain we can take as reference the study "Mapping the Creative Value Chain", conducted by the European Union Publication. From its analysis, it emerges how digitalization have impacted the different core activities:

- At creation level: new technologies often act as an enabler facilitating the creation of works and products or allowing for radically new products or services (such as augmented or virtual reality-based content)

- At production level: fast prototyping solutions (such as 3D printing) have brought new solutions appliable to the stage setting
- At distribution level: radically new models have appeared with the widespread development of streaming solutions
- At marketing level: social media tools and other interactive applications enable to target more fine- grained audience demographics, while potentially aiming at greater audiences
- At management level: software and new digital programs allow to simplify and make faster and more flexible all the activities of management of the organization.

We are therefore going to consider all the stages of the theater value chain and all the main areas in which digital technologies can be applied, to try to understand what has already been (partially or totally) implemented, what can be improved and which benefits can come from digitalization.

1.1.3.1 Organizational and Managerial Applications

The contribution of technological innovation can create added value even in the most technical and organizational areas of the theater. Clearly, we are referring to all those organizational and managerial software that are widely used in almost all sectors and the most complex companies.

Typically, in theaters, the organization of activities is done through the use of basic systems or spreadsheets such as Excel, but the organizational complexity, to be optimized, requires a variety of features. For this reason, the sector is moving to an increasingly widespread adoption of more technologically advanced programs. Along with that, some management tools, such as ERP and CRM, should not be disregarded either.

ERP

ERP (Enterprise Resource Planning), defines a set of business management software modules that integrates all the essential business processes of a company, supporting the planning and control of all resources, integrating the operational and administrative cycle.

With ERP, therefore, we no longer speak of individual systems, but of a single integrated information system. The ERP systems, indeed, include applications for human resources, financial and accounting, sales and distribution, project

management, material management, supply chain management, quality management (Shehab, Sharp, Supramaniam, & Spedding, 2004). Some large theaters have implemented these systems in order to benefit both from resource management and increase their performance thanks to this very powerful tool.

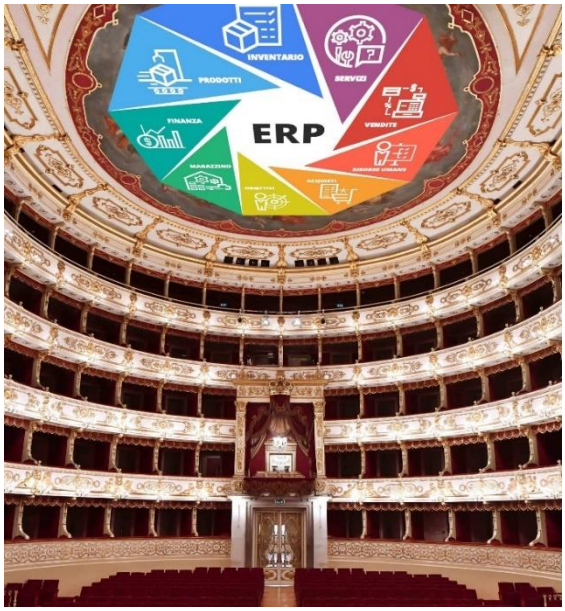


Figure 1.6 - ERP implementation in theaters

These systems brought enormous benefits to organizations such as increased productivity, improve access to accurate and timely information, enhance work flow, reduce reliance on paper, knowledge sharing, tight control, (Bhamangol, Nandavadekar, & Khilari, 2011), as well as automate business processes by coordinating and integrating the information across departments (Monk & Wagner, 2009).

CRM

When we talk about Customer Relationship Management (CRM) we are referring to "an integrated and structured process for managing customer relationships, the purpose of which is to build personalized long-term relationships capable of increasing customer satisfaction and, consequently, of increasing the value of the company for the customer and of the customer for the company".

In other words, CRM can be defined as the ability to acquire customers and have long-term relationships with them. It is a combination of people, processes, and technology in order to understand and obtain customers for the company. To benefit fully from its implementation, companies must have efficient CRM programs to secure loyalty of the customers (Chen & Popovich, 2003). In order to compete with business rivals and keep pace with the competition in today's market, businesses need to have more than just a professionally website; they need to engage and involve users with an encyclopedic system and strategies to support their companies (Chen & Sockel, 2004). Moreover, proper relationships with customers need to be conducted by sophisticated management (Frow, Payne, Wilkinson, & Young, 2011). This is particularly true for theaters, which

are characterized by a very differentiated and widespread public, making crucial the management of the relationships and making necessary the implementation of advanced tools to manage them.

The biggest benefits which could come from the adoption of such tools are related to both effectiveness and efficiency, as they allow organizations to streamline their work and waste fewer time on less productive tasks. Reducing costs, exchanging data and information between sectors, avoiding errors and the waste time, and planning in the long term, are just a few examples of what can be achieved.

Digitized Archives & Logistic Management

Digitization has brought and continues to bring about countless changes in the way archives are built and historical heritages are preserved, therefore it is important to consider also the aspects related to digitalization of archives and of logistic management.

When we talk about digitized archives, we can mainly refer to two main aspects. On one hand, we have the memory of theatrical performances, by which we mean the possibility of preserving their recordings, especially for study and theatrical research purposes, on the other hand, we have the digitization of both historical and digital archives, which allows for easier consultation and management.

Figure 1.7 - Digitilized Archive example, Teatro alla Scala.

We begin by analyzing how the digital advent is changing the "memory" of theatrical performances by referring to an article published in 2013 in the Mimesis Journal by Maia Borelli, entitled "How does the memory of theater change in the digital era?" As the author argues, the digital era is transforming theater studies and allowing a new management of Performing Arts records: the way of searching in archives and libraries has completely changed.

The possibility of recording the performance event, in fact, began to be quite widespread in the second half of the twentieth century, with the introduction of audio and video tapes and 16mm film. Before then, due to the high cost of film production, only very few shows could afford to record their performances.

Therefore, although the history of electromagnetic and digital technologies and mass media is relatively short compared to the millennial history of theater, the evolution and multiplication of forms and formats of performance film has allowed researchers to greatly expand the possibilities of analysis.

The question today is how to refine information retrieval systems by interweaving the work of computer scientists with the wisdom of the theater community. Scholars are trying to identify appropriate models of digital organization of knowledge, and it is important for theaters to participate with their expertise. It is therefore necessary to start experimenting with new instruments that can be used for the digital recognition of images and sounds through, for example, the tools for voice recognition. Also, more experiments can be done for the search of the frame within the audiovisual document and for the creation and organization of open collections and authorial aggregations.

There is still a long way to go for the definition of digital and structured archives, but it is not possible to put it off any longer, both for the need to remain in the forefront and competitive in a world that is more and more digitized, both to make the most of the potential that digital technology offers, such as flexibility, modulation and interactivity.

Alongside this, the digitization of storage and archives also concerns the management of everything that remains once a show has ended. Indeed, a theater that operates with continuity, once a play is over, must have suitable spaces for the storage (momentary in the case of rental and/or permanent) of costumes and stage settings and cannot underestimate the problems related to the management and handling of the stored material (Gallina, Ri-organizzare teatro. Produzione,

distribuzione, gestione., 2016). In this regard, a relevant technology could be the introduction of RFID technology for asset tracking.

Figure 1.8 - RFID managed warehouse. Teatro Regio di Parma

In Italy, the first theater to learn the value of this technology is the Teatro Regio di Parma, which in partnership with Murata ID solutions, introduced it for accurate and real-time tracking of every component of its valuable historical and current theatrical productions.

Technologies, such as RFID, allow to redesign the logistic processes, according to an innovative and data-driven approach, making them more efficient and secure. Its use, therefore, makes it possible to optimize logistical processes, save time and find items moved previously or in different locations.

Particularly important, then, is also the work of archiving and documenting production in function of subsequent shoots or set-ups. Indeed, in addition to a complete administrative archive, it is also necessary to archive all the tools that allow us to reconstruct the show. Among these, we have a script with the complete definitive text, a script with indications on lighting effects, video effects and sound effects, photographic documentation, the complete video recording of the show, lists of costumes, props, props (whether owned or rented) and whatever else is necessary to facilitate subsequent work (Gallina, Ri-organizzare teatro. Produzione, distribuzione, gestione., 2016).

It is clear, therefore, that managing this patrimony digitally brings a number of benefits, including a reduction in the space needed for storage, greater simplicity

in sharing, and a reduction in the risk of information loss. In addition, alongside better internal management of this heritage, digitization also allows for easier and more immediate use of the content by third parties, such as scholars, researchers or simple enthusiasts, obviously if the theater's policies allow it.

Management and Organization

Planning & Control	*ERP* *CRM*
Archives and warehouse management and Logistics	*RFID* *Digitalized archives and heritage*

Table 1.5 - Organizational and managerial digital applications

1.1.3.2 Online customer involvement, marketing & communication

Website

First of all, in the area of online customer involvement, it is important to start with what has become part of everyone's everyday life: internet access. Thanks to this possibility, entrance on web is becoming more and more common among theaters, through the creation of a web page, the presence on social media or the implementation of an App.

Having an institutional web page, can give a great boost to the visibility of the theater, allowing it to expand its audience, keep customers in touch, trying to create a sort of loyalty relationship and simplify some activities for the customers such as ticketing and booking. Traditionally, indeed, this kind of activity could be also done by interacting with the theater through other tools such as telephone and e-mail, but the possibility of booking tickets or other activities directly from the website, as is the case for the vast majority of cinemas and concerts, allows a simplification and a higher level of flexibility of the purchasing process for the user.

Social Networks

Another very important and widely used online tool are social media, which, can play a very relevant role in spreading information about the theater as well as engaging the external community. This has become an important mean

especially among the younger segment of the public that might see the theater as an ancient world that does not speak today's language.

Nowadays social networks represent a very powerful tool for each kind of institution also in the cultural sector. Indeed, they allow to strengthen the word of mouth and spread knowledge and feedback about whatever service or product. This effect has been boosted by the presence of the so-called influencers (SMIs) which recover an important role within the social networks' world.

In order to better understand how social networks can impact a theater, Agostino et. al, conducted a study to identify the influence of different categories of influencers on an institution. Among them, besides the Theater itself, also artists and companies acting as sponsors are the main influencers. While some of the so called SMIs (social media influencers) are strategically involved by the company itself, others do not belong to the institution but their role is crucial inside the network of social media users, having the power to boost positively or negatively the opinion of the other users (Agostino, Arnaboldi, & Calissano, 2019).

The importance of social networks for institutions is confirmed by the fact that, in the last years, many of them have employed the figure of social media managers who are directly responsible for managing both the publishing activities and the interaction with the community. Indeed, also the quality of the social network accounts, which depends on critical factors such as the frequency of publication, the differentiation among the contents, the response velocity, is now perceived as an important feature by the users. Thus, social media are becoming important marketing tools both for advertising the activities and the institution and to collect feedback from the users. To this extent, it has become frequent also the presence of many cultural institutions in ad-hoc platforms for getting feedback from the customers. This is particularly important for theaters where the delivering phase coincides exactly with the moment in which the client receive and perceive the performance.

Mobile App

In addition to this, app development for mobile devices, could further bring the theater closer the current daily life of people. The app, indeed, works similarly to

the social network as a tool for improving the customer involvement and it is becoming must-have tool for the major cultural institutions. Nowadays, theaters' app can include many contents and functions, from the ticketing to the booking of guided visits. The availability of the app and consequently the presence of as many as possible functions and contents for the customer engagement is always more representing a successful tool for the institutions.

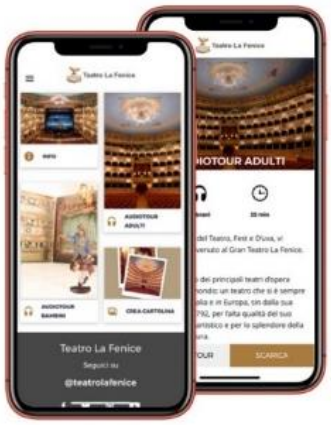


Figure 1.9 - Mobile App example, Teatro La Fenice di Venezia

There is a need, therefore, for theaters to focus on developing these digital tools, from social media to websites to apps, in order to be better aligned with today's social culture and habits and at the same time with the way in which the main service businesses involve their customers. This also allows for the adoption of new marketing strategies, moving from the traditional sponsorship through printed flyers to new types of promotion campaigns, including newsletters and online targeting and advertising tools.

An important example of how digital technologies and new forms of communication could increasingly become part of the life of cultural institutions and, therefore, of theaters, is the creation of a mobile game by the Teatro Regio di Parma. As stated on the website of the theater, "A Life in Music" is the first mobile game in the world created by an opera house. It is a game for smartphones and tablets, available for free on the App store and Google Play Store, built by a collaboration between the Theater, the Verdi Festival at TuoMuseo, an international leader and award-winning in gaming for cultural institutions, the National Institute of Verdi Studies and Sarce, sponsor of the Teatro Regio and a leading company in the field of IT solutions for the digital transformation of companies. The game, after a test of the Italian version in 2019, was released in 2020 in English, Spanish, Portuguese, Russian and Chinese versions, quickly surpassing more than 400 thousand downloads. As the General Director of the Theater, Anna Maria Meo, states, "For the Teatro Regio di Parma it is a real challenge, realized with an innovative language, to cross a new frontier in the communication of tradition, exploring the relationship between the real and artisanal world of the theater and the digital one of virtual gaming. We know the

great potential of gaming in engaging international audiences, and our goal through this tool is to bring together people of all ages, nationalities and cultures, creating an emotional bond and bringing the Teatro Regio and Giuseppe Verdi closer to each person."

This is a sporadic but clear example of how it is increasingly necessary to bring the public closer to culture through innovative and creative solutions, such as the construction of a video game.

Online marketing tools

All these online tools creating new business models through the use of digital technologies. It is not simply a matter of automating or integrating technology into existing processes to optimize the existing value chain, but it is the creation of new business opportunities (Tabuena, 2022). They are widely used by theaters to target new customers in a more efficient way.

Indeed, this leads to new strategies for digital marketing that, with the use of combined technologies, can bring efficient opportunities. Digital marketing encompasses all the marketing efforts using information technology. It includes spectrum of tactics like website marketing, search engine optimization, pay-per-click advertising, e-mail marketing, social media marketing, affiliate marketing, mobile marketing video marketing, content marketing, etc. Digital marketing, therefore, helps in spreading awareness, attracting potential customers, and converting them into buyers. Besides, target customers search information or product or services online by themselves using search engines. (Gupta, 2020).

It is interesting to cite, other than social media, websites, apps and all the other very important and very effective tools, also some other more specific relevant tools that can help the effectiveness of the digital marketing strategy, like the SEO, the web analytics or the remarketing activities.

First of all, there is SEO, Search Engine Optimization, which essentially tweak your website so that it comes up naturally or organically for search results in Google, Yahoo Bing or any other search engine (Bala & Verma, 2018) so to bring organic traffic to your business.

Then it is interesting web analytics, which helps you to collect, measure, understand, analyze, plan, report and predict the web activities for your business. (Bala & Verma, 2018)

Also retargeting is crucial. Retargeting is often referred to as remarketing, but the two are actually considered to have slightly different meanings. Remarketing is a more traditional term referring to process where information collected of a customer is used in marketing to them via mail or email. Retargeting is a more recent term for online advertising methods, where the customers are tagged with cookies when visiting a website and those cookies are then later used for targeting the customer again on online advertising channels. (Kantola, 2014)

Data collection and data management

The online presence of theatrical institutions, in addition to the obvious benefits of awareness and customer engagement, also brings benefits with regard to the collection of data on viewers and on all theater lovers who interface with it.

So, we now turn our analysis toward the possibilities and benefits that digitization brings for customer data collection. Indeed, one potential way to benefit from new digital technologies is to use "big data" to understand where and how audiences can derive more value and then adapt the use of available digital technologies to capture a share of that same generated value (Weinberg, Otten, & Orback, 2019). However, even though the use of big data can help increase the value captured per customer through optimal offerings that improve the value of the experience and also increase the number of customers and capacity utilization of the theater, most theater companies still need to find the resources to analyze their information and implement strategies to capture those sources of value from their customers (Weinberg, Otten, & Orback, 2019).

Critique online

In addition, the online presence of theatrical institutions also changes the way the theater must approach critics and thus creates the need to manage critics online.

According to the article "Theaters in the digital age: how to manage critics and critiques online”: "It is obvious that the ubiquity of social media and other digital forms of communication are now integral to the success of any organization. For arts organizations, and especially for theaters, the ability to cling to traditional forms of criticism and promotion seems to be over. The critic is no longer just a professional and socially respected position. A theater can no longer completely control who says what about a production. Any audience member can now fill the role of theater critic. And their comments are now etched into the fabric of

the internet, seemingly forever. As such, there is an urgent need to understand how an arts organization should best address this new and vocal level of criticism".

The article then argues precisely the importance of adopting a suitable strategy for dealing with all types of criticism, as audience reviews are having a direct impact on the decision of potential audiences. In fact, whereas before the prevalence of the digital sphere, potential consumers could only base their decisions on word of mouth or a professional reviewer's review, they can now find a larger pool of consumer-level critiques to aid their decision-making processes. Thus, many consumers now regularly seek a combination of advertising, critic reviews, and consumer reviews as part of their decision-making processes (Bronner & Hoog, 2010).

Also Preece & Johnson in 2011 analyzed theaters' online interactions with their critics and audience members at 76 theaters selected from the membership list of the League of Resident Theaters (LORT), a nonprofit regional theater service organization in the United States showing the growing importance and interest theaters have in putting on online criticism, at least trying to review comments and criticism from the online community.

Streaming fruition and other remote services

Figure 1.10 - "La Traviata" in streaming during the Covid-19 pandemic, Teatro Verdi di Trieste

The online streaming of a theatrical performance is a quite controversial topic, just because of the ontological character of a representation. It is clear that streaming can never replace the show, but it could be a technology that used in a complementary way allows to reach a wider audience and, above all, those who are unable to physically go to the theater.

Taking up the words of Carpentieri, in the article "Digitalization, digital databases and valorization of cultural heritage", we can indeed consider that it is actually not the "object" of the discipline that changes (i.e., the theatrical performance), but the "discipline" of the object, that is, the discipline of its possible new use, carried out through an innovative means, which complements the traditional ones (i.e., the way the performance is delivered).

In times of pandemic, if on one hand the closure of theatrical activities has jeopardized the survival of theaters and highlighted the precariousness of this sector, on the other hand, it has imposed innovative and alternative ways to generate revenues, among which undoubtedly offering online valorization services has played a very important role.

In this regard, the paper "Filming and changes in the entertainment sectors" published on the SIAE website on 5th March 2021 and drawn up in collaboration with the ASK center of Bocconi University, highlighted how among the emerging phenomena during the lockdown period, the most relevant have been the growth of shows replacing live events and, following the reopening, the provision in hybrid form. Indeed, as the state of pandemic and the strong limitations on live activities persisted, productions specifically designed for an exclusively digital fruition were launched. This is the case, for example, of the main "premieres" of opera houses, co-produced by theaters and RAI. The massive presence of online viewers led to remarkable results: 2.6 million viewers for the "closed-door premiere" of La Scala on Rai 1, in line with the results of the previous year; 654,000 viewers for the premiere of the Barber of Seville at the Rome Opera House on Rai 3, which was followed by "La Traviata"; 30,000 tickets sold symbolically for € 1.09 for the Facebook live broadcast of San Carlo in Naples (with 6,000 comments and 17,000 interactions).

This is of relevant importance because the success of these screenings on TV could lead to a re-evaluation of live performances for the general public. In fact, in Italy, since today, the relationship between theater and television has been

conflicted and troubled and has resulted in the scarcity of programs that have dealt with theater and dance (Borelli, 2013).

Believing in the importance of taking advantage of this new possibility given by online streaming, there is also the Ministry of Culture, which right at the height of the pandemic, announced the birth of a virtual stage: ITsART. This platform, promoted exactly by the Ministry of Culture, together with "Cassa Depositi e Prestiti" was created precisely to disseminate and support Italy's artistic and cultural heritage around the world. ITsART offers an extensive catalog with live and on-demand content available in Italy and abroad and represents one of the most important digital distribution channels for Italian culture. This is just one example that demonstrates how the positive exploitation of new digital technologies can lead to expanding audiences not only in Italy, but also abroad, thus enhancing viewer response.

Alongside online streaming, it is also possible for theaters to enjoy other content online, such as access to historical archives, if digitized, as mentioned before, and the possibility of taking a virtual tour of the theater.

It is worth remembering that the development of an online offer has involved, at the same time, the proposal of new self-produced content and the valorization of archives, repertories and digital catalogs, in an effort to keep a distant audience connected and to approach new segments of users (Centro ASK, 2021). Therefore, online access to cultural heritage can be an opportunity to innovate and to create new forms of fruition and valorization, becoming from "necessity" (in times of pandemic) to "virtue" (usable regardless of the state of necessity, as a convenient and easy way to enjoy culture even at a distance). Many museums, art and cultural institutions have responded to this moment of crisis with rich online programs and initiatives: dedicated projects, conversations, virtual tours.

Of course, even the virtual tour (basic or "enriched") can end with a visit to the bookshop and the merchandising outlet. With e-commerce there is clearly no limit to the online purchase of books, posters, reproductions, various gadgets, with a "click" on the catalog of goods offered for sale (Carpentieri, 2020).

In conclusion, we can say that in addition to filling a gap in the offer in favor of the established public, digital technology has therefore interpreted a horizontal and democratic vision of culture - common to newcomers - breaking down price barriers, acting as a guide to cultural offerings for the less experienced,

facilitating experimentation on the demand side. Although the live experience remains the benchmark of fruition for its immersive quality, it is reasonable to expect that the inclusive value of digital technology will stimulate, in the post-covid era, a rethinking of cultural activities in a hybrid logic. Therefore, we can expect in the coming months the emergence of new formats, new flagship products, and the consolidation of new genres that use combinations of expressive forms, platforms and payment methods in articulated and original ways to satisfy the needs of large segments of the public. This entrepreneurial fervor should be followed with great attention, in the hope that it will be an opportunity to build new markets for cultural work and for the emergence of new professionals in the cultural field, particularly in the live online segment.

However, even though covid has given a strong boost to hybridization and online content publishing, some examples of online streaming in the case of theaters can be seen even before the pandemic. This is the case, for example, of England, where The National Theater's NT Live program of cinema broadcasts reached an audience of 1.2 million people in 2014/15. NT Live is shown globally from Australia and Thailand to Iceland and Chile and is complemented by a wide range of online content. The Royal Opera House also relayed live performances of its opera and ballet productions to thousands of viewers across the country. Moreover, the Royal Shakespeare Company and the National Theater were, already in 2016, among 60 international arts organizations partnering with Google for an immersive digital exhibition allowing online audiences to experience the performing arts in 360 degrees (Department for Culture Media & Sport - UK, 2016).

Online tools	
Customer Engagement and interaction	*Website* *Social Media* *App* *Game*
Online marketing tools	*SEO* *Web Analytics* *Remarketing Activities*

Data Management	*Online critique and feedback management and collection*
Performance fruition	*Online Streaming* *TVs*

Table 1.6 - Online digital tools and applications

1.1.3.3 Onsite digitalization

Technology gave also the possibility to develop many digital tools allowing visitors and spectators involvement and engagement on-site. Many institutions have introduced the usage of QR codes through which it is possible with the personal smartphone to get information and interact, and also totems or touchscreens available to engage people and getting feedback.

Moreover, tablets can be useful tools, which are widely spread diffused in almost all sectors for many different purposes. They are starting to be implemented also in theaters, like in Teatro La Scala. Here, on stage, singers, musicians, assistant directors and managers in every department already use tablets instead of paper during show rehearsals. Moreover, they are also doing other steps ahead towards a greener and more digitalized environment. Indeed, they planned the replacement of the stall's seats during the summer of 2022. The new ones will be equipped with a screen-tablet available to each spectator. These spectator tablets will have all the latest performance information and opera librettos in eight languages.

All these aspects can enhance the onsite customer experience. However, they are not yet well established, and there are only a few sporadic and sometimes not well-systematized examples in Italian theaters of these adoptions. Moreover, there is no research documenting the benefits theaters can derive from these technologies.

1.1.3.4 Technologies on stage

It's appropriate, now, to address another impact that digitization can have on theaters.

We have talked about how digital can help the theater from an organizational standpoint and how online streaming allows for a new form of sharing and

distribution of theatrical performance. However, it is also necessary to shed some light on how new digital technologies can have an impact on the actual theatrical performance. Indeed, as we have already said, the new digital technologies radically transform all the production phases of the performance, from its planning to its stage dimension.

On the one hand, technological development can always improve and bring new innovations to the area of lighting and audio that characterize the theatrical show, on the other, the most sophisticated and recent technologies, such as virtual and augmented reality can become real protagonists, building a show that involves the audience at 360°, in a totally new and unimaginable way until a few years ago.

Lights and Sound

Since the origins of theater, light has played a key role in the representations, for its ability to create suggestions and important scenic effects that support the expressiveness of the actor. After the advent of electricity in the twentieth century onwards, indeed, technologies have always been supporting the show, up to our days in which we even talk about real projects carried out by specialized professions, which are headed by the light designer.

The light designer is a professional figure responsible for the conception and development of lighting projects, with advanced technological skills and ability to use lighting calculation software. In fact, not only today all the lighting systems in theaters are managed in a computerized way, but in recent years technology has made available new tools such as laser beam, fiber optics and motorized multi-effect lights (Gilleri, 2008).

Figure 1.11 - Theater backstage

Reflections on light could be extended to all the new multimedia techniques, video projections, projected scenography, etc. Their use in theater is not very recent, however, but is characterized by the increasing availability of technological supports (such as computer graphics software) and increasingly powerful video projectors (Gallina, Organizzare teatro,

2007). Together with lights, sound management plays a key role on the stage performance. Clearly its importance and the relative importance of the sound engineer, who has the task of taking care of all aspects of it, has different weight depending on the theatrical genre and the show, but from the simple management of music and sound effects of a prose production, it may be necessary to have skills that reach the spatialization of sound, with the use of the most sophisticated digital equipment (Gallina, Ri-organizzare teatro. Produzione, distribuzione, gestione., 2016). Rather than a sound engineer, in some cases, it is possible to speak now of a sound engineer, a term and role stolen from concerts, but used at the highest levels even in prose, and of course in musicals (Gallina, Organizzare teatro, 2007).

Therefore, both with regard to light, music and sound, great technical skills are required, in the presence of increasingly sophisticated and constantly evolving equipment.

VR and AR

Now, we focus on the meaning of digital theater that incorporates the most advanced technologies on stage, such as virtual and augmented reality, so as to enrich the experience for the spectator.

Thus, in this section, we regard digital theater as a varied medium that mixes in-person and online elements to deliver live performances (Lennox & Mason, 2022).

In this way, a notion of an augmented scene emerges (enhanced theater is Dan Zellner's definition of digital theater) that has to do with the real-time processing of multimedia information, the sensory involvement of the audience, and the mediation between performer and computer (Monteverdi, 2013).

The literature provides many different definitions of VR also according to the fact that it can be used in many different application areas.

Fuchs and Bishop (1992) defined VR as “real time interactive graphics with 3d models, combined with a display technology that gives the user the immersion in the model world and direct manipulation”.

Another quite explanatory definition describes VR as “The illusion of participation in a synthetic environment rather than external observation of such an environment. VR relies on a 3D, stereoscopic head-tracker displays,

hand/body tracking and binaural sound. VR is an immersive multi-sensory experience" (Earnshaw, Gigante, & Jones, 1993).

Figure 1.12 - Virtual Reality Theater example, Royal Shakespeare company

Looking instead at a more scholastic definition, virtual reality is a computer simulation of a real situation with which the human subject can interact, sometimes by means of unconventional interfaces, extremely sophisticated, such as glasses and helmets on which the scene is represented and sounds are reproduced, and gloves (data glove) equipped with sensors to simulate tactile stimuli and to translate movements into instructions for the software.

This technology was first experienced in 1962 in US and it is still developed and researched nowadays, and there are a lot of applications of VR in many industries. However, the definitions provided are particularly useful to highlight the main features of this technology that could have a great impact on the digitalization on theaters because of the relevance they could have in this sector. In particular, we refer to immersion, perception to be present in an environment, and interaction with that environment.

Augmented reality goes a bit further than VR, because it can be considered as a hybrid of the real and the virtual. It can be defined as a newer technological system in which virtual objects are added to the real world in real-time during the user's experience. It is an enrichment of sensory perception by images or information (electronically conveyed) that would not be perceivable through the human senses. In AR, real-world scenes are "augmented" by real-time computer-

generated elements and information. These systems, indeed, combine real and virtual objects in a real environment, run interactively and in real-time, register real and virtual objects with each other (Azuma, et al., 2001).

Therefore, a display is required to experience it. Like VR, also AR can be applied to different industries, such as healthcare, manufacturing or entertainment.

Although not as prevalent in the theater environment, these technologies present great opportunities. The possibility to overlay dynamic elements to the physical ones creates, indeed, a new way to build the shows and, moreover, AR and VR allow to have a greater involvement of the audience that can even become part of the show itself. The biggest impact given using these technologies in the theatrical scene is on the relationship between audience members and the experience itself. An example of these uses can be seen in the Dream, a play put on by the Royal Shakespeare Company's that incorporated motion-capture technology and Virtual Reality (VR) headsets in 2021 to give the audience an immersive experience.

Unlike traditional audiences who are separate from the medium - as is the case for proscenium arch theater - Dream audiences formed part of the medium. Their level of involvement in the experience, therefore, was fundamental to their overall sense of engagement and immersion (Lennox & Mason, 2022).

These new theatrical forms which combine new digital technologies with dramatic plays have progressively increasing in the last years and it is referred to as “technodrama”. It basically consists in a play in which the actors on stage interact directly with technological devices (both physical and virtual) and they also involve the audience.

We can also talk about the new possibilities for the design and for the construction of theatrical sets, which are benefited from a widely spread use of 3D modelling software for a more realistic visualization of theater designs (Carver & White, 2013).

In conclusion, we can say that although there is a growing awareness of the importance of digitization, we have yet to see a real 360° implementation of it.

To support we report what was wrote in "Digital Theater. A Casebook": “Too often in our experience, ‘digital’ is consigned to the marketing department. It is seen as a communications activity rather than a part of the DNA of a modern

user-focused cultural organization." "Digital Theater. A Casebook" is a document reporting the considerations and the results of the two-year applied research project European Theater Lab: Drama goes digital set, carried out under the leadership of the European Theater Convention (ETC).

So, according to them, it is important to conceive a digital strategy which can permeate all sectors within the organization. The research also points out what significant progresses are expected in the next few years:

- the use of new technologies to innovate in artistic practice, both online and offline
- the use of new technologies to create, distribute and share experiences with audiences online
- the gathering, sharing and analyzing of data to help improve decision-making, enabling organizations to tailor offers to audiences and increase revenues.

These are of course desirable steps, but we have to be careful, as the paper reminds, that a good digital strategy needs to start with where the organization is today. It should be appropriate to a theater's type and size, its available resources and where it is, and it must consider how new technologies can help achieve wider objectives and how the unique qualities of each theater can best be supported by digital technology.

If there is a small theater, or digital is not yet a major part of what it does, it might identify modest, achievable steps to start with and aim to become more ambitious over time. It will not set digital objectives that are too numerous or wide-ranging. It should focus instead on a few key areas to achieve measurable results with whatever resources are available and always an ambition for excellence. It will also identify what partners the theater will work with to deliver the strategy.

That is crucial and it is also one of the main reasons why conducting an analysis on the actual level of digitalization can have a great impact both for a scientistic purpose both for a more pragmatic utilities for theaters itself, which knowing how are positioned, can decide what to do next in order to become more and more digitally advanced.

Onsite tools	
Customer Engagement and interaction	*Wi-Fi* *QR-code* *Touchscreen* *Interactive totem* *NFC* *AR* *VR*
Live Performance	*VR* *AR* *Light and Sound Technologies* *Digital Scenography*
Artistic Production	*Software for stage-management* *3D molding*

Table 1.7 - Onsite digital tools

1.2 Digital Maturity Assessment

At this point, it is necessary to study the models that have been developed to analyze the level of digital maturity in theaters.

This is of particular importance, because the relevance of these models is progressively increasing because of the rapid growth and speed of technology and, in this regard, their aim is manifold.

First, they set up an assessment instrument meant to provide a descriptive analysis of companies' maturity (Canetta, Barni, & Montini, 2018). This is of particular importance because it allows to understand the ability to navigate in the digital world, reducing the risk of being out of date in the digital contest. Then, they allow to benchmark and compare the organization with the direct competitors and with digital players in other areas whose strategies could be emulated. Moreover, they also give useful information and knowledge that can help the company to understand how to identify factors driving digitalization, barriers preventing it, and also the capabilities required to increase the level of digital maturity. These benefits show how these models can have a

relevant role also in cultural organizations and especially in theaters, since, as covid has made clear, the adoption of new technological solutions is absolutely essential for theaters if they want to survive.

However, what emerged from the analysis of the literature concerning the assessment of the digitalization level of cultural institutions, is that practitioners and academics have significantly focused mainly on other sectors different from the cultural one.

The attention of the literature has been given principally to the manufacturing sector and the impact of Industry 4.0 development. Indeed, even if Digital Maturity models are interdisciplinary frameworks which can be adapted to any type of organization, the literature review has highlighted an important gap. Cultural institutions in general, and theater in particular, are not considered by the literature under the lens of digitalization level outside of the analysis of some specific technologies offered to the audience.

For this reason, having highlighted a substantial gap in the literature on this topic, we are now going to investigate these aspects separately.

First of all, we will focus on performance measurement in cultural institutions and, in particular, in theaters, to see how and why their adoption is relevant.

After that, we will analyze the digital maturity models that have been developed and that are widely adopted in other sectors, trying to understand which are the steps to follow and which are the most relevant dimensions to consider in order to build an ad hoc tool that can be applied to theaters.

1.2.1 Performance Measurement

Performance measurement systems are critically important for cultural institutions, especially when they are associated with quality, governance and accountability (Badia & Borin, 2011).

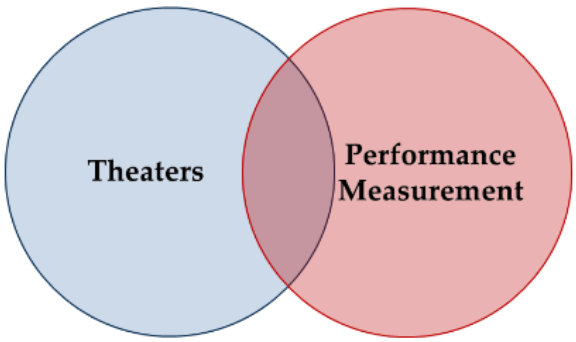


Figure 1.13 - Venn diagram, Theaters' performance measurement

Performance measurement could be seen as a managerial process, which has the goal of supporting the decision-making process (Simons,

1995), linked to the strategic control (Lorange, 1977), with reference to the pursuit of the pre-established goals.

The implementation of a good PM system starts with the identification of the main points of the strategy (or the "mission") of the organization (Badia & Borin, 2011). Differently from traditional business performance measurement systems, cultural institutions should give high priority and importance also to other KPIs than the financial ones. Accordingly, Schuster highlighted the risk associated with using a limited number of indicators in order to monitor performance in the cultural sector.

Historically, performance measurement systems focused on financial measures. Nevertheless, from the 1990s, practitioners and academics began to question the relevance of using solely financial performance measurement indicators. They argue that performance measurement systems should include non-financial indicators, which are deemed to be more directly related to firms' long-term strategy, to be better indicators of managerial effort and to be less subject to manipulation (Turbide & Laurin, 2009). Accordingly, Performance Measurement Indicators can be divided into three different categories, in order to warn of possible loss and variances that might impact the company results and risk profile (Arnaboldi, Azzone, & Giorgino, 2014):

- Value – Based Measures aimed at measuring more holistically value. They include the direct measurement of value and its components such as Net Cash Flow (NCF), Cost of Capital (k) and Terminal Value
- Accounting-based indicators which are based on the financial statements like ROE and ROI
- Value drivers include non-financial performance indicators, resource indicators and key risk indicators. They provide early signals about the future achievement or loss of present value.

Moreover, Arnaboldi suggests dividing performance measurement and management system considering both the internal and external stakeholders involved. The development of indicators concerning external dimension of the organization are particularly relevant for cultural institutions like theaters. Since the mission of performing arts organizations is generally aimed at enriching the cultural environment through artistic achievement, the performance measurement system they use should put more emphasis on the quality of live performances or customer satisfaction than on financial metrics (Turbide &

Laurin, 2009). So, even if the economic and the financial aspects are still key issues for theater management, it is necessary to combine the financial needs of the cultural institution with the needs of the prospective visitors and spectators in order to be focused on the quality of the overall experience.

Performance measurement systems might work as useful tools to improve theater's capacity to reach objective and the main dimensions that that probably should be addressed are financial, artistic activity and audience satisfaction. Artistic quality is found to be the main success factor and the audience and the community to be the most important stakeholders, while the main reason for implementing the current performance measurement system is financial accountability (Velli & Sirakoulis, 2018). However, the indicators in those systems should be adapted, to some extent event tailor-made, on the characteristics of the performing arts institutions. Indeed, according to most studies in this sector, those indicators should measure theaters' performance both at the qualitative and at the quantitative level.

Summing up, they should be multi-dimensional, which means that they should consider both monetary and non-monetary factors and qualitative variables, taking into account also management and strategy issues (Badia & Borin, 2011).

Even if performance measurement systems could give different benefits to theaters such as a contribution in the decision-making process and a support both in the internal and external reporting, they are not so easy to be implemented. Indeed, they could present high costs for the organization, and they should also present a certain degree of flexibility. Moreover, there is the risk that using too many indicators they result to be too much complicated and so ineffective, so it is important to find an appropriate balance and carefully choose the variables that have to be monitored.

When Performance measurement is adopted, independently from the sector analyzed, relevant concepts to be considered are efficiency and effectiveness. With efficiency we refer to the best possible relationships between inputs and outputs (Gratton & Taylor, 1992). Moreover, the concept of efficiency related to the cultural sector should be related to the social impact. Tow suggests that the social efficiency case for intervention in the market is basically that free market forces cannot work to provide the socially optimum outcome, so it relates to what is socially desirable. With effectiveness, instead, we refer to the extent to which objectives are met (Erlendsson, 2002).

Theaters, and performing arts institutions in general, should therefore try to reach their institutional goals using in an effective way the available resources (Badia & Borin, 2011). Effectiveness, as Badia and Borin claim, has been addressed as fundamental also by legislation. Indeed, according to the law, theaters should not only present a plan of their activities (both in the short and in the long run) but they should have also a reporting system for their management that should include both planning and budgeting.

Thus, management control techniques are important to ensure financial stability and to reach the objectives of efficiency and effectiveness. In particular, auditing practices as part of those techniques prove to be a crucial step to understand how a theater could improve its performance in the long run (Badia & Borin, 2011).

A case interesting to consider is the performance measurement model in cultural organizations proposed by Gilhepsy in "Measuring the performance of cultural organizations: a model", which is based on the strategic choices available to managers of cultural organizations. In particular the most relevant Policy Objectives identified by the model are the following:

- Access Maximization
- Attendance Maximization
- Diversity/Multiculturalism
- Economy Maximization
- Education
- Excellence
- Innovation
- Revenue Maximization
- Service quality Maximization
- Social Cohesion.

Additionally, in this model, which is based on the abovementioned concepts of effectiveness and efficiency, the social impact of the institution is considered as important as financial KPIs.

It could be useful for these organizations to understand their relationships with its customers, funders, artists and peer organizations and with the community at large, since the sharing of values with an external constituent can serve as a basis

for relationship building and subsequent financial support (Morgan & Hunt, 1994). For organizations to thrive in an industry marked by high rates of artistic innovation and largely unpredictable customer preferences, their managers must seek out new sources of revenue, new ways of operating efficiently and new tactics for increasing attendance (Voss & Voss, 2000). Innovation, indeed, is one of the critical successful factors for every theater both for what concerns the on-stage activities and the customer involvement, but also within the organization to achieve a competitive advantage in managerial and administrative activities. The necessity for a high innovation rate is significantly accentuated by the raise of new technologies and the digitalization trend which is impacting each sector. Moreover, being theaters performances directly related to customers' perception, it is necessary for these institutions to provide services and be in touch with the market according to the pace of the digital evolution.

To this extent, it would be useful to measure theaters' performance in terms of digital readiness both as a benchmarking with the other institutions and also to identify areas of improvement to prioritize investments and activities.

1.2.2 Digital Maturity models Literature Review

The literature provides many examples of quantitative and qualitative models developed in order to measure the level of digitalization of an organization. These frameworks are known as Digital Readiness or Maturity models.

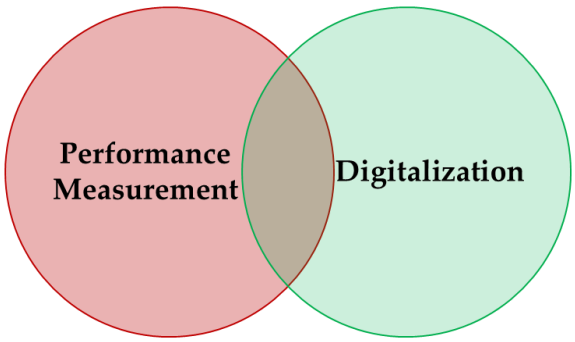


Figure 1.14 - Digital performance measurement

It is worth clarifying that "readiness" and "maturity" generally are used interchangeably in extant literature to represent the same set of concepts (Pirola, Cimini, & Pinto, 2019)). The readiness concept refers to "the state of being both psychologically and behaviorally prepared to take action, i.e., willing and able" (Weiner, 2009).

Accordingly, a readiness assessment aims to identify risks, opportunities and potential challenges that might arise when change processes, concerning new processes, procedures, organizational structures, are implemented within an

actual organizational context. Moreover, this analysis also aims to identify any potential barriers to success, thereby allowing the organization to address them before beginning the change project (Pirola, Cimini, & Pinto, 2019).

Maturity models are commonly used as an instrument to conceptualize and measure maturity of an organization or a process regarding some specific target state (Schumacher, Erol, & Sihn, 2016). According to Deloitte, a Digital Maturity model is an effective tool to provide guidelines for a clear path throughout the transformation journey. Therefore, maturity models, like readiness assessment models, also help address the objective and impartial evaluation of a company's position, as well as answer questions such as what needs to be measured and how to assign a specific stage or degree of maturity (Becker, Knackstedt, & Pöppelbuß, 2009). The typical purposes of use for maturity models are classified in (Pöppelbuß & Röglinger, 2011):

- Descriptive: a maturity model serves a descriptive purpose of use if it is applied for as-is assessments where the current capabilities of the entity under investigation are addressed with respect to given criteria (Becker, Knackstedt, & Pöppelbuß, 2009)
- Prescriptive: If it indicates how to identify desirable maturity levels and provides guidelines on improvement measures (Becker, Knackstedt, & Pöppelbuß, 2009)
- Comparative: Given sufficient historical data from a large number of assessment participants, the maturity levels of similar business units and organizations can be compared (Bruin, Ron Freeze, Kulkarni, & Rosemann, 2005)

The models presented by the literature review concerns mostly the manufacturing sector and the organizations' capability to include digitalization both in the organizational structure and processes. Indeed, the manufacturing sector has been particularly interested by the Industry 4.0 development which has increased the necessity to evaluate the digital maturity of a company according to different levels and stages of implementation and according to different corporate areas.

We recall in Table 1.8 the main digital readiness models related to Industry 4.0 that we analyzed in our work.

Digital Readiness Models (Industry 4.0)	*Authors*	*Dimensions*
Digital readiness assessment of Italian SMEs: a case-study research	*Pirola, Cimini, Pinto, 2019*	*Strategy, People, Processes, Technology, Integration*
The Digital Maturity Model 4.0	*Gill, VanBoskirk, 2017*	*Culture, Technology, Organization, Insights*
A framework for Assessing Manufacturing SMEs Industry 4.0 Maturity	*Alfonso Amaral, Paulo Peças, 2021*	*Change, People, Production processes, Technology, Organization, Smart Products*
A Maturity model for assessing the digital readiness of manufacturing companies	*De Carolis, Macchi, Negri, Terzi, 2017*	*Design and Engineering, Production management, Quality management, Maintenance management, Logistics management*
A maturity model for assessing Industry 4.0 readiness and maturity of manufacturing enterprises	*Schumacher, Erol, Sihn, 2016*	*Strategy, Leadership, Customers, Products, Operations, Culture, People, Governance, Technology*
Digital Maturity Model	*Deloitte, 2018*	*Customer, Strategy, Technology, Operations, Organization & Culture*

Table 1.8 - Digital readiness Models, literature review

These types of models can be used by institutions in order to prioritize actions for improvement and also as a benchmarking tool for comparing the positioning against other organizations in the market. Consequently, frameworks for assessing the digital level of organizations are usually based on a multi-dimensional approach considering different areas and activities, from the corporate strategy to the value proposition and the management activities.

The DRL 4.0 (Pirola, Cimini, & Pinto, 2019) is based on five dimensions of analysis which are:

- Strategy: based on the strategy of the company with respect to digitalization and the adoption of Industry 4.0 principles
- People: skills, competences and know-how inside the company
- Processes: related to how internal processes are managed from a digitalization point of view and how data alle collected, shared and managed
- Technology: current adoption of the Industry 4.0 enabling technologies
- Integration: Digitalization level and integration with other actors of the value chain.

According to these dimensions, different case studies of Small-Medium Enterprises are evaluated to build up a weighted score and consequently rank and classify them in different stages of digitalization based on the development of ad-hoc Key Readiness Indicators for each examined category.

Based on the assumption of predictable patterns of evolution and change, maturity models usually include a sequence of levels (or stages) that together form an anticipated, desired, or logical path from an initial state to maturity ((Becker, Knackstedt, & Pöppelbuß, 2009), (Gottschalk, 2009), (Kazanjian & Drazin, 1989)). Indeed, maturity models assume inherently a predictable pattern in order to represent how firms or institution (in different areas and thus according to different capabilities) evolve among different stages of maturation (Pöppelbuß & Röglinger, 2011). Consequently, examined entities are divided in different stages which follow a sort of bell-curve depending on the digitalization and innovation rate in which the examined institution lasts.

As representative examples, (Brozzi, Riedl, & Matta, 2021), in the article "Key Readiness Indicators to assess the digital level of manufacturing SMEs" identify three possible levels as follow:

- Digital newcomers (low)
- Companies in transition (medium)
- Top performers (high).

A more complete taxonomy according to the digital maturity level is provided by Gill and VanBoskirk in the article "The digital maturity model 4.0", who identifies four different levels as briefly described below:

- Skeptics who do not believe digital disruption matters on them thus designating the digital development usually as a low priority

- Adopters
- Collaborators who support aggressive investments in innovation and marketing technology through their large marketing budgets
- Differentiators whose mature digital business integrate their marketing, customer experience and insights teams to create customer centric experiences.

In order to understand which procedure to follow to assess the level of digitization of a company we can take as an example (Canetta, Barni, & Montini, 2018). This paper introduces a framework developed in three steps which, in this particular case, addresses the digital level in manufacturing companies, but which can be easily readapted for other sectors.

The first step consists in carrying on a digitalization maturity assessment based on a questionnaire with particular reference to strategy, processes, products and services, technologies and personnel. Subsequently, the second step is basically a process related analysis which provides an in-depth focus on the processes that, through the analysis done in the previous step, resulted to be more strategic for the journey of the company. Finally, the last one consists in an activity-based requirements which provides an analysis of the activities carried out within each process to define how the integration of technologies and digital methods, brings to a change in the working conditions and related skills.

1.3 Literature gap and research questions

After studying these macro areas, which are the necessary basis for a better understanding of our work, it is appropriate to make some considerations by picking up on the main gaps that we found in the literature available to date.

First of all, if on one hand there are few papers that report a complete view of the management of a theater organization, on the other hand there is a complete lack of research on digitization in theaters at 360°.

Indeed, it is possible to find articles or papers that address some very specific technological innovations, such as AR or VR on stage or the ability to deliver shows online, which has been given a strong impact by the advent of the recent pandemic of Covid-19, but there is no literature that focuses on digitization in all areas, from the back office to the onsite experience for the customer.

Furthermore, for all those technologies such as CRM and ERP that are widely deployed in other industries to manage complex businesses like theaters, there is no research that highlights the benefits their adoption can bring to cultural institutions.

Alongside this fragmented and not at all efficient view of digitization in theaters, then, there is another major shortcoming. It is not possible to find any model for measuring digital maturity in theaters, even though such models have been widely studied and are being developed and adopted in many sectors, most notably in the manufacturing one.

Evaluating the digital maturity of theaters is fundamental for two purposes. First of all, it is useful for the theater to understand its weaknesses and what to focus on when defining a plan of action for the future. In addition, assessing maturity then can be used as a benchmark for comparison with other theaters in order to understand how to make continuous improvements.

Indeed, it is increasingly urgent for theaters to remain competitive and the only way to do this is to embrace what new technologies have to offer, as has been made clear by the pandemic.

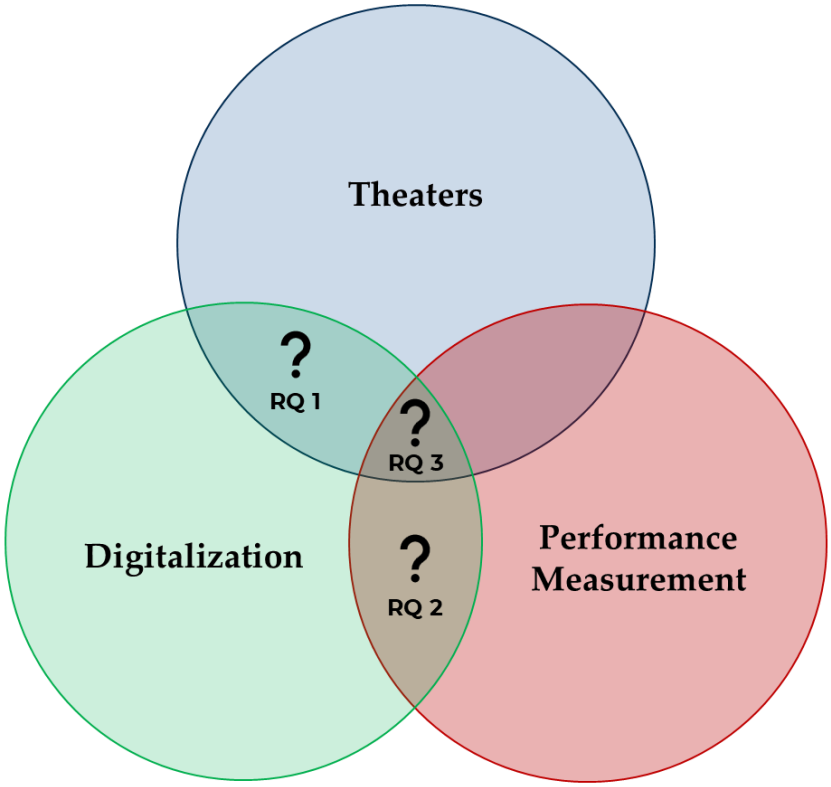


Figure 1.15 - Literature Gap and Research Questions

From these two important gaps, therefore, comes our thesis work, which aims to develop a model for measuring the level of digitization in theaters, answering the following research questions:

- RQ1_ Which are the digital transformation dimensions in theaters?
- RQ2_ How is it possible to assess each of these digital transformation measures identified?
- RQ3_ How is it possible to synthetize all these dimensions into a single index?

This model was then applied and validated on the Italian case, going on to assess the level of digitization in Italian theaters.

2. Methodology

This chapter aims to illustrate the methodological procedure that was followed throughout the research work on this thesis. The goal is to give the reader a clearer and more transparent view of the choices that were made.

In particular, we will analyze in detail the scientific approach adopted for the analysis of the literature, for the construction of the survey and for the study and analysis of the data collected.

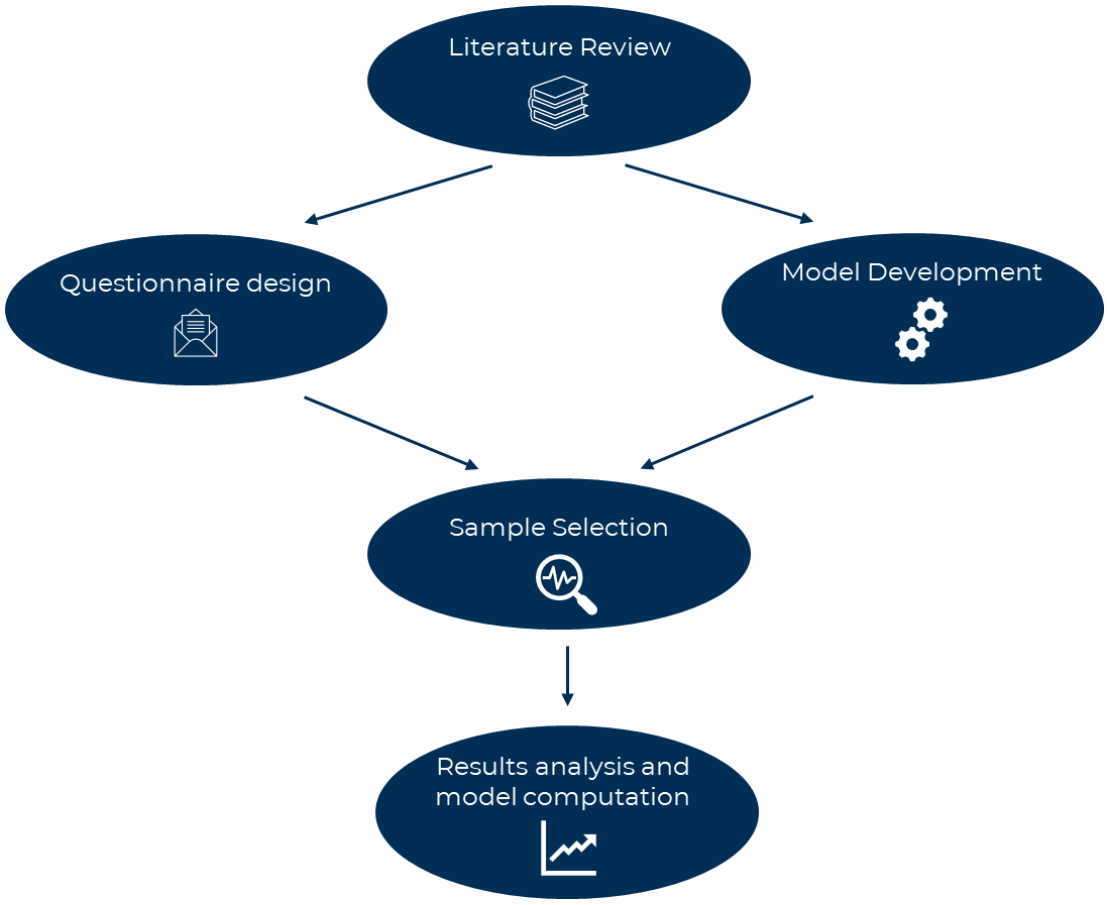


Figure 2.1 - Methodology Framework

2.1 Literature Review

To perform the literature review, we first chose to adopt a scoping approach. The scoping review has become an increasingly popular approach for synthesizing research evidence ((Davis, Drey, & Gould, 2009), (Levac, Colquhoun, & O'Brien, 2010), (Daudt, Mossel, & Scott, 2013)).

Scoping studies (or reviews) may be defined as "preliminary assessment of potential size and scope of available research literature. Their aim is to identify nature and extent of research evidence (usually including ongoing research)" (Grant & Booth, 2009).

We decided to adopt a scoping literature review, rather than a systematic approach, given the breadth of the subject matter and the heterogeneity of the topics. Indeed, the adoption of the scoping approach is preferred to the systematic one, when the object of the work is to present an overview of a potentially large and diverse body of literature pertaining to a broad topic. So, this choice was crucial for two reasons. On the one hand, it allowed us to map the different fields of study and to visualize the range of material available, given the multitude of topics we touched upon. On the other, it made it possible to identify some gaps in the existing literature.

To carry out a structured and coherent work we decided to follow some steps based on the model developed by Templier and Parè (2015):

1. Formulating the research question(s) and objective(s),
2. Searching the extant literature,
3. Screening for inclusion,
4. Classify and summarize the research done

Of course, even though steps are presented here in sequential order, it is important to remember that the review process can be iterative and that many activities can be initiated during the planning stage and later refined during subsequent phases (Finfgeld-Connett & Johnson, 2013), (Kitchenham & Charters, 2007)).

2.1.1.1 Formulating the research question(s) and objective(s)

First of all, we defined the research question(s) and the objective(s) of our Master Thesis that can be classified and summarized as follows:

- RQ1_ Which are the digital transformation dimensions in theaters?
- RQ2_ How is it possible to assess each of these digital transformation measures identified?
- RQ3_ How is it possible to synthetize all these dimensions into a single index?

Obviously, in order to be able to investigate these research questions as precisely and comprehensively as possible, it was also necessary, before focusing on the theater's relationship with digitization, to make an in-depth study of the general theatrical context, both considering its evolution over time and its management and organization.

2.1.2 Searching the extant literature

Having identified the research areas, the process of literature search, analysis and selection has begun. Figure 2.2 represents the main steps that have been followed in our work:

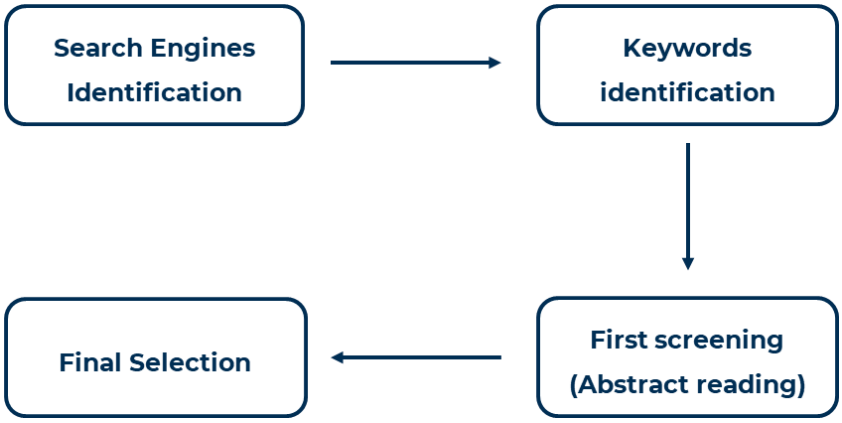


Figure 2.2 - Literature research methodology

To search the extant literature on our areas of investigation we have mainly used three search engines: Scopus, JSTOR and ProQuest.

The choice of these three tools allowed us to find high quality papers, including articles, conference papers and book chapters.

Obviously, to find also other equally relevant sources, we checked the reference list of the papers we read.

Moreover, since research on theaters and, in particular, on their relationship with management and digitization is still rather scarce today, we also consulted the websites of accredited Italian institutions, such as the Ministry of Culture's (MIC)

"Osservatorio dello Spettacolo dal Vivo", Siae's website and all those research organizations whose focus is on the analysis and development of this sector, including the "Osservatorio dello Spettacolo dell'Emilia Romagna" and the "Osservatorio dello Spettacolo del Veneto".

In addition, to further expand our research, we used books and journals related to the themes of interest, found thanks to the inclusion of key terms in the online catalogs (OPAC) of libraries such as Biblioteca Panizzi" – Reggio Emilia, and "Biblioteca Nazionale Braidense" – Milano.

2.1.3 Screening for inclusion

After having selected as main search engines Scopus, JSTOR and ProQuest we have chosen to adopt two approaches in parallel: the adoption of keywords and the selection of precise filters using the advanced features of these search engines.

Table 2.1 summarize the Query with the main Keywords adopted in the search engine and the correspondent total number of results obtained. Consequently, we have analyzed the relevance of the documents to get a second screening thanks to the abstract of the main documents identified. Finally, the ones considered most relevant for the purpose of the Master Thesis have been selected and included in the literature.

Table 2.1[1] summarizes the keywords used (the same in all the three search engines) and the number of papers found, read and selected using the different database which give the most representative picture of the literature situation.

Keywords and related Query	**Results on Scopus**	**Results on ProQuest**	**Results on JSTOR**	**Abstract read**	**Selected papers**
"Theater" AND ("Management" OR "Organization")	1605	1747	499	81	14
"Theater" AND ("Digitalization" OR "Technology" OR "Digital")	1642	3945	41	240	26

[1] The table contains the relevant query and results. The remaining part of Bibliography is related to other sources or query

"Theater" AND ("Digital Readiness" OR "Digital Maturity")	1	18	1	6	0
"Digital" AND ("Readiness" OR "Maturity") AND "Model"	2120	1106	876	60	16
"Performance" AND "Measurement" AND ("Theater" OR "Cultural Institutions")	53	56	13	15	5

Table 2.1 - Literature research results by search engine

Then, the selection of the "filters" was fundamental in order to decrease the number of articles not inherent to our research, especially in the area of management and digitization of theaters, because otherwise papers concerning operating rooms - in English also called theaters - would often emerge.

The filters were selected according to subject area, as reported in the Table 2.2.

Search engine	**Selected Filter(s)**
Scopus	LIMIT TO (SUBJ AREA ("Arts and Humanities" AND "Economics, Econometrics and Finance" AND "Business, Management and Accounting"))
Proquest	LIMIT TO (SUBJ AREA ("Cultural Studies" AND "Management & Organizational Behavior" AND "Marketing & Advertising" AND "Performing Arts" AND "Business" AND "Technology"))
JSTOR	LIMIT TO (SUBJ AREA ("Theater" AND "Decision Making" AND "Art" AND "Culture" AND "Information Systems" AND "Innovations"))

Table 2.2 - Selected filters by search engine

However, it is relevant to note that it was difficult to find academic papers on the subject, especially in the sections "Theater Management" and "Theater digitalization", so the use of other sources such as books in libraries was essential.

This is also confirmed by Table 2.1. Indeed, it is worth observing that:

- No literature is present about existing Digital Maturity model for theatrical institutions
- Theater Digitalization: only 1,6% of the total results have been considered relevant and reliable for the research

- Performance Measurement in Theater and cultural institutions: there are very few documents related to this field
- Theater Management and Organization: Less than 1% of the found papers were useful for our project.

2.1.4 Classify and summarize the research done

After having selected the most relevant papers useful for our research, we have classified them in an Excel paper, reporting the title, the name, the year, the authors, the publisher, a brief summary of the content and the reasons why it could have been useful for our work. Moreover, we associated to each of the paper an ID based on the area of content in order to simplify the work of research and recall of the same documents.

2.2 Questionnaire design

Once the literature review was completed, we continued with the creation of a survey to be administered to a sample of theaters with the aim to assess the level of digitization of theaters at national level. This step, in order to design the questionnaire properly for the purpose of the research, was conducted in parallel with the development of the model dimensions and indicators.

A questionnaire is a method used to gather information from a sample of individuals. The choice of a questionnaire is critical to gathering data and information relevant to the research, as well as being a simple and effective method of reaching respondents.

The construction of the content of the questionnaire clearly started from the literature review done in the Chapter 1.

Actually, besides the results of the literature review, we also analyzed the Porter's value chain of a generic theater and some organizational charts of the larger theaters, in order to be able to cover all the most relevant areas in which to assess the impact of digitization.

So, we came up with the following eight sections:

1. Digital Investments
2. On-line Customer Experience

3. On-site Customer Experience
4. Ticketing
5. Marketing
6. Logistic and Space Management
7. Human Resources
8. Multimedia.

After identifying the areas of investigation and thinking about the most punctual aspects to be examined, we then submitted our work to two experts in the field: the Director of Communication and Marketing of the Piccolo Teatro di Milano - Teatro d'Europa- and the General Manager of Fondazione Teatro La Fenice di Venezia.

The comparison of the research carried out up to that point with two experts in the field was a key step in order to go on in the definition of the questions and to be able to focus on the most important aspects.

After that, once we had identified the precise content of the questionnaire, we dedicated ourselves to writing the questions in precise language and as simple as possible, so as to be clear in the requests and to minimize the ambiguity for the users. The form is, indeed, of fundamental importance to reach respondents in the most direct way possible because it is through this that theaters will relate to our survey. It is then absolutely necessary, in order to have reliable results, that the questions are understood by all respondents in the same way.

In addition, we have avoided using language that is too technical and we have also made an effort to include some relevant explanations to avoid misunderstandings.

The language chosen for administration is Italian, since the sample consists exclusively of a set of Italian Theaters. Relatedly, we took special care to provide every concept in Italian, and, where it was not possible because some technologies may be well known only in English, we clearly explained the concepts we were referring to.

It was preferred the adoption of closed-ended questions and filter questions were included. Filter questions are useful tools in order to avoid a too long questionnaire and, consequently, possible errors in the response due to lack of attention of respondents.

Summarizing, in the formulation of the questions we tried to be objective, neutral, explicit and, at the same time, specific.

In this regard, it was very useful for us to compare our survey with other questionnaires on the digitization of museums administered by the "Osservatorio Innovazione Digitale nei Beni e nelle Attività Culturali del Politecnico di Milano", given the similarity of certain questions.

The final version of the questionnaire, consisting of 55 questions (including biographical questions) was then administered through CAWI (Computer Assisted Web Interview) methodology. This type of administration is actually a data collection methodology that relies on the completion of a web-based questionnaire provided through a link, panel or website.

The questionnaire was, indeed, uploaded to the Opinio software, and then the invitations were sent by email, which is perhaps the most suitable survey technique for involving organizations, foundations, and associations for a widespread campaign on the chosen population.

The email was clearly accompanied by a clear presentation of the survey, as was the initial page of the questionnaire, where the privacy statement was reported, to obtain an informed consensus, and also information about the possibility for all respondents to receive the results of the analysis in aggregate and anonymous form.

Although adopting the CAWI methodology causes the risk of losing the attention of the respondent, who could forget or ignore the questionnaire, thus increasing the risk of obtaining incomplete surveys, the benefits of adopting this solution are nonetheless varied, especially in terms of reducing the time and cost involved in its administration.

The administration was opened on March 7, 2022 and lasted until May 6, 2022.

2.3 Sample selection

After that, it is important to emphasize the process that has been followed to build a valid and meaningful sample on which to test and validate the model built in this Master Thesis research.

First, it is necessary to underline that the model has been applied to an Italian sample for a twofold reason: on one hand, because of a practical need for

response collection and, on the other hand, because of the fundamental importance that the cultural sector and, therefore, theater, has in this country.

However, even though culture plays a fundamental role in the Italian economy, as we have also pointed out in the literature review section, there are no in-depth studies on theaters in Italy, and there is also a lack of recent research and analysis that actually census the population. Indeed, any recent study that wants to find quantitative results on the sector is never focused on the analysis of real theater organizations, with a permanent establishment and staff employed on a continuous basis. The Osservatorio dello Spettacolo, a study and data collection center of the Italian Society of Authors and Publishers, for example, monitors the activity of the performing arts and entertainment industry in Italy across the board with analyses involving concerts, cinema, theater, opera, musical comedies, dance, exhibitions, sports, and traveling show attractions. However, although it publishes semi-annual research on theater business trends, it considers research variables such as number of performances, number of admissions, box office spending, and audience spending, and does not go on to actually survey theaters permanently operating in the country. In addition, again on the SIAE website, there are lists of venues devoted to the dissemination of live entertainment, which have been surveyed because they have paid the fee due for copyright, so it also includes squares, arenas, and stadiums that cannot be evaluated with the model proposed by this Master thesis.

For these reasons, given the need for precision and availability of elements in the construction of the sample, it has been decided to refer to the ministerial decree issued on July 27, 2017 by the Ministry of Cultural Heritage and Activities and Tourism regarding "Criteria and modalities for the disbursement, advancement and liquidation of contributions to live entertainment, under the Single Fund for Performing Arts[2] referred to in Law No. 163 of April 30, 1985." Such a precise and specific choice, especially since this is the first time the model has been tested, allows for reliable, reproducible and valid results.

This decree, in fact, states verbatim that "The Ministry of Cultural Heritage and Activities and Tourism through the General Directorate of Entertainment, shall grant contributions for three-year projects, accompanied by programs for each year, of musical, theatrical, dance, circus activities based on the Fund's

[2] FUS

allocations. The live performance activities considered are those of a professional nature related to production, programming and promotion.

Specifically, among the categories identified by the decree, those considered in constructing the sample for this Master Thesis are as follows:

- National Theaters (Teatri Nazionali), which, for the sole purpose and effect of this decree, are defined as those bodies that carry out theatrical activities of considerable national and international prestige and are distinguished by their tradition and historicity.
  In order to be included in this category, theaters must perform a minimum of 240 acting days of production and 15,000 working days in total during the year.
- Theaters of Significant Cultural Interest (Teatri di Rilevante Interesse Culturale (TRIC), which, for the sole purpose and effect of this decree, are defined as those bodies that carry out theatrical production activities of significant cultural interest predominantly within the area of the region to which they belong. To be included in this category, theaters must carry out the total of a minimum of 160 acting days of production and 6,000 working days in the year.
- Traditional Theaters (Teatri di Tradizione), which, according to Article 28 of Law No. 800 of August 14, 1967, are defined as those theaters that demonstrate a particular impetus to local artistic and musical traditions, and the status of orchestral concert institution to those institutions with stable or semi-stable ensembles of a professional nature that perform at least five months of activity annually. In order to be eligible for the grant, they must carry out production and hosting activities of operas, with a minimum of eight performances, spread over three shows. They can, in addition, carry out concerts and dance performances, including with music on recorded media. Moreover, the theaters must register annual revenues from territorial or other public bodies of not less than forty percent of the state contribution.
- Lyric Symphonic Foundations, for which, as far as the criteria for the allocation of the FUS contribution are concerned, the Ministerial Decree of February 3, 2014 is in force. Lyric-symphonic foundations were initially governed by Law 800/1967, bearing the "New order of lyric institutions and musical activities," which declared the "relevant general interest" of

opera and concert activity "as it is intended to promote the musical, cultural and social formation of the national community."

The sample chosen, therefore, will result in 68[3] theaters, and the complete database is given in the annex.

After that, once the responses were collected, they were obviously filtered and only the complete ones have been considered, because clearly the partial ones did not allow the model to be applied and would have caused a bias in the results. The final number of responses analyzed was 25.

Finally, the model has been applied and the data have been analyzed through Opinio's tools, Excel, Power BI Desktop and the use of Minitab Statistical software.

2.4 Model computation and data analysis

The last phase of the methodology adopted for the development of the Master Thesis is related to the approach used for the development of the model and for the consequent analysis of the results obtained.

Since the model, as we will see in Chapter 3, has been made up considering all the relevant dimensions to assess the level of digitalization and to each of them has been associated one or more relevant KPI to quantitative measure the results, it is useful here to see how statistical analyses on the responses have been carried out.

Moreover, the theaters have been classified into clusters according to their characteristics, therefore it is also necessary to focus on how these clusters have been found out.

For these reasons, the following subsections are respectively devoted to the analysis of variance and the clustering process.

2.4.1 Analysis of Variance

After having assessed the digital maturity of each dimension, it has been useful to statistically perform analysis of variance to find out the existence of correlations which better explained the results obtained. The analyses, which

[3] According to DG-S, Ministero della Cultura (MiC)

results are reported in Chapter 4 have been performed through the statistical method called ANOVA[4] thus considering the interaction between a response variable and one or more factors.

Analysis of Variance is a statistical methodology which can be performed considering one or more factors[5] in order to assess how they impact a response variable which represents the output of the process analyzed. The statistical method is based on the comparison of more than two sample means of the same factor by testing two hypotheses:

- Null hypothesis (Ho): all the sample population means are equal ($\mu_1 = \mu_2 = \mu_3 = \cdots = \mu_a$);
- Alternative hypothesis (Ha): At least one μ_k is different.

In other words, ANOVA tests whether any of the population means are different. If the null hypothesis is true, all the observations can be assumed as normally distributed with mean = μ and variance = σ^2.

2.4.1.1 Hypotheses of ANOVA

In order to understand the hypotheses which need to be tested in order to assess the reliability of the statistical analysis, it is worthwhile to introduce the concept of residuals [6]. The three hypotheses to be verified to pursue an Analysis of Variance are the following:

1. Normality of residuals: Residuals need to be normally distributed with mean = μ and variance = σ^2.
2. Test for equal variance of residuals: σ^2 of all levels of the factor evaluated in the analysis have to be equal.
3. Independence of residuals: Residuals must be independent thus not autocorrelated. This hypothesis can be checked by plotting the residuals against the analyzed factor.

[4] Analysis of Variance
[5] Variables that affect the output
[6] Difference between the observed value and the mean value predicted by the model for that observation.

2.4.1.2 Interpretation of results

The results coming from the statistical analysis can be interpreted by observing statistical indexes. In particular, the main indicators adopted to assess the reliability of our analysis have been the following:

- p-Value: It represents the probability of obtaining results at least as extreme as the observed results of a statistical hypothesis test, assuming that the null hypothesis is correct. A smaller p-value means that there is stronger evidence in favor of the alternative hypothesis. In order to determine the significance of p-value, it is usually compared with a predefined alfa-level which determines the risk level taken during the analysis (the lower the better).
- R^2 and R^2-adjusted: It is used a measure of what portion of the variability in the output is explained by the examined factor. As a consequence, the higher is this value, the higher is the significance of the analysis. The R^2-adjusted takes into account the number of predictors present in the model thus being more conservative than the R^2. Indeed, unlike the R^2, the adjusted index increases only when the increase in R^2 (due to the inclusion of a new explanatory variable) is more than one would expect to see by chance.

2.4.2 Cluster Analysis

In order to classify theaters according to their digital maturity levels, it has been adopted the statistical clustering methodology. It is a multivariate method aimed at classifying a sample of objects on the basis of a set of measured variables into a number of different groups such that similar objects are placed together.

The method adopted in the analysis of Chapter 4 is called hierarchical agglomerative method as each object (theater) start in its own separate cluster for then grouping objects which are similar according to the variables analyzed. In order to determine the level of similarity and consequently clustering the objects, the adopted methodology relies on the pairwise multivariate distances. In particular, for each object, the Euclidean distance from the others is measured in order to group the closest ones in the same cluster.

However, different algorithms can be adopted to define the linkage thus the cluster of the different elements analyzed under the selected variable. Table 2.3 summarizes the abovementioned methods to define the clusters.

Hierarchical joining algorithms	*Method*
Single linkage method (Nearest neighbor)	The distance between two clusters is defines to be the distance between the two closest members, or neighbors. The main con is that it does not consider the structure of the cluster thus often resulting in a problem called chaining whereby clusters end up being long and straggly.
Complete linkage method	The distance between two clusters is defined as the maximum distance between members. Even if it tends to create compact clusters of similar size, it does not consider the cluster structure.
Average linkage method	The distance between two cluster is calculated as the average distance between all pairs of members in the two clusters.
Centroid method	The centroid (mean value for each variable) of each cluster is calculate and the distance between centroids is used to group objects. This method is very robust.

Table 2.3 - Hierarchical clustering joining algorithms

In order to have a robust analysis, it has been decided to adopt the centroid methodology to assess the distance and define the clusters of theaters.

The last step of the cluster analysis is related to the selection of the number of clusters according to the similarity level achieved. Given that an acceptable similarity level should be about 80-90, it is possible to select the number of clusters by observing the dendrogram which illustrates the different similarity levels in relation with the number of clusters selected. This method is widely used in the statistical clustering because it allows to select the number of clusters

which best fits with the analysis by taking into consideration the level of similarity.

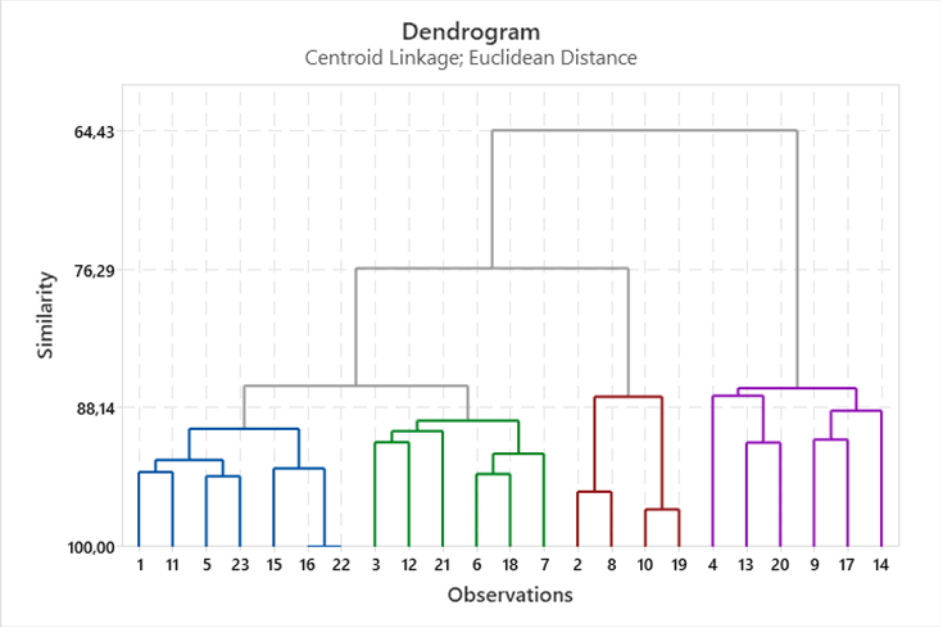


Figure 2.3 - Dendrogram from cluster analysis

Both the Analysis of Variance and the Clustering have been performed though the use of Minitab Statistics.

This chapter related to the whole methodology followed during all the process, as said in the introductory section, had the objective of explaining by degrees all the relevant steps we have taken in our research work. This, in our opinion, was necessary to clarify any doubts about the methodology we used and to better understand how we arrived at the results we will analyze in the next chapters.

3. Theater Digital Maturity Model

This chapter aims to describe how the Digital Maturity Model for theaters has been developed, deploying each dimension and how it has been conceived.

As mentioned in the literature review Chapter 1, Performance Measurement is a crucial activity for organizations in every sector, although historically it has focused primarily on financial indicators assessment. However, for cultural institutions such as theaters, whose success is closely tied to customer perception, to the quality of service provided and to the social value delivered, such traditional systems do not work properly. Moreover, since the assessment of the level of digitization is the actual object of the analysis, the existing models provided in the literature are quite inconsistent with theater organizations. Indeed, as pointed out in the literature review, the existing models focus mainly on the manufacturing sector, which is characterized by different activities and technologies in place than those used in theaters, and are therefore not adaptable and flexible for other sectors.

Consequently, the model aims to develop quantitative KPIs for assessing the digital performance of theaters, in order to fill the literature gap previously introduced and to provide a way to classify institutions according to their positioning in terms of digital maturity.

This chapter is divided in the following sections, which will deeply analyze:

- The two macro-dimensions around which the model has been developed, with related insights into the digitalization areas in which they have been deployed
- The computation methodology adopted for the assessment of the Digital Maturity level
- The classification of theaters according to their digitalization level obtained through the application of the model developed

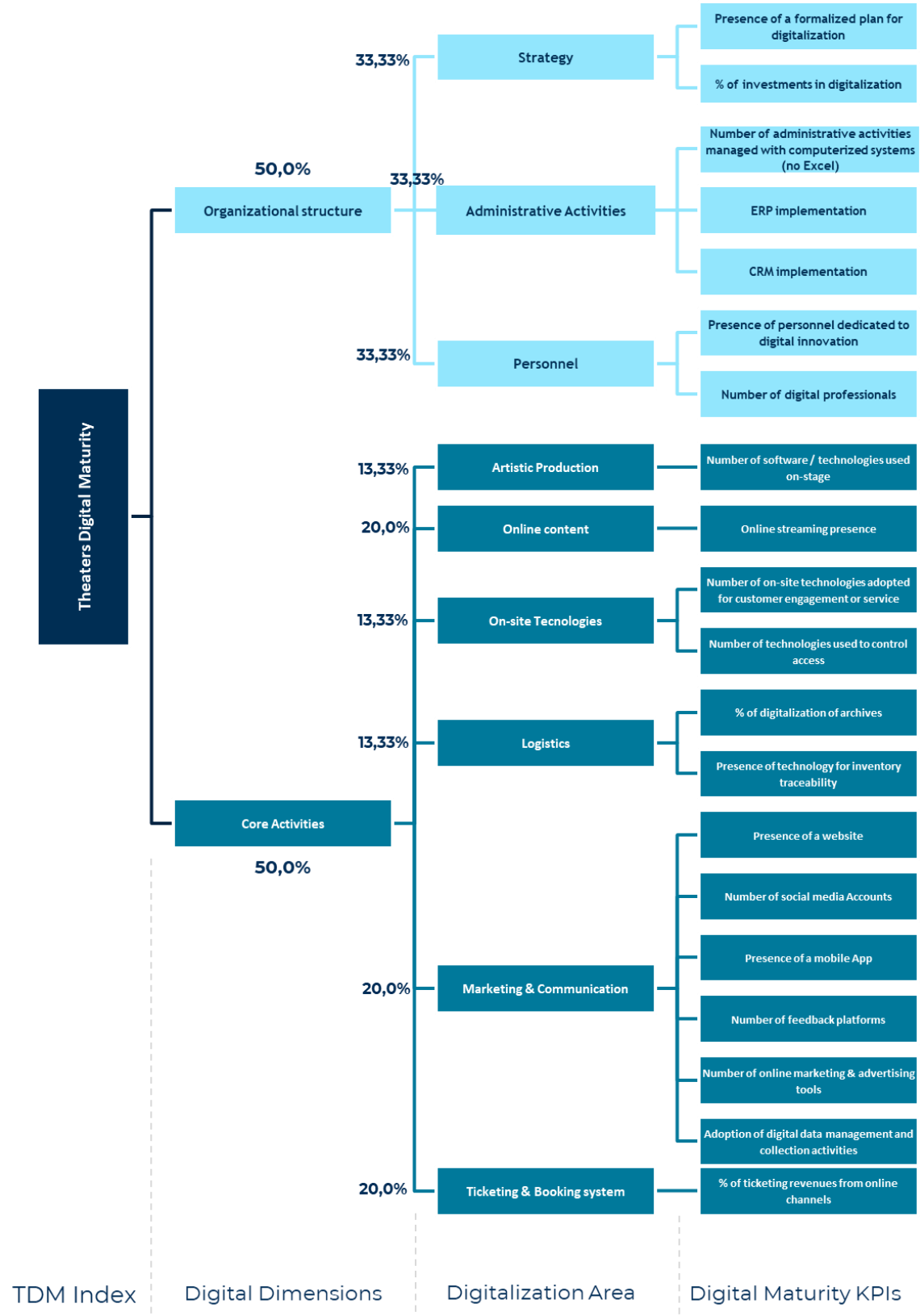


Figure 3.1 - Theater Digital Maturity Model

3.1 Model Dimensions

The model has been built around two main dimensions: the organizational structure and the core activities. These sections encapsulate all the main activities that need to be taken into account in order to assess the impact of digitization on theaters. In turn, these two main macro areas have been further investigated and a number of more punctual sub-dimensions were identified. Subsequently, it has been possible to define the digital KPIs used for the quantitative assessment.

3.1.1 Organizational Structure

The organizational structure outlines how certain activities are directed in order to achieve the organization's goals. Such dimension includes both activities, roles and responsibilities and it is closely related to the organization's mission and vision. Mintzberg (1972) defined organizational structure as the framework of relationships among jobs, systems, operational processes, people and groups that are committed to achieving goals. Consequently, as pointed out by Hold and Antony (1991), the structure influences all the organizational processes.

Based on these considerations, for the development of the model, organizational structure has been considered as a key pillar. Then, it has been developed around the concept of digitization, through the identification of three main areas:

- Strategy, which outlines the plan of action to achieve the organization's vision and set goals and guides decision-making processes to improve the company's financial stability in a competitive market
- Personnel, which represents the skills and competencies available within the organization
- Administrative activities, which refers to the administrative aspect of the institution and its management.

3.1.1.1 Strategy

Business strategy is the deliberate pursuit of an action plan that develops a company's competitive advantage (Peter Drucker). According to Mintzberg, then, it is a pattern in a stream of decisions.

All these definitions could be summarized by the way the organization conceives its value proposition and its organization to achieve its goals and gain competitive advantage in the market. Accordingly, Michael Porter's concept of strategy is related to the delivery of a unique mix of value. This is especially important for theater companies, as their offerings are perceived directly by the customer, thus determining their success.

To this extent, in order to keep the pace of the digitization trend and consequently to remain competitive in the market, part of the strategy of many structured organizations is totally dedicated to the digitization plan both in the present and for future development, thus impacting all other areas and activities. Accordingly, the concept of organizational strategy related to digitization allows to identify three main categories:

- Business strategy
- IT strategy
- Digital strategy

Although these areas are related and aim at common goals (increased performance in terms of value creation and capture), they have different meanings.

Business strategy, as already seen, is an integrated, comprehensive, long-term plan that comprises a coherent set of strategic decisions and is aimed at creating and sustaining competitive advantage in a business area.

For what concern, instead, IT Strategy and Digital Strategy, although they are often used synonymously, they are increasingly diverging in the meaning associated with them and the approach they evoke and advocate for. Today everyone thinks to have a digital strategy but while a company may have a business or IT strategy that incorporates digital technology, an IT strategy is not the same as a digital strategy (McDonald, 2012).

IT strategy is related to the use of information technology adopted by organizations as tools to boost productivity or lower operational costs. According to the overall strategic vision, IT strategy must be aligned with the company's business strategy. "IT strategy is a technical answer to a business question, 'How will IT help the company win?' It assumes that the business strategy has been defined, then considers how to use IT to make that strategy successful. IT strategy is usually conducted downstream of/after business strategy" (Aron, 2013). Digital

technologies, on the other hand, can be seen as a combination of information, computing (hardware and software), communication and connectivity technologies that are fundamentally reshaping traditional business strategy through modular, distributed, cross-functional and global business processes that enable work to be done across boundaries of time, distance and function (Bharadwaj, Sawy, Pavlou, & Venkatraman, 2013).

Digital strategy, therefore, can no longer be confined to the IT function (as was the case with IT strategy), but must be formulated in conjunction with business strategy as it impacts all its key steps. As a result, rather than Digital Strategy, we should refer to "Digital Business Strategy," that is, a Business Strategy that is inherently Digital in nature, purpose and scope.

Digital Business strategy definitions
"Digital business strategy is a business answer to a digital question: "how should our business evolve to survive and thrive in an increasingly digital world?" It is not a separate strategy, but instead a lens on business strategy. All aspects of the business strategy should be informed by digital considerations" (Aron, 2013).
"Digital business strategy is a pattern of deliberate competitive actions undertaken by a firm as it competes by offering digitally enabled products or services" (Woodard et al., 2013).
"Digital business strategy is more than it strategy since it is the extent to which a firm engages in any category of it activity to create value" (Mithas et al., 2013).
"DBS is an organizational strategy formulated and executed by leveraging digital resources to create differential value" (Bharadwaj et al., 2013).
"Digital is the application of information and technology to raise human performance. Human performance is the essence of digital transformation. Human performance creates the type of value that leads to revenue. Alternative goals for digital create efficiencies that largely drive down the cost of creating short-term benefits but drain the economy and growth" (McDonald, 2012).

Table 3.1 - Digital Business Strategy definitions

Thus, to summarize the different concepts of IT and digital business strategy we can emphasize that:

- A digital strategy is a revamping of IT in a world with a new context, new tools, new management and consumer awareness, and an increased digital density
- Digital strategy is what IT strategy should have been if virtuously applied
- Alignment is not enough: business strategy and digital strategy are and will be critical to the co-creation and co-formulation of digital strategic renewal, formulated around an original combination of digital assets and capabilities as new sources of competitive advantage.

3.1.1.2 Administrative Activities

The second sub dimension of the organizational structure is represented by administrative activities. Business administration is aimed at monitoring and managing every aspect of the business to ensure the enterprise has its best chance of succeeding. Shortly, the business administration process is the supervision and control of a business. This includes all the back-office activities necessary both to monitor activities and to relate business strategy with all the activities that serve as guidelines.

Several experts have classified the functions of Business Administration. Luther Gullick introduced the keyword "POSDCORB" to summarize the main administrative activities as follows:

- Planning, which basically consists in deciding in advance and determining the course of action to achieve the desired goals
- Organization, which consists of providing the company with everything that is useful for its operation
- Staffing, which concerns the selection and development of personnel to fill all roles within the organization
- Directing, which concerns communication activities between different levels and supervision
- Coordination
- Reporting and Budgeting

In recent years, many of these activities have been integrated with new technologies in order to save time and resources through greater efficiency while

being more effective. However, many organizations still rely on manual activities or basic Excel spreadsheets to manage these back-office activities. Among the most relevant administrative tasks for theatrical organizations whose management could be digitized, there are:

- Accountability
- HR management
- Didactic activities management
- Reporting
- Supply Chain Management
- Logistic Management
- Fundraising
- Artistic programming.

In addition, as mentioned in the Literature review Chapter 1, some structured companies adopt digital systems such as ERP and CRM, in order to facilitate the management of these activities, although their implementation requires rather high investments and special skills.

3.1.1.3 Personnel

The third pillar considered by our model in defining the structural configuration of the organization, is represented by the human resources, which determine the availability of skills and know-how within the organization.

This pillar becomes extremely important when considering an institution's level of digitization, as it can make a difference to both internal operations and what is delivered to the market, which directly affects customer perception. Knowing that digital technologies play a role in all aspects of the operation, control and coordination of organizations' activities (Setia, Venkatesh, & Joglekar, 2013), their effectiveness directly depends on the presence of digital know-how.

Regarding theaters, based on the literature review, the model was based on the identification of some major roles:

- Digital Manager: This figure can have different responsibilities ranging from marketing to processes, depending on the level of digitization of the organization in which he is employed. He is responsible for defining and driving digital strategy and digital growth, through a high level of both management and hi-tech skills

- Social Media Manager: This figure oversees interaction with audiences through the implementation of content strategies on social media platforms. His tasks include analyzing engagement data, identifying trends in customer interactions, and planning digital campaigns to build online community. He manages social media with activities including news dissemination, creating and managing editorial plans, communicating and promoting the brand, products, services and events, and creating and sharing web content (European Informatics Passport)
- User Experience Developer/Designer: This figure has the skills to learn the journey a user takes when they are on the front-end of a website or digital content and then design the best possible path for the user. Their goal is to ensure that the user has a pleasant and easy digital journey
- Data Protection Officer: This figure is an employee or external party responsible for a company's data protection strategy and compliance with the General Data Protection Regulation (GDPR)
- Light Designer: A theatrical light designer works with the director, choreographer, set designer, and costume designer to create the lighting atmosphere taking into account all issues of visibility, safety, and cost
- Digital archivist: This is a crucial role in theaters that manage archives in a digitized manner. It requires advanced technological skills to manage archives through software and databases and make them available to the institution and external stakeholders.

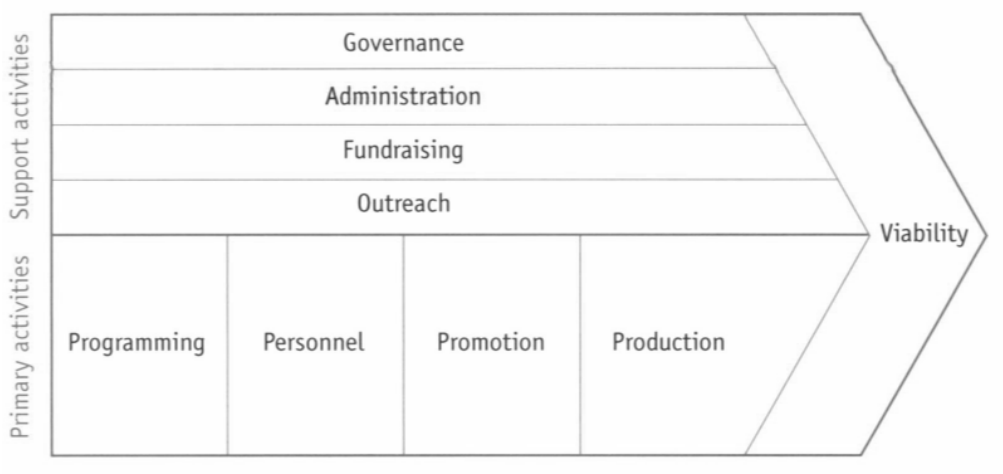
3.1.2 Core Activities

After having identified the macro-dimension related to the structure of the organization, the literature review allowed to identify the second macro dimension of the model: the core activities. This category includes all the peculiar activities for the institution which can be digitalized.

Specifically, it is possible to introduce the following sections by classifying these activities as follow:

- Logistic Management
- Artistic Production
- Marketing and Communication
- Ticketing and booking

- On-site interaction and engagement
- Online content available for spectators.



Performing Arts Porter's value chain (Preece S. , 2005)

As a reference framework, we can consider Porter's value chain adapted to performing arts organizations, where activities are classified into two main categories:

- Primary activities: These activities, in Porter's traditional value chain, represent everything directly involved in the creation and distribution of goods and services. They are, therefore, linked to the institution's core activities.
- Support Activities: These activities, on the other hand, support primary activities and are not directly involved with the core business.

As the supporting activities such as governance and the administrative part have been already covered by the organizational structural dimension of the model, the second macro-area has been directly related to the typical aspects characterizing a theater, which, in Porter's Value Chain are included in the primary activities section. However, it is important to point out that the administrative and competences area, along with strategy, have not been considered of less importance with respect to these core activities. They have been classified in the two separate dimensions in order to highlight and better clarify the peculiar activities of a theater.

Consequently, such primary activities of the Porter's value chain have been adapted to the theatrical context in order to understand, from a literature point of view, the main practices within a theatrical institution with the purpose of

measuring the digital maturity level in the different areas. Accordingly, we can distinguish:

- Logistics: It represents all the internal activities for the management of archives and warehouses, as well as the handling of instruments and costumes needed for staging
- Marketing & Sales: It represents all activities related to customer interaction and the advertising of the institution and the theater season. Moreover, it also includes all tasks related to how the theater sells tickets and services to the final customers
- Production: In the performing arts context, the Porter's operations coincide with the artistic production activities, which basically refer to the construction and staging of the show
- Services: It includes activities to enhance customer experience both on-site and online

Since the goal of the model is to identify, among the multiplicity of activities performed within theaters, which ones could be digitized and consequently assess the level of integration with digital technologies, they were further broken down into several sub-dimensions based on the main target area of digital technologies.

3.1.2.1 Logistics

Regarding logistical activities within the theater, as already seen from the literature review, one of the main operations that enables the application of digital technologies is related to the management of the archives. This is of particular importance for all cultural institutions whose goals include the preservation of cultural heritage. Consequently, in recent years many structured theaters have increased the level of digitization of their archives to facilitate their management and their accessibility. The main difference is defined by the level of digitization applied to the archives, which can affect the entire archive or only a part of it. It also affects the accessibility of the contents, which may be usable only internally for their management, or even externally for study and research purposes. As a result, some theaters limit external accessibility to experts or researchers, while others make archives, or at least part of them, available for consultation to anyone.

Another important issue related to logistics activities concerns the traceability of materials within the organization, which could be enhanced by various technologies, from RFID to the more advanced adoption of Blockchain.

3.1.2.2 Marketing & Communication

Marketing and communication is one of the primary activities for any type of organization in any industry in order to promote offerings and to keep in touch with end customers. Marketing strategies of theaters in recent years have been enhanced by many digital tools that allow them to interact with customers and advertise the season more effectively. The most widely used tools that are becoming a must for all theaters are websites and social media. These online platforms also allow the organizations to advertise their services through remarketing, SEO (search engine optimization) or other tools offered directly by social media.

Another crucial role in the theaters dealing with many segments of viewers and visitors, is the collection and the management of data. This activity is closely related to three main factors:

- Which type of data are collected: indeed, they can vary from customer's personal information to customer satisfaction or more structured feedback
- How data are collected and analyzed: indeed, they may be collected digitally and dynamically or statically
- How the data collected and analyzed are used by the organization: indeed, some companies use data only to obtain information about their customers, others instead directly to define marketing strategy and offers

3.1.2.3 Ticketing & Booking

Booking and ticketing, which in Porter's value chain is identified with "Sales" and is usually considered as part of marketing, is an extremely important activity for theaters. In particular, the ticketing and reservation systems they have are essential. Every theater can make use of various physical and online channels to sell its tickets and an effective management facilitates audience purchase and certainly increases attendance. Obviously, to have effective systems in place, theaters need to understand the purchasing behaviors of their audiences and define their sales strategy accordingly, and in this field, the most recent technologies can offer considerable help.

3.1.2.4 Artistic Production

As already explained in the literature review Section 1.1.3 dedicated to the digitalization in theaters, the artistic production is currently influenced and enhanced by the presence of many digital technologies which directly affect the value proposition of the theater. These technologies are very wide and can make more effective each part of the production activities, from the development of scenography through 3D Print to their management thanks to software able to remotely control sounds, lights and other effects.

3.1.2.5 Customer Experience

According to the model developed by Westerman (2014), one of the main areas of application of digital technologies within an organization is related to improving the customer experience, in order to increase customer engagement and loyalty and eventually build personalized offers. In theaters, this can be enhanced with both online and onsite technologies and experiences.

On-site digital technologies make it possible to increase the level of customer engagement through a variety of technologies. Classic must-haves, such as Wi-Fi, interactive totems, and touchscreens can be adopted for this purpose, all the way to more advanced and expensive technologies such as VR and AR.

The same is true for the online experience, which through the continuous evolution of digital tools allows for an increasingly attentive, engaging, and personalized service to customers.

Moreover, as already introduced in the literature review Section 1.1.3, many theaters have developed video games, mobile applications, and online streaming to increase the level of customer satisfaction and the service offered. To this extent, the Covid-19 pandemic has increased the awareness about the importance of such remote tools to provide a value proposition to spectators even when the theater is closed.

3.2 Digital KPIs

The following sections of the chapter are aimed at describing, for each of the two dimensions of the model, the Key Performance Indicators adopted to assess the level of digitalization in all the relevant subdimensions identified and described above.

The framework adopted in order to differentiate the KPIs, identifying for each category both a minimum and an improving level, is the Kano Model represented in Figure 3.2.

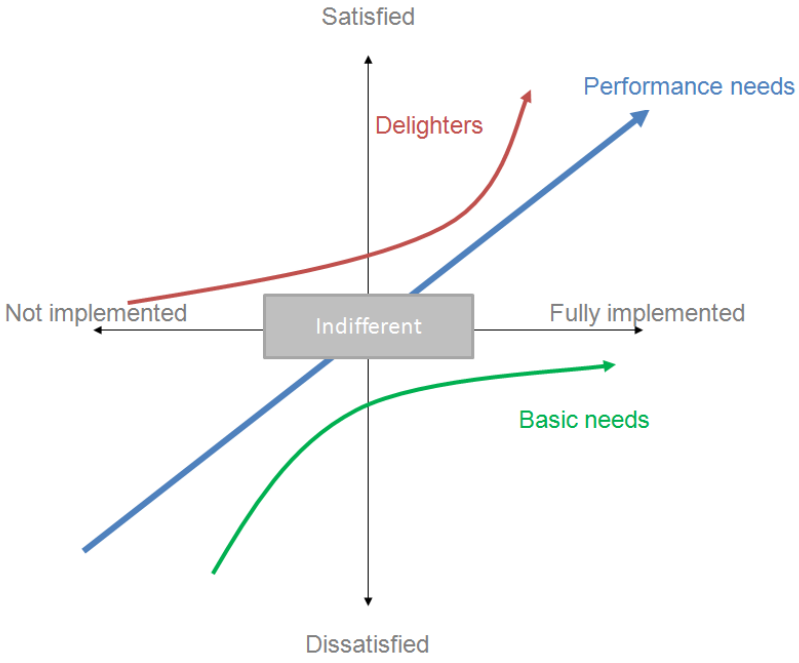


Figure 3.2 - Kano Model

Being the purpose of the research related to the assessment of the Digital Maturity of theaters, the model developed by Professor Noriaki Kano in 1980s is particularly suitable. Indeed, this framework is widely adopted both to assess the quality of a product or service related to the customer satisfaction and the level of innovation related to the current needs of the market. In particular, the model allows to differentiate attributes of a product or service, which in our case will be related to the technologies and digital services offered by the theaters into two main categories as follow:

- Basic needs or Must-have: These attributes are all the features taken for granted by the market. Accordingly, when such services or attributes are

present, the minimum criteria are respected, while if they are absent, it represents a problem in terms of market satisfaction in case it regards a technology offered to the customers and in terms of competition positioning in case it regards the organizational structure.

- Delighters or Nice to have: These attributes represent the improvement criteria as the institutions which include them in their service or organization can achieve a competitive advantage which, in the case of digitalization, can be represented both by a better service offered to the spectators and visitors or by the improvement and simplification of internal processes.

3.2.1 Organizational Structure KPIs

As already explained in the Section 3.1.1 dedicated to organizational structure, the areas addressed to estimate the level of digitalization of theaters are:

- Strategy: in this case, the level of digitalization has been estimated by assessing the presence of a plan dedicated to digitalization and the portion of financial investments dedicated to digital technologies and services.
- Administrative activities: in this case, it has been selected as driver of digitalization the adoption of managerial digitalized system such as ERP and CRM as well as the assessment of the number of administrative activities managed through informatics systems more advanced than a basic Excel sheet. The activities that here are taken into consideration for evaluating the usage of informatic systems are: accountability, HR management, didactic activities management, reporting, supply chain management, facilities management (such as for renting spaces), fundraising and financing management, artistic programming.
- Personnel: this has been evaluated considering as KPIs both the presence of internal competences dedicated to digital innovation and the number of digital operators present within the organization or hired externally. In particular, the digital experts considered in the assessment are digital manager, social media manager, user experience developer/designer, data protection officer, light designer, digital archivist.

At this point, we can see, summarized in Table 3.1, all the KPIs adopted for each sub-dimension. They have been differentiated between basic requirements, representing the minimum criteria and delighters, representing the improvement

criteria evaluated from the benchmarking with the actual situation thanks to the administration of the survey.

Digitalization Area	Digital KPI	Basic Needs (Must have)	Delighters
Strategy	% of investments in digitalization	% of investments between 1% and 10%	% of investments higher than 10%
	Presence of a formalized plan for digitalization	Presence of a digitalization plan within another document	Presence of a dedicated document for digitalization
Administrative Activities	ERP implementation	Plan for future implementation	Implemented ERP
	CRM implementation	Plan for future implementation	Implemented CRM
	Number of administrative activities managed through informatic systems (different from Excel)	At least one administrative activity managed though informatic systems	Digital management of all the administrative activities proposed
Personnel	Presence of personnel dedicated to digital innovation	Existence of internal competences even if not fully dedicated	Existence of an internal team dedicated to digitalization
	Number of digital competences/experts available	Presence of at least one digital expert	Presence either internally or externally of the digital professional proposed

Table 3.2 - Organizational Structure KPIs

3.2.2 Core Activities KPIs

This dimension summarizes all the main activities of a theater in which digitalization can be integrated primarily in order to provide a differentiated service to the customers both online and on-site, to facilitate some activities and

to enhance better internal performances. Also in this case, Key Performance Indicators have been developed addressing the sub-dimensions highlighted below:

- Logistics: the level of digitalization of logistic activities has been evaluated through the assessment of the portion of archives which is available in a digital form and the presence of technologies, such as RFID, to facilitate the warehouse management.
- Artistic production: this activity can be facilitated and improved through the use of software for managing the stage activities or technologies to provide better and new performances to the spectators. Accordingly, the questionnaire has assessed the usage of software or technologies for the following activities: machinery handling, digital scenery, sound system control, lighting system control.
- Marketing and Communication: the level of digital maturity of theaters related to this primary activity has been computed to the evaluation of the presence of digital and online instruments such as websites, mobile app, online marketing tools, social networks and feedback platforms as well as the availability within the organization of data management processes.
- Ticketing and Booking systems: digitalization has been measured through the evaluation of the presence of digital channels for purchasing or booking tickets and the consequent percentage of sales coming from such channels.
- On-site core activities: they are related to the interaction with customers. In this case, KPIs are devoted to the assessment of the number of technologies available to the spectators or visitors. The on-site technologies and digital services assessed through the questionnaire are Wi-Fii, audio guide, interactive totems, QR code, LIS videos, AR, VR, MR, touchscreens, beacon, displays, NFC.

  Moreover, according to the analysis of the literature, another useful indicator of digitalization level has been identified in the presence of technological systems to check and trace accesses to the structure. This KPI has acquired particular importance after the Covid-19 pandemic which made this activity mandatory for a long period.

- Online engagement of spectators: this can be measured though the availability of online streaming. This activity became a must have during the periods of lockdown caused by the pandemic.

Digitalization Area	Digital KPI	Basic Needs (Must-Have)	Delighters
Logistic	% of digitalization of archives	% of digitalization between 1% and 25 %	% of digitalization higher than 25%
	Presence of technologies for warehouse management	Plan for future implementation	RFID implemented
Artistic production	Number of on-stage software / technologies adopted	Presence of at least one software or technology on stage	Presence of all the software proposed for artistic production (4)
Marketing & Communication	Number of online marketing tools	Presence of at least one advertising tool	Presence of all the online marketing tools proposed (4)
	Presence of a website	Presence of a website in common with other institutions or within other websites	Presence of a website dedicated to the theater
	Number of social media	Presence of at least one social media account	Presence of 6 or more social media accounts
	Number of feedback platforms	Presence of at least one feedback platform	Presence in 3 or more feedback platforms
	Presence of digitalized data management activities	Data collected digitally	Dynamic data collection and use of data for 3 or more purposes proposed
	Presence of a mobile app	Plan for future implementation	Presence of a mobile app

Ticketing and Booking	% of sales coming from online ticketing channels	% of sales between 1 and 10 %	% of sales higher than 10 %
On-site	Number of on-site technologies provided to spectators / visitors	Presence of at least one of the investigated technologies	Presence of 4 or more of the investigated technologies
	Number of digital systems to control accesses	Presence of at least one digital system to control entrants	Presence of 3 or more t digital systems to control entrants
Online Engagement	Presence of online streaming shows	Presence of online streaming during the pandemic	Presence of online streaming also after the pandemic

Table 3.3 - Core Activities KPIs

3.2.3 KPIs Computation

In order to quantitatively estimate the values of the Key Performance Indicators of digitalization, we have adopted an approach similar to the one adopted for the computation of the DESI (Digital Economy and Society Index) 2021, developed by the European Commission to monitor digital performances and track the progress over time.

Indeed, after having identified the digital indicators explained in the previous sections, it has been necessary to estimate their values from the questionnaire administered to the sample. In particular, each section of the survey was dedicated to a specific dimension of the model to be measured. Then, taking into account the differentiation between must-have and delighter, it has been attributed a score to each response by normalizing the values. The normalization is a necessary step, in particular for indicators evaluated on the "number of" in order to obtain comparable measurements among the different indicators.

In order to concretely explain the methodology usage for calculation, it is necessary to differentiate according to the typology of indicator considered as follow:

- % KPIs ("% of"): the score has been computed considering the percentage expressed by the respondent in the questionnaire. Since questions were

structured by percentage ranges, it has been taken as value of the indicator the upper limit as in the example below.

- Numeric KPI ("number of"): the final result has been computed following the normalizing approach represented by the following equation

$$KPI_{value} = \frac{Number\ of\ selected\ options}{KPI\ delighter\ value} \times 100$$

- "Presence of" KPIs have been expressed as a Boolean variable adapted to a scale of 100 and adjusted considering the minimum and delighters criteria (Table 3.2 and 3.3)

Once obtained the values of the different indicators, it is possible to quantitatively assess the values of each digitalization area and dimension of the model in order to get the final score of the TDM.

In particular, the weights of the different indicators and of the different dimensions of the model have been developed with to the support of the General Director of DG-S (Direzione Generale dello Spettacolo) of Ministero Italiano dei Beni Culturali. Specifically, from the interview conducted, it turned out that within the core activity dimension, the most relevant areas of digitization relate to marketing and communication, online content and online ticketing. This greater importance is due to the fact that these attributes are more recognizable both by customers to increase their degree of satisfaction and interaction but also by private investors who prefer to invest in theaters with greater visibility and online presence. Thus, in order to respect such trend, the 60% of the core activities dimension have been dedicated to the three abovementioned digitalization area, i.e., Online Content, Ticketing, Marketing & Communication, while splitting the remaining 40 % among the others.

For what concerns, instead, the weighting process of KPIs and the other dimensions, since no other particular differences turned out from the interview, weights have been distributed homogenously.

Accordingly, the following formulas summarizes the computation of the two dimensions of the model and the Theaters' Digital Maturity (TDM):

$$\boldsymbol{Organizational\ Structure_{index}} = 33{,}33\% \times Strategy_{index} + 33{,}33\% \times Administration_{index} + 33{,}33\% \times Personnel_{index}$$

$$\boldsymbol{Characteristic\ Activities_{index}} = 13{,}33\% \times Artisitc\ Production_{index} + 20\% \times Online\ Content_{index} + 13{,}33\% \times Onsite\ Technologies_{index} + 13{,}33\% \times Logistic_{index} + 20\% \times Marketing\ \&\ Communication_{index} + 20\% \times Ticketing_{index}$$

$$\boldsymbol{Thetaer\ Digital\ Maturity\ (TDM)} = 50\% \times Organizational\ Structure_{index} + 50\% \times Characteristic\ Activities_{index}$$

3.3 Classification

After that, a further step in our Master Thesis was made in order to classify and clusters the theaters studied with the model. Theaters have been ranked according to their score, which determine their positioning in relation to the other components of the sample.

Since the model is built on two main dimensions, the presence of two axes represented by structural organization and core activities, respectively, made it possible to identify a matrix characterized by 4 quadrants. Each of these quadrants is obviously defined by a different level of digitization, given by the intersection of the two macro areas.

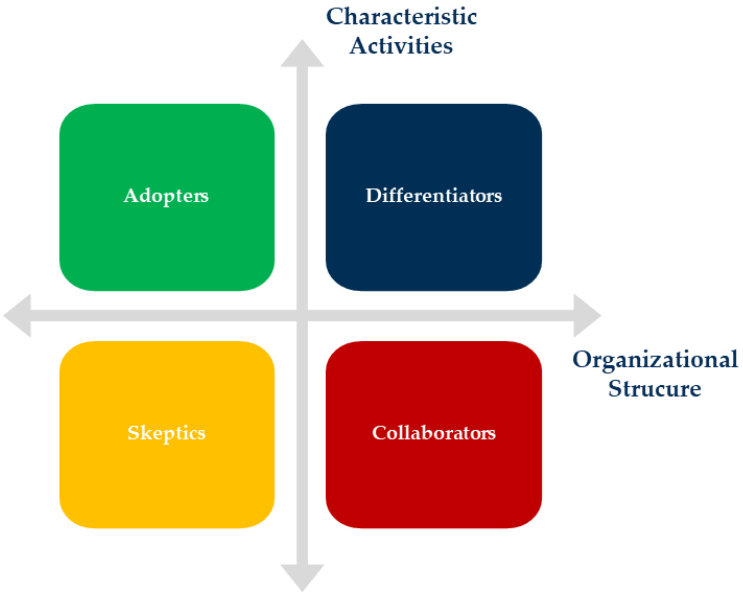


Figure 3.3 - Theaters' classification. Source: Adapted from (Gill & VanBoskirk, 2016)

The classification proposed by Gill and VanBoskirk in Digital Maturity Model 4.0, in which theaters have been classified into 4 main clusters based on their digital maturity, has been reported as a reference. In Figure 3.3 it is possible to see that the vertical axis represents the level of digitization of the theaters' organizational structure while the horizontal axis represents their digital level based on the core activities.

Accordingly, the proposed taxonomy has allowed to identify:

- Differentiators, which are characterized by a mature digital business that integrates marketing, customer experience and insights teams to create a customer-centric experience (Gill & VanBoskirk, 2016). As a result, these institutions have a high level of digitization both in terms of organizational structure and approach to digital business strategy that allows them to integrate digitization into other activities at a high level of implementation.
- Collaborators, who are characterized by a high level of investment in digitization, then have a well-structured digital plan and strategy in place, but their level of implementation in the main activities and for enhancing a better customer experience is lower compared with differentiators.
- Adopters, who are in the opposite position compared to collaborators. Their level of implementation of digital technologies both online and onstage allows them to have a good score in the activities' dimensions, but they lack a guideline such as a plan or strategy dedicated to digitization.
- Skeptics, who do not believe that digital disruption is important to them and therefore designate digital development usually as a low priority (Gill & VanBoskirk, 2016) and are thus characterized by a low level of digital maturity in both macro dimensions of the model.

4. Results Analysis and Model Computation

The following sections are aimed to apply the model presented in the previous chapter, in order to assess the level of digitization in Italian theaters.

In the first part of the chapter the responses collected through the survey will be analyzed in order to have a complete picture of the sample situation and allow the computation of the digital KPIs.

Subsequently, all the dimensions of the model will be considered in order to perform statistical analysis and classify theaters into clusters according to their Digital Maturity level.

4.1 Survey Results Analysis

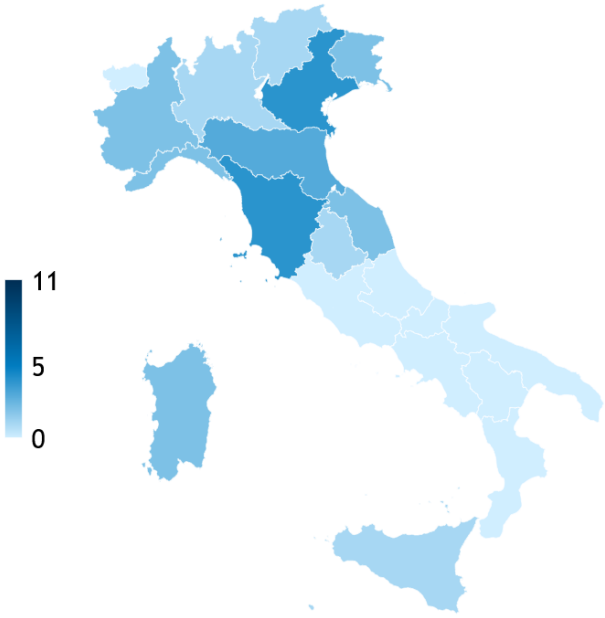
As already explained in the Methodology chapter, the questionnaire has been administered to the population identified for the research even if some of the responses received were not completed and, in order to apply the model in all the dimensions, they have not been included.

Before the evaluation of the responses and their graphical representation, it is worthwhile to analyze the geographical distribution of the responding theaters and the number of respondents for each FUS category examined. In this way, it will be possible to assess the significance of the sample compared with the total population related to the four categories analyzed.

In order to understand the geographical distribution of the statistical sample i.e., completed responses, it is necessary to point out how Italian regions have been divided into three main geographical areas:

- North: Emilia Romagna, Friuli Venezia Giulia, Liguria, Lombardia, Piemonte, Trentino Alto Adige, Valle D'Aosta, Veneto.
- Centre: Lazio, Marche, Toscana, Umbria.

- South: Abruzzo, Basilicata, Campania, Molise, Puglia, Sardegna, Sicilia, Calabria.



Area	Population	Sample
North	53 %	60 %
Centre	21 %	28 %
South	26 %	12 %

Table 4.1 - Comparison between sample and population geographical distribution

Figure 4.1 - Geographical distribution of the sample

As represented in the map and table above, the geographical distribution of the sample is characterized by a higher number of theaters in the North Italian regions which constitute the 60% of the total sample, being significantly representative of the population which is characterized by a higher portion of theaters in the Northern regions. Indeed, 36 out of 68 theaters belonging to the 4 main FUS categories described in the Methodology chapter, are distributed in the North of Italy constituting about the 53% of the whole population. For what concerns the other two areas, the map highlights that only the 12% of the sample is represented by theaters located in the South of Italy, that is due to a lower rate of response of institutions situated in these regions. Contemporarily, the rate of response has been higher in the central Italian regions, where the greatest number of theaters of the sample is located in Tuscany being perfectly aligned with the population.

After analyzing the reliability of the sample with regard to its geographic distribution, in order to obtain a complete comparison and proceed to an accurate statistical analysis, it is useful to analyze the representation of the sample for each of the 4 categories defined by the FUS distribution by the Italian Culture Ministry.

Category	Number of responses	% of the population
Lyric - Symphonic Foundations	7	50 %
National Theaters	5	71 %
Theaters of Significant Cultural Interest	6	33 %
Traditional Theaters	7	24 %
Total sample	**25**	**37 %**

Table 4.2 - Sample composition by FUS category

As represented by the table above, with 25 theaters out of 68, the statistical sample represents 37 percent of the population. In detail, the highest representation is in National Theaters, having received complete responses from 5 out of 7 theaters meaning the 71% of the population.

As for the Lyric and Symphonic Foundations, the sample contains exactly half of the theaters in that category.

Finally, for Theaters of Significant Cultural Interest and Traditional Theaters, the quantitative representation is lower with 33 percent of theaters for TRICs and 24% for Traditional Theaters, respectively.

Basically, looking at the results described above, although the target population to which the survey was administered was not completely covered, the final sample obtained significantly represents all categories both quantitatively and considering the geographic distribution. Therefore, it was possible to continue the statistical analysis on the sample just described.

In order to introduce the analysis of the results, it is also worth noting the heterogeneity of the sample respectively to the economic size of the constituent theaters (measured by revenue in the last three years), being a factor possibly related to the level of digitization and the rate of investment of an institution. Accordingly, the bar chart of figure 4.2 shows how financial revenues from ticketing are distributed from 2019 to 2021.

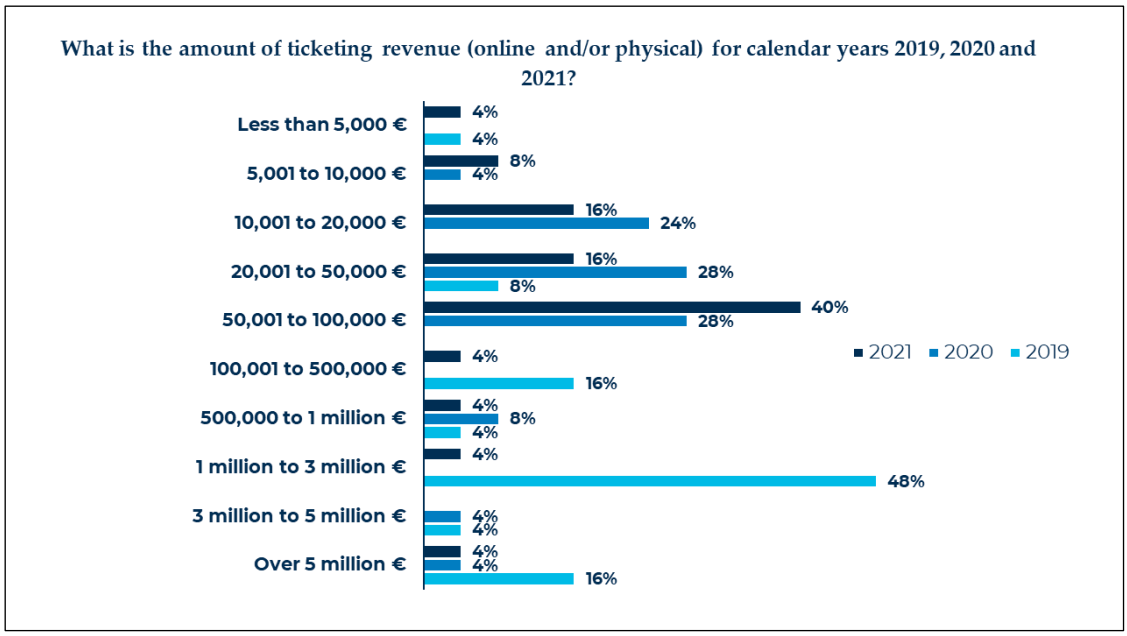


Figure 4.2 - Ticketing revenues for the years 2019, 2020 and 2021

As can be seen, the sample is very heterogeneous, presenting at the same time theaters with a revenue level above 1 million € and theaters with lower financial levels. Such heterogeneity will be very useful for the development of the model as it will allow to test its validity on institutions of different size and investment capacity that are expected to have different levels of digitization as a direct consequence.

By preliminarily analyzing the sample revenue, it was also possible to observe the impact that the Covid-19 pandemic had on the theater sector. Specifically, the sample had an average reduction in revenues of 57 percent from 2019 to 2020, confirming that the pandemic had a strong negative effect on theater institutions. However, some theaters were still able to maintain high levels of revenue in part due to paid digital services, such as online streaming, offered to their audiences.

In 2021, there was a slight recovery in the sector although levels still remained very low when compared to 2019 figures, due to the persistence of restrictions on the capacity of theater spaces and on their opening in certain time periods. This trend of recovery is fortunately continuing during the current year thanks to the reduction of the pressure of the pandemic.

However, as already pointed out in the Literature Review chapter, Covid-19 has highlighted the importance of digitalization in cultural institutions as theaters and, although it has represented an enormous threat for the sector, it has brought important opportunities increasing at the same time the awareness about the

technologies and digitalization importance in order to be more resilient to such difficult situations.

The model developed in the Master thesis is also aimed at underlying the impact of the pandemic on the digitalization level of theaters assessing both if they have adapted new technologies as a consequence of the Covid-19 or if they were already mature for facing in the best way possible this disruptive event. The following sections of the chapter are aimed at analyzing the results obtained for each area of interest assessed with the administration of the survey.

4.1.1 Organizational Structure

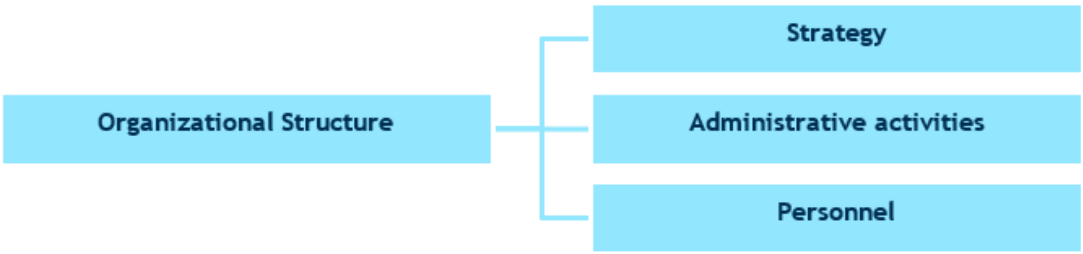


Figure 4.3 - Digitalization area, Organizational Structure dimension

4.1.1.1 Strategy

As already mentioned in the section 3.2.1, the strategic area of the organizational structure, has been quantified through two KPIs represented below in figure 4.5.

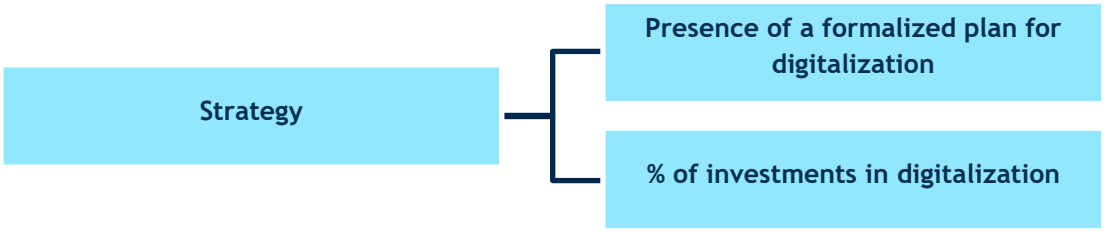


Figure 4.4 - Strategy KPIs

The following sections describe the results obtained from the administration of the survey to the sample and the consequent computation of the digital indicators just mentioned: the presence of a formalized strategic plan for digital innovation and the percentage of investment dedicated to digital innovation out of the total amount of annual investment.

Digital Plan

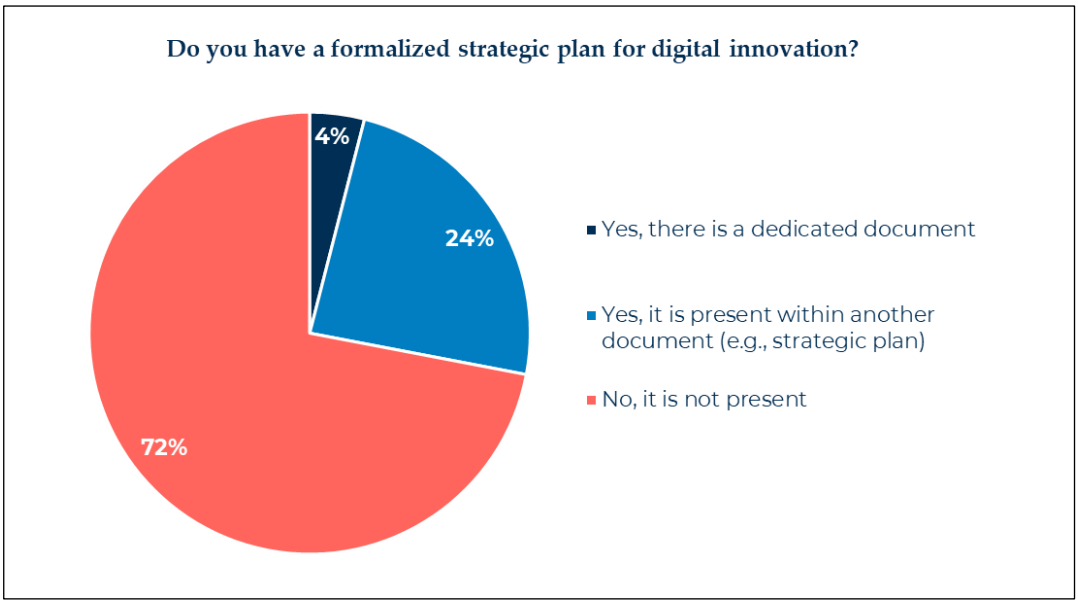


Figure 4.5 - Presence of a formalized plan for digitalization

With reference to the strategic plan for digitalization, 28 percent of theaters have a document for planning digital innovation, but only 4 percent have a dedicated document, while the remaining 24 % have it within another document (such as within the strategic plan). Interestingly, then, 14 percent of the theaters that responded to have a digital plan, developed it as a requirement for receiving funding.

This underscores how the presence of a plan dedicated to digital innovation is still not a widely spread aspect in theaters and the perception of digitization is not yet seen as a necessary and fundamental element to be included in the theater's actual strategy.

It is certainly true, however, that the pandemic has been a major impetus toward the new direction of including digitization in theater strategy and has given a push toward redefining the meaning and importance of digitization. In fact, when asked "Have you revised the digital plan in light of the new opportunities and needs that have emerged as a result of the pandemic?" 43 percent responded “yes”, while the remaining part answered "not yet, but we plan to." This highlights in a very interesting way how all theaters have now acquired the perception that they can no longer remain indifferent to the growing importance of digitization. Indeed, digital development is increasingly becoming a necessary feature not only to remain competitive, but also to survive.

Accordingly, following the computational method explained in Chapter 3, it has been possible to quantify the digital plan indicator scores as represented in the table below.

Category	Avg KPI value
Lyric - Symphonic Foundations	21,4
National Theaters	20,0
Theaters of Significant Cultural Interest	25,0
Traditional Theaters	21,4
Total Sample	**22,0**

Table 4.3 - Digital plan presence, KPI values

By observing the values and considering that they have been computed on a scale of 100 which thus represents the maximum achievable result, it is possible to conclude that the results of such KPI are very low. This confirms that most of the theaters, independently from the category of belonging, still do not have a formalized plan dedicated to digitalization and, among the others, only few of them have obtained the full score having a dedicated document.

Investments in Digitalization

Regarding investment in digital, it is relevant to first point out that the survey investigated the percentage of investment allocated to digital, given the total amount of annual investment, in the two-year period 2020-2021. This temporal clarification is important because the data may be somewhat distorted due to the impact of the pandemic. On the one hand, in fact, the closure of theaters during the lockdown, which obviously caused a reduction in revenue, certainly reduced the willingness to make investments and therefore also the percentage dedicated to digital. On the other hand, however, it is also true that among investments, those in digital may have been the most useful especially in the short term, because of the need to reorganize activities, for example through online streaming, to offer contents in an alternative way.

In fact, by "digital investments", the questionnaire addressed all that money allocated, for example, to the digital development of internal staff, purchase of external services, or the development and implementation of actual digital tools.

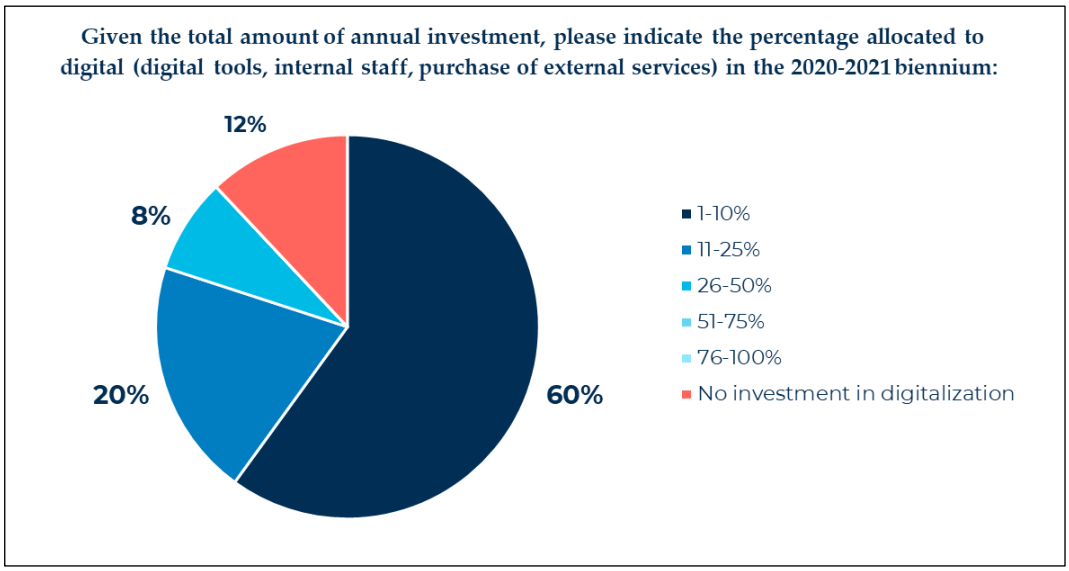


Figure 4.6 - Percentage of investments in digitalization

As displayed in the pie chart, 60 percent of the theaters allocated to digital between 1 and 10 percent of the total amount of annual investments, while the 8 percent of the sample invested between 26 and 50 percent. The remaining 12% of the theaters, then, stated that they made no investments in digital, while no theater invested a percentage greater than 50%.

The fact that only 12 percent of theaters have made no investment in digital in the past two years is a positive sign, as it shows that the vast majority now recognizes at least partially the importance of digitization.

Nevertheless, as a consequence of the responses, the overall KPI is much lower than the maximum.

Category	Avg KPI value
Lyric - Symphonic Foundations	22,1
National Theaters	16,0
Theaters of Significant Cultural Interest	8,3
Traditional Theaters	12,9
Total	**15,0**

Table 4.4 - Percentage of investments, KPI values

In order to better interpret these quantitative results, a value of 15 means that, on average, theaters investments in digitalization are equal to 15 percent. It is

worthwhile considering the different KPIs among categories analyzed since Lyric–Symphonic Foundations has a value which is higher than the total sample mean thus demonstrating higher levels of investments compared with the other categories, while Theaters of Significant Cultural Interest seem to invest less than the average of the sample.

It is then also interesting to analyze how the digital investment budget from 2020 to the present days is distributed across the different areas of the organization, and which activities are considered a priority to invest in over the next two years.

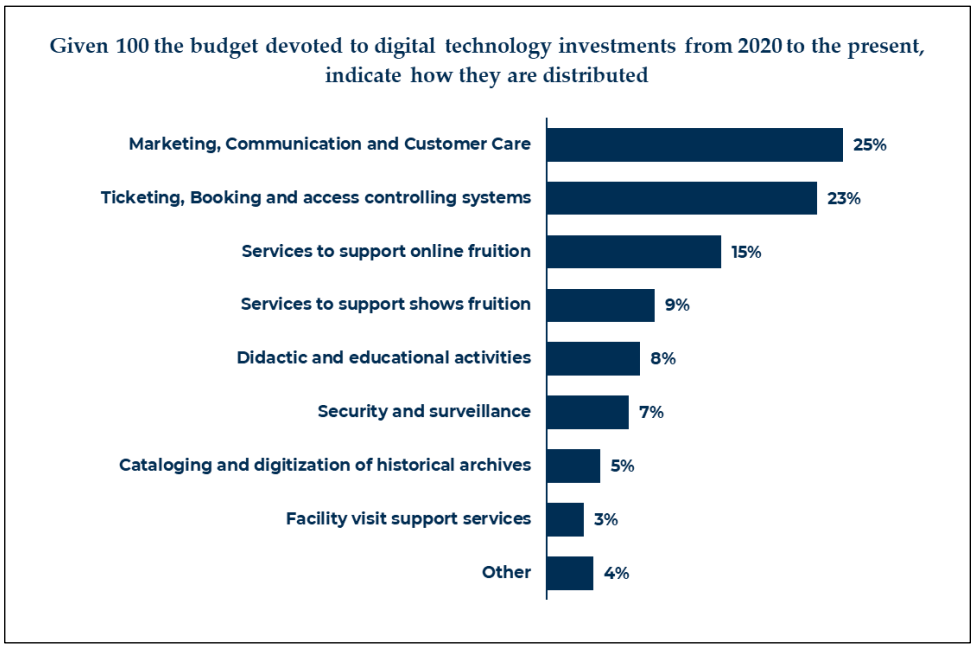


Figure 4.7 - Distribution of investments in digitalization from 2020

In particular, from the bar chart of Figure 4.8, we can see that in the two-years period 2020-2021, the distribution of investments was mainly spread between the areas of marketing, communication & customer care (25 percent), ticketing management reservations and access control (23 percent), and services supporting the fruition of online content (15 percent).

In the next two years, however, the activity in which it is considered a priority to invest is marketing, communication and customer care for 60 percent of theaters, which is consistent with what has been done in recent years. This shows both how technological development in this area has been considered indispensable, but also that still a lot of improvements can be made in the future.

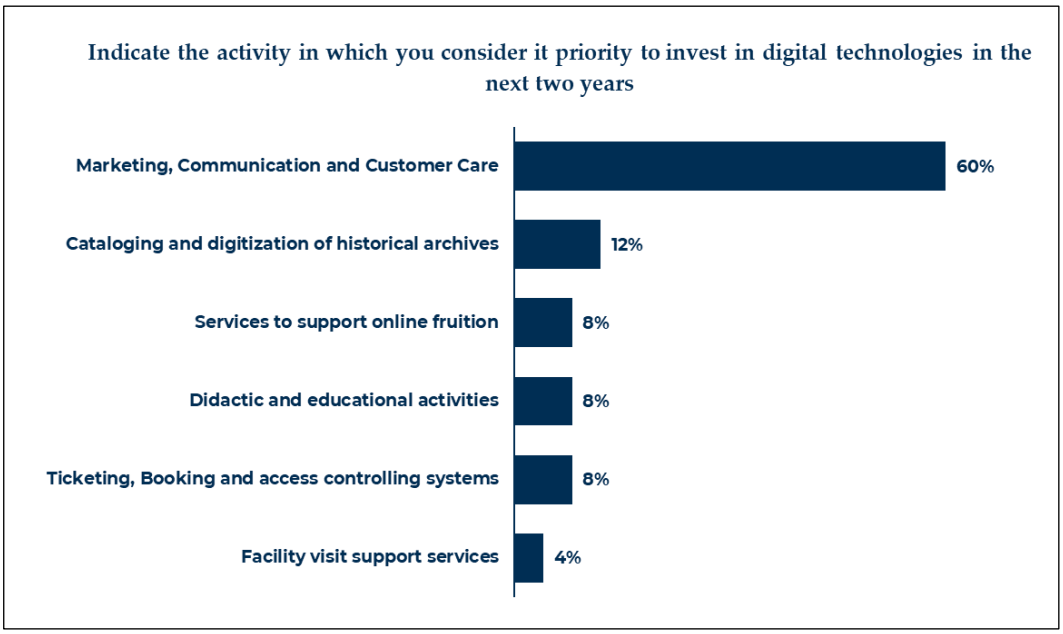


Figure 4.8 - Future investments in digitalization by prioritized activities

What is peculiar, however, is the fact that 12 percent of the theaters said that they considered it a priority to invest in cataloging and digitizing historical archives, while in recent years only 4.6 percent of the annual budget was allocated to this.

4.1.1.2 Administrative activities

As for the strategic dimension of the organizational structure, also the administrative part covers a relevant role and, even if it is not still a frequent practice, integration with digitalization could enhance much better performance for the institution.

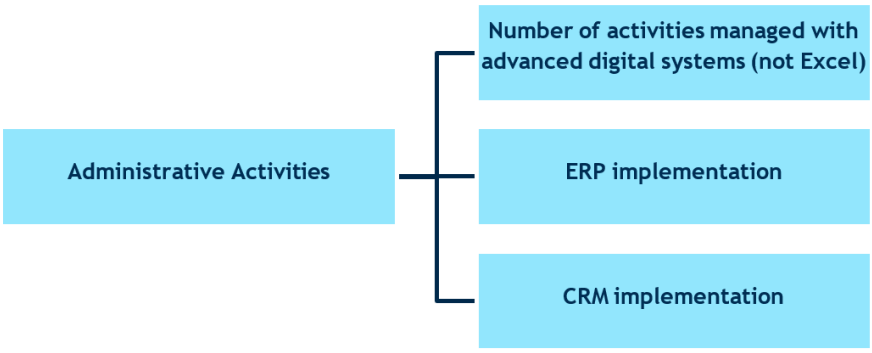


Figure 4.9 - Administrative Activities KPIs

According to the tree represented in Figure 4.10, the questionnaire has been useful to assess the level of digitalization related to the main indicators identified from the Literature Review.

Number of digitalized administrative activities

The results related to the digitization of administrative activities are quite encouraging. Indeed, we can see that all theaters have at least one computerized management system available different from the ones of the Office package.

This is of primary importance for the management of theaters. In this way, indeed, it is possible to streamline processes and to manage the theater organization more smoothly, thanks to greater efficiency, greater ease of document management, and a reduction in the time it takes to process requests.

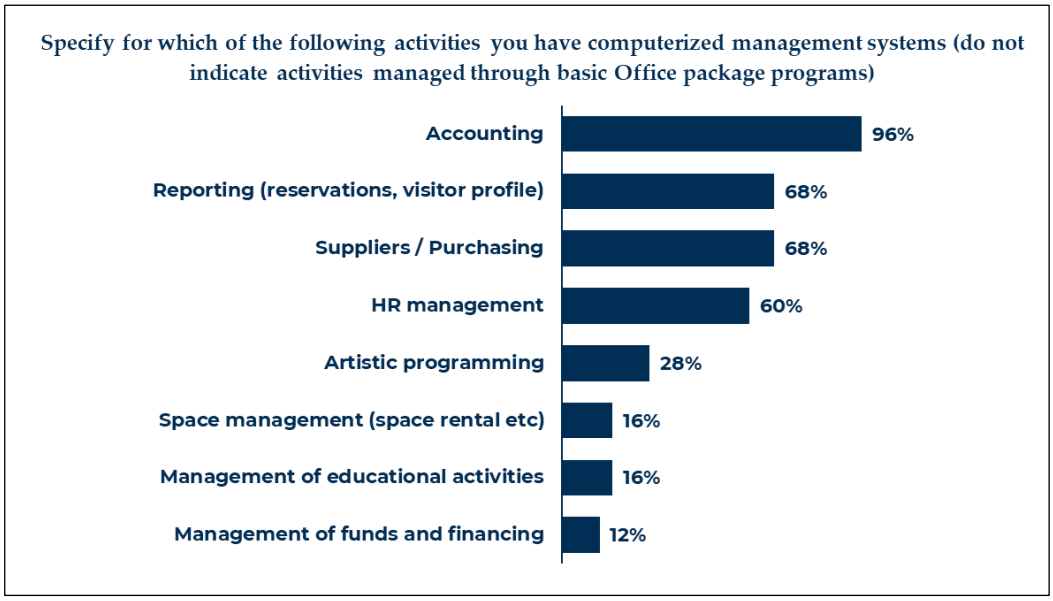


Figure 4.10 - Administrative activities managed digitally

Specifically, 96 percent of theaters have a computerized management system to support accounting, 68 percent have it to support supplier management and purchasing, and again 68 percent have it to support reporting, so for managing reservations and for visitor profile analysis, for example.

The least common management system is for managing funds and financing, adopted by only 12 percent of theaters, but the most interesting finding is that only 28 percent of theaters have a system to support artistic programming. This is peculiar, as artistic programming is one of the core activities of a theater, and therefore managing it in the most efficient and advanced way possible should be among the priorities. The problem, in our view, lies in the still unfortunately ingrained notion that the two souls of the theater, the artistic and the more economic-managerial, are separated and cannot cooperate to reap the benefits of one from the other.

Therefore, the deficiency in this aspect cannot be overlooked, as managing the artistic core of the theater in a more technologically advanced way could bring numerous benefits.

Category	Avg KPI value
Lyric - Symphonic Foundations	51,8
National Theaters	50,0
Theaters of Significant Cultural Interest	35,4
Traditional Theaters	44,6
Total Sample	**45,5**

Table 4.5 – Number of Administrative activities, KPI values

The values of the KPI, both by category and for the whole sample, confirm that, differently from the strategic indicators, theaters have many digitalized activities in the administrative area. Lyric–Symphonic Foundations, together with National Theaters, are the two categories above the average of the statistical sample for number of administrative activities managed digitally through advanced systems. Indeed, their scores explain that at least the 50 percent of the main tasks in administration are digitalized.

ERP and CRM implementation

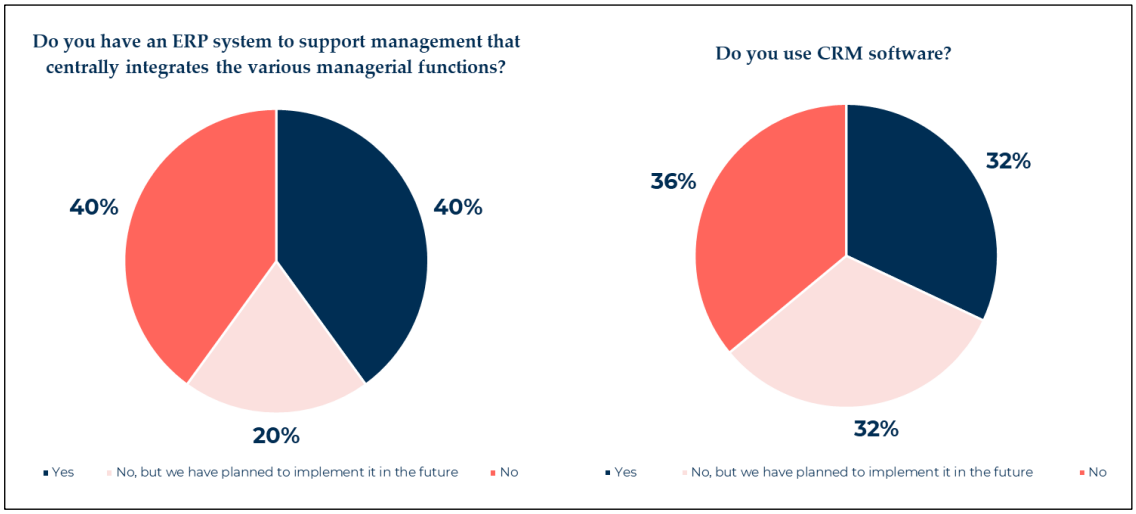


Figure 4.11 - ERP and CRM implementation

In terms of administrative area, it is also interesting to see the percentage of theaters adopting an ERP system. According to the survey, 40 percent of theaters

implemented it, but on the other hand, still 40 percent responded that they do not. Presumably, however, the adoption of this software will become more common in the future, as 20% said they plan to implement it.

As for CRM software, on the other hand, roughly one third of the respondents stated to have it in place, and the same percentage confirmed they plan to adopt it in the future while the remaining 36 % neither implemented and planned to introduce such system.

For both software, therefore, although the percentage of those already adopting it is limited to the minority of theaters, there are positive signs of a change for the future.

As a consequence, the histogram of Figure 4.13, represents the two KPIs computed from the results just described. The values confirm the trend anticipated from the KPI related to the number of digitalized administrative activities, being Lyric Foundations and in particular National Theaters the best performers in terms of ERP and CRM implementation. Concerning the other two categories, instead, values certificate a performance level lower than the average of the total sample.

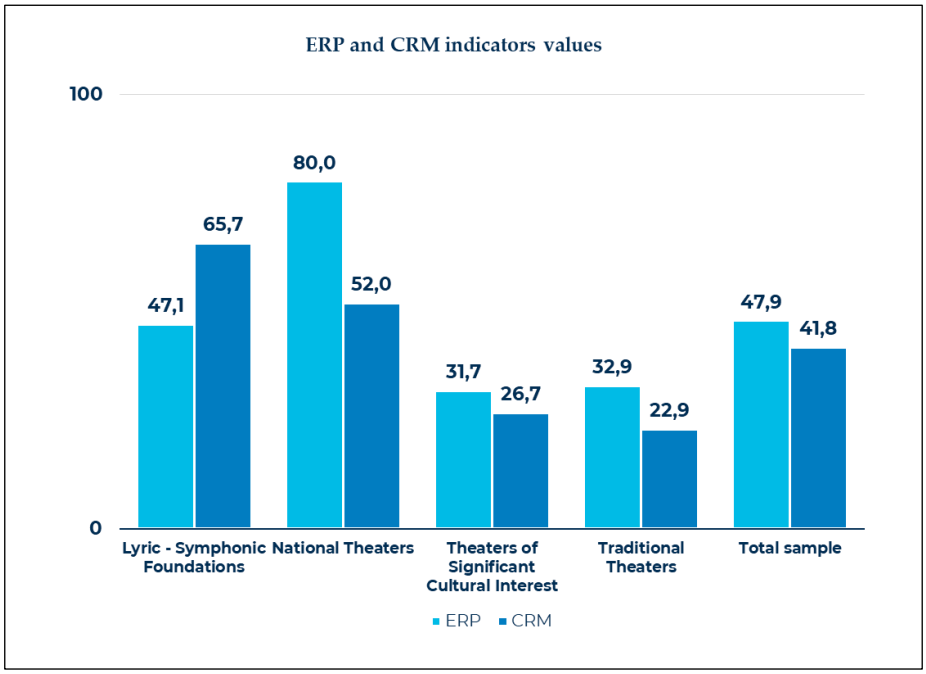


Figure 4.12 - ERP and CRM presence, KPI values

As a consequence of the definition of must-have and delighters in Chapter 3, having planned to implement these systems in the future has been considered as a 30 percent of the total score as it represents the minimum criteria for this KPI.

4.1.1.3 Personnel

Human resources are undoubtedly a fundamental and crucial asset in any organization. Indeed, they contribute to development and enable adaptation to change in society, and the more they are taken care of, the greater the competitive advantage the company can gain from them. Also in theaters, therefore, personnel competences are among the main investments to be sustained. Here, in fact, a multitude of resources actively contribute to the realization of a stage performance, particularly in terms of planning, staging, distribution, administration, and its actual realization.

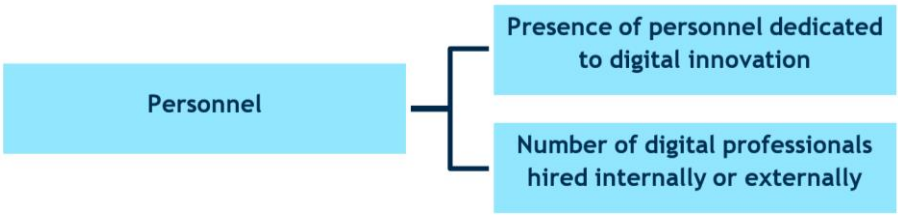


Figure 4.13 - Personnel KPIs

Personnel dedicated to digital innovation

As the staff are the ones who truly provide the company with the necessary skills and tools to evolve and remain competitive in the market, every theater must necessarily have staff dedicated to digital innovation.

In Italy, unfortunately, still 28 percent of theaters do not have staff dedicated to digital innovation.

The majority of theaters 52%, then, have several figures managing digital activities. Then 20 % of theaters of the sample rely on the advice of external professionals, and the same percentage has a dedicated team of several people in-house.

The missed opportunities that could be seized through the creation of a team composed of several people dedicated to digital innovation are, however, remarkable. In fact, digital transformation affects the entire theater management and brings with it a change in the entire way of doing business. Therefore, the

presence of a dedicated team could be a necessary internal force to propel this change so that it is extended throughout the whole organization.

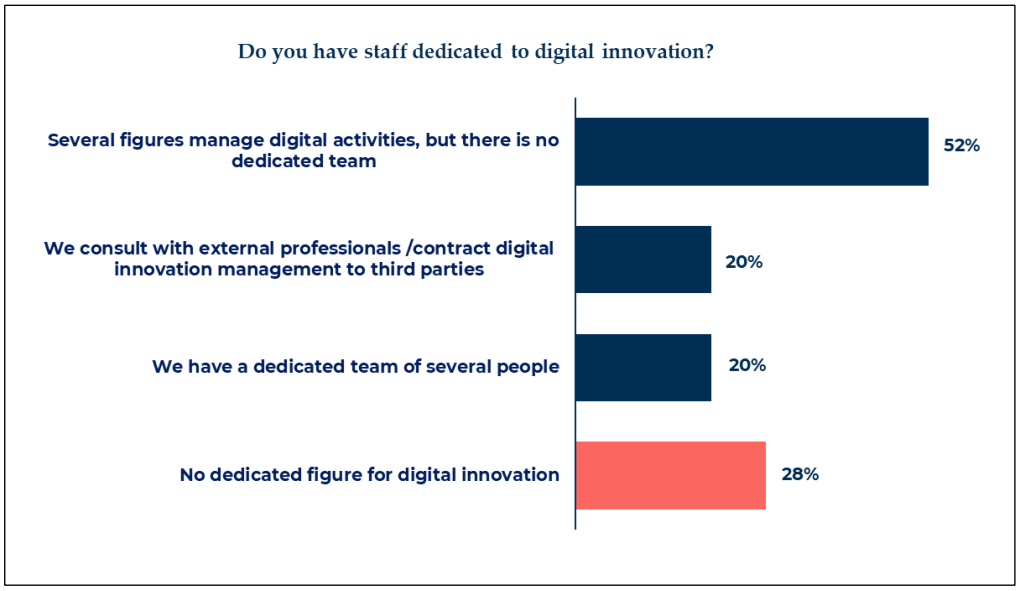


Figure 4.14 - Presence of staff dedicated to digitalization

Looking at Table 4.6 summing up the performance indicator related to the competences dedicated to digitalization, Lyric Symphonic Foundations category has obtained a score lower than the average which is unexpected if considering the results showed in the other digital indicators considered so far. That is because, almost all the theaters belonging to such category, do not have a specific team neither relying on external professionals as they have a configuration based on multiple figures not directly dedicated and specialized in digital innovation.

Category	Avg KPI value
Lyric - Symphonic Foundations	35,7
National Theaters	65,0
Theaters of Significant Cultural Interest	54,2
Traditional Theaters	46,4
Total Sample	**49,0**

Table 4.6 - Personnel dedicated to digitalization KPI values

Most of National Theaters, instead, hire external professionals for digitalization purposes or have a dedicated team developed internally.

Number of digital professionals

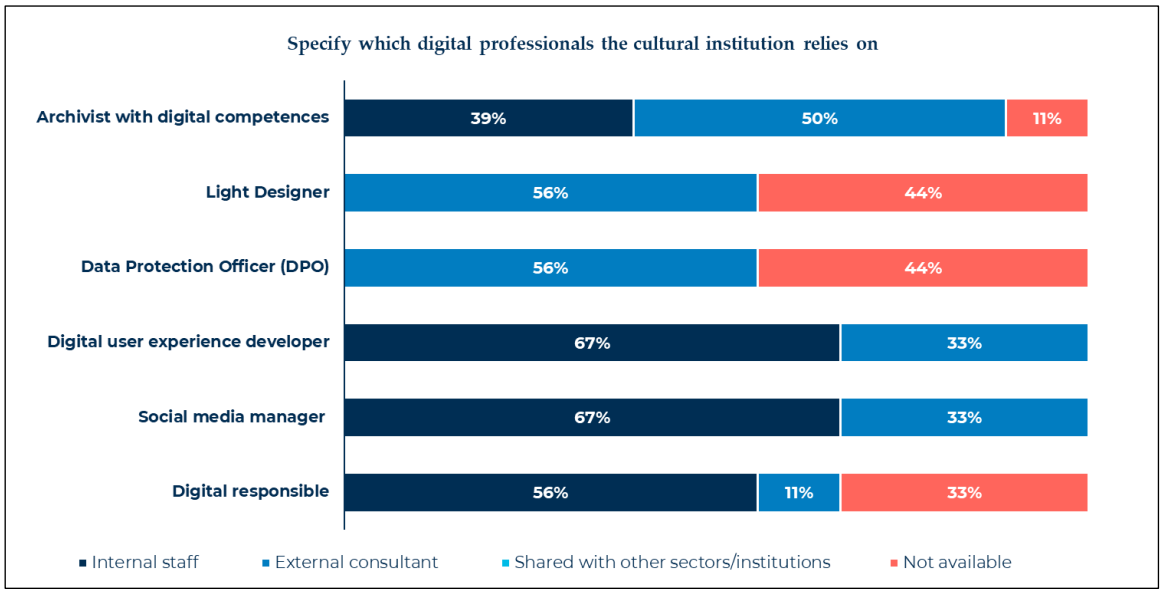


Figure 4.15 - Digital professionals hired internally or externally by the institution

Among the theaters that have dedicated digitization figures, it is important then to note that they all have a social media manager and a developer.

The social media manager, who 67 percent of the time is hired as internal staff and the remaining 33 percent is an external consultant, highlights the growing importance of digital marketing and, in particular, of social media marketing. This figure is fundamental, as confirmed by the survey results, since it allows to communicate the image and value proposition of the theater in a broad way, while also trying to always expand the audience by reaching an increasingly younger target. The fact that all theaters have the social media manager, is a positive sign that the importance of digital marketing is widely recognized.

The user experience developer shows the same results as the social media manager. Designing the organizational structure behind a website and ensuring that the user has a pleasant and easy digital journey, it is crucial in the perspective of digital marketing.

The digital manager, then, is of particular importance because having different responsibilities ranging from marketing to processes, depending on the level of digitization of the organization in which he/she is employed. In 56 percent of the theaters, this figure is part of the internal staff, in 11 percent of the cases he is an external consultant, and in the remaining 33 percent he is not present.

After that, we can see the results of the DPO and light designer, which are exactly the same. Indeed, both figures are hired in 56 percent of cases as external staff and in the remaining 44 percent of cases they are not present in the organization.

The prevalence of the DPO is unsatisfactory. The DPO is, indeed, a key figure in ensuring compliance with the General Data Protection Regulation (GDPR) and it is therefore peculiar that no theater has him as internal staff and that almost half of the theaters do not have him at all.

Finally, the archivist with digital skills is 39 percent of the time hired as internal staff, 50 percent of the time is an external consultant, and the remaining 11 percent of theaters do not have one. This figure is assuming an increasingly key role because of the opportunity he offers to simplify and streamline the process of managing archives, while also making them more user-friendly.

The bar chart below (Figure 4.17) confirms what suggested by the indicator related to the presence of personnel specialized and dedicated to digital innovation. Indeed, also in this case, National Theaters seem to have a much higher number of digital professionals hired internally or externally. For what concerns low performers, Traditional Theater category is the one with the lowest KPI value. Nevertheless, the results of both KPIs of the personnel dimension can be considered overall positive thus suggesting that the majority of theaters considers digital competences as a core aspect to invest on.

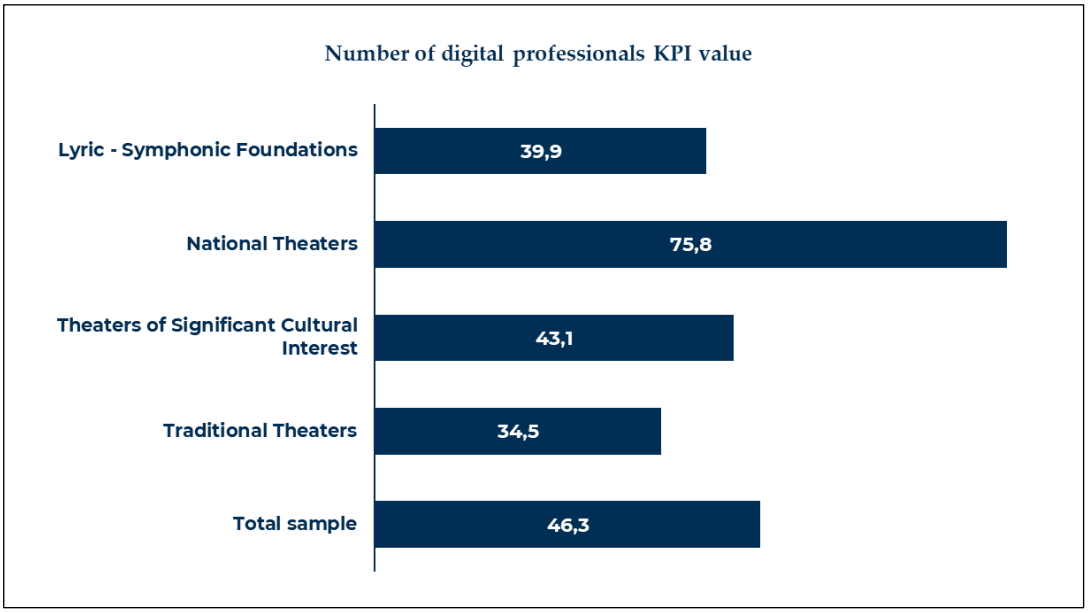


Figure 4.16 - Number of digital professionals, KPI values

4.1.2 Core Activities

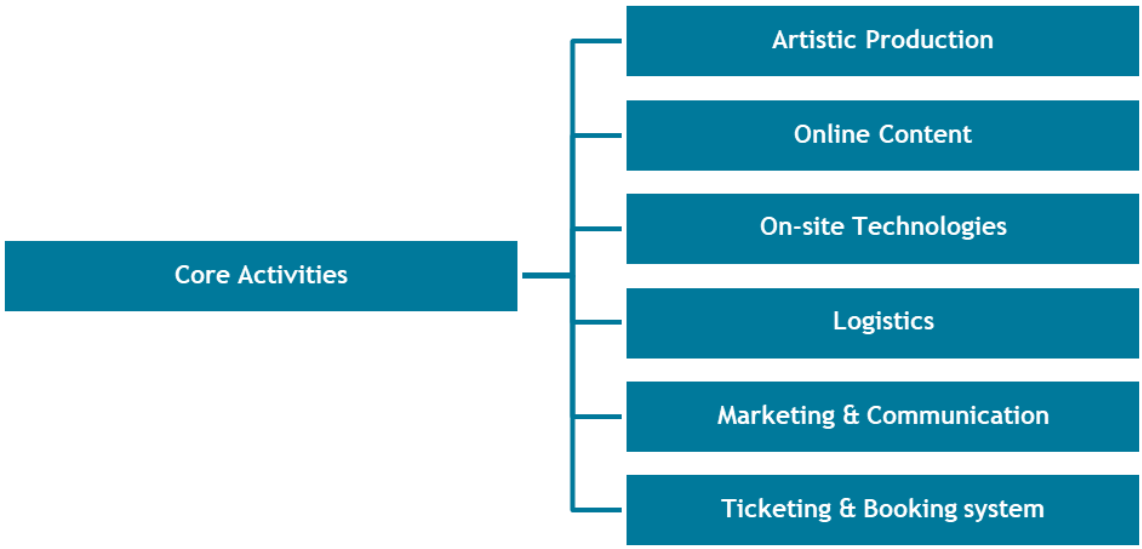


Figure 4.17 - Digitalization area, Core Activities dimension

4.1.2.1 Artistic Production

Figure 4.18 - Artistic Production KPI

In the analysis of artistic production, all the technologies used by the theater for the creation and management of the most cutting-edge performances possible are fundamental. However, it is also crucial the aspect related to the management of artistic production processes, which, through digital technologies, can be simplified and made much more flexible and efficient.

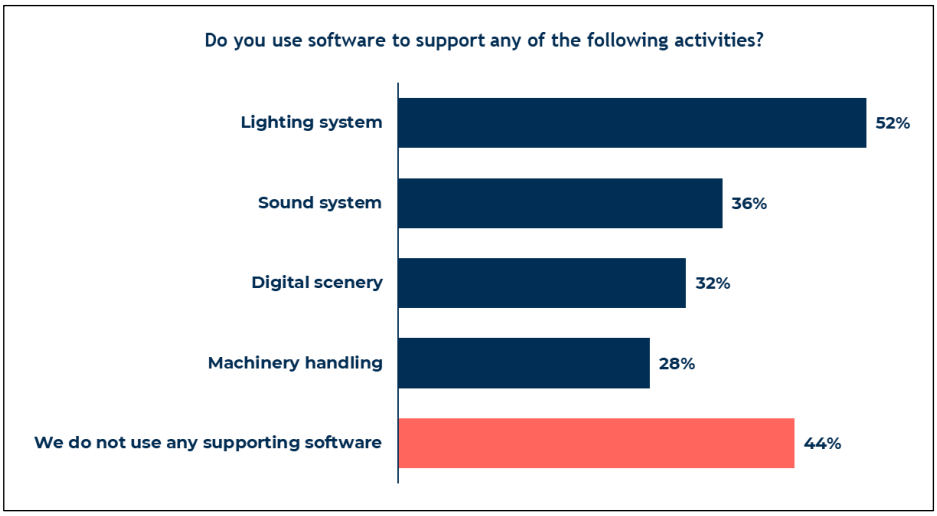


Figure 4.19 - Software / Technologies adopted on-stage

For this reason, it is important to investigate whether theaters adopt specific software to support production activities so as to not only simplify but also enhance the theatrical device.

Forty-four percent of theaters responded that they do not use any software to support activities. This is another negative sign highlighting the lack of integration of technologies within this core area.

On the other hand, however, 52 percent of theaters use software to support the lighting system, 36 percent use them to support the management of the sound system, 28 percent use them for machinery handling, and 32 percent use them for digital stage sets.

Digital stage management software represents a great impetus for the use of digital technologies even within actual theatrical performances, thus leading to the idea of a new theater. This new form of theater, called "multimedia theater", proposes a more immersive form of performance, including digital within performances and making the most of all the possibilities given by technological development, in this specific case for the creation of impactful sets.

However, the results just explained in the section and represented by the bar chart of Figure 4.20, are highly diversified if considering the different categories of theaters analyzed. This aspect is highlighted by the table below containing the values of the driver related to the software adopted on-stage. Specifically, we could divide results into two main clusters. On one hand Lyric Foundations as well as National Theaters with scores respectively equal to 50 and 70 out of 100, have revealed to be high performers for the digitalization of artistic production. Contemporarily, the other categories' scores are much lower than the average of the sample thus highlighting a gap in terms of technology adoption related to this core activity.

Category	Avg KPI value
Lyric - Symphonic Foundations	50,0
National Theaters	70,0
Theaters of Significant Cultural Interest	20,8
Traditional Theaters	14,3
Total Sample	**37,0**

Table 4.7 - Number of technologies / software adopted on-stage, KPI values

4.1.2.2 Online Content

Within the online experience available to customers, it is interesting and crucial to dwell on the opportunity offered by theaters to watch shows via online streaming.

All theaters have been impacted by the lockdown imposed as a restraining measure against the pandemic, and it is very positive to note that the vast majority of theaters have tried to reorganize themselves to provide content in an alternative way and thus to succeed in not completely blocking all activities. The pandemic, indeed, although it has put a strain on the entertainment world, has also stimulated new original planning, giving a push toward the exploration of new ways of fruition and relationship.

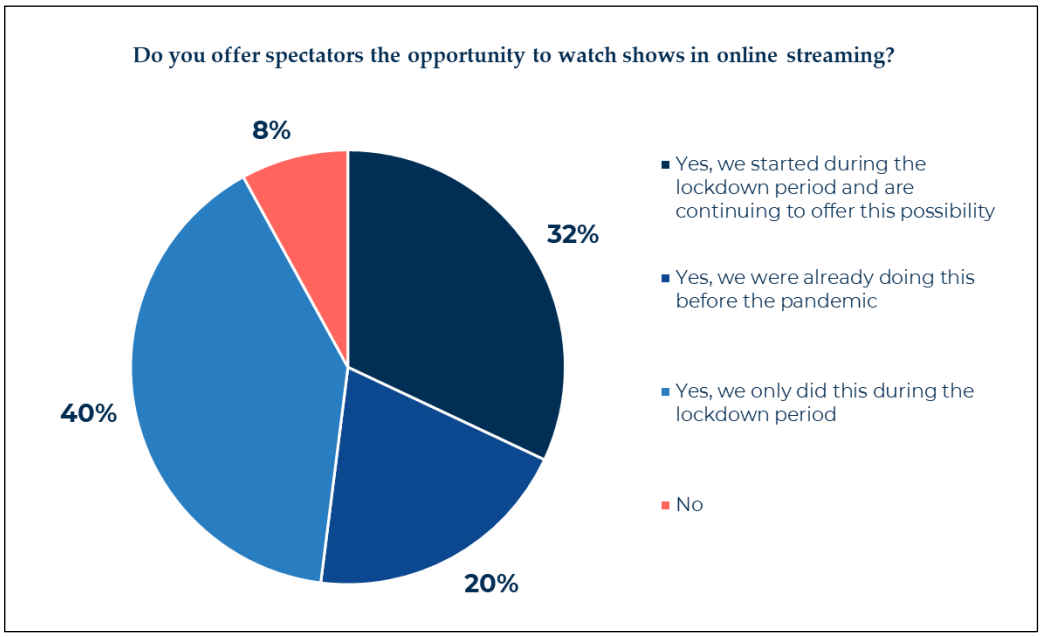


Figure 4.20 - Online streaming

In fact, as we can see from the pie chart, only 8 percent of the theaters responded that they have never offered users the opportunity to see shows via online streaming.

Most theaters, on the other hand, offered this possibility only during the lockdown period, while 32% of theaters started during the lockdown period and are continuing to offer this possibility. This last category, which accounts for about one third of the sample part of this research, is a very positive example of how to continue to take advantage of the opportunities and innovations that

necessarily had to be thought of to counter, at least in part, the problems associated with the forced closures of 2020 and, in part, of 2021.

In addition, 20 percent demonstrated to be more digital mature giving the ability to watch theaters online streaming even before the pandemic, which demonstrates that there were already signs of a necessary revolution in the world of culture and the need for an expansion of the boundaries of live performance. Moreover, having already in place such online service, has represented a factor of resilience against the pandemic disruption.

Then it is also interesting to note the fact that digital culture has not only been used to propose new productions, but also to enhance recordings of past repertoires or to develop extra insights, related for example to everything behind the theater, creating new opportunities for knowledge.

Indeed, when asked, "During the pandemic, did the theater manage to reorganize itself by delivering performances and/or making content available in an alternative way?", 76 percent of theaters responded that they posted unreleased content and videos on their channels.

This is a service offered to customers as part of the online experience but, if implemented properly, it is certainly a relevant successful factor which can be used in the theater's marketing and communication strategy as well.

Table 4.8 highlights the importance of online streaming for the theaters analyzed in the sample.

Category	Avg KPI value
Lyric - Symphonic Foundations	91,4
National Theaters	54,0
Theaters of Significant Cultural Interest	65,0
Traditional Theaters	74,3
Total	**72,8**

Table 4.8 - Online streaming presence, KPI values

Indeed, the average KPI score is equal to 72,8 which, compared with the other KPIs, is a very high value. Another interesting feature of such values is related to the National Theaters' score that is lower than the average because almost all of

them have adopted it only during the pandemic. This result could have two different interpretations: on one side they have been able to adapt to the difficulties of the period providing online contents to their spectators thus demonstrating to be ready to implement digital changes, on the other side they have preferred to dismiss this service after the end of the pandemic period probably because not considered as value adding.

Lyric Foundations are the top performers as all of them had already in place online streaming before the lockdowns or at least they have kept this service also after the pandemic.

4.1.2.3 On-site Technologies

Among the onsite technologies, as already explained, we consider a twofold aspect: on the one hand, all those technologies that are available to the customer to enrich and to make their physical experience in the theater more interactive; on the other hand, we also addressed those technologies at the service of the theater staff to manage customer access and thus to make their entry easier and faster.

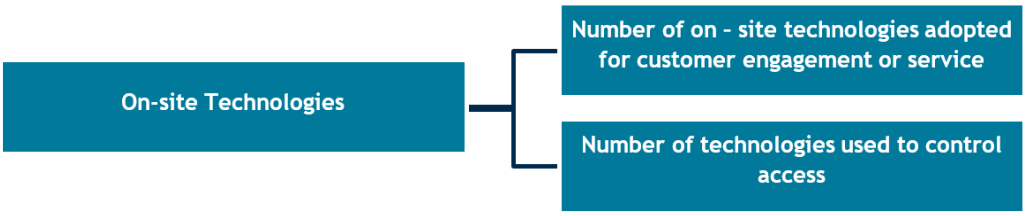


Figure 4.21 - On-site Technologies KPIs

Number of On-Site Technologies

In terms of technologies supporting the customer experience, we see that 32 percent of the theaters do not adopt any technology, which clearly highlights the potential for improvement in this area.

Then 52% of theaters adopt Wi-Fi even though this can no longer be considered as a totally innovative aspect and as an advanced digital technology due to its widespread use and ease of application.

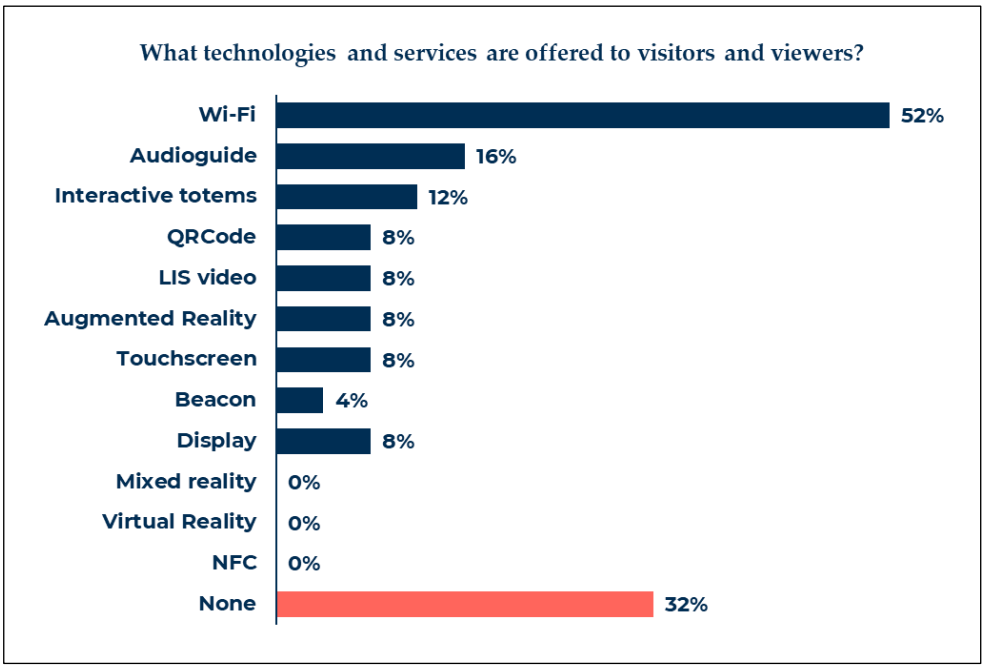


Figure 4.22 - On - site technologies and digital services offered

Displays, Touchscreens, Video Lis and QR-Code are then applied by the same percentage of theaters (8 percent) and, in particular, by theaters that perform museum activities.

A peculiar aspect is related to the presence of theaters, which despite having QR-Code technology available for spectators and visitors, does not use it to check access. This could signal a lack of vision for 360-degree digitization within the theater, also taking full advantage of the technologies that are already available.

The second most used technology, after Wi-Fi, are interactive totems, which are employed by 12 percent of theaters.

Then, the only theater interested in Beacon technology is the Teatro Stabile di Torino, which has begun a digital transformation process as part of SWITCH_Strategies and Tools for Digital Transformation in Culture, the call for proposals supported by the Compagnia di San Paolo Foundation that has enabled the TST to embark on an articulated path of change affecting different aspects of its activities. After the technologies dedicated to the super titling of performances, the project also involves the official app of the Teatro Stabile di Torino, which acquires new features to allow viewers to be informed in real time about all the theater's activities and news and to make the purchase of tickets easier and faster. These include the ability to receive special content when in close proximity to the foyer. In the halls of the theater there are in fact beacons, small

devices that can transmit, via Bluetooth LowEnergy technology, exclusive content, such as information and curiosities, or reserved promotions, to spectators who are near the foyers.

Finally, no theater says it is interested in virtual reality, mixed reality, and NFC technology.

Technologies for access controlling

As for technologies useful in making it easier and faster for spectators to enter the theater and at the same time check them, the following bar chart explains a quite positive trend.

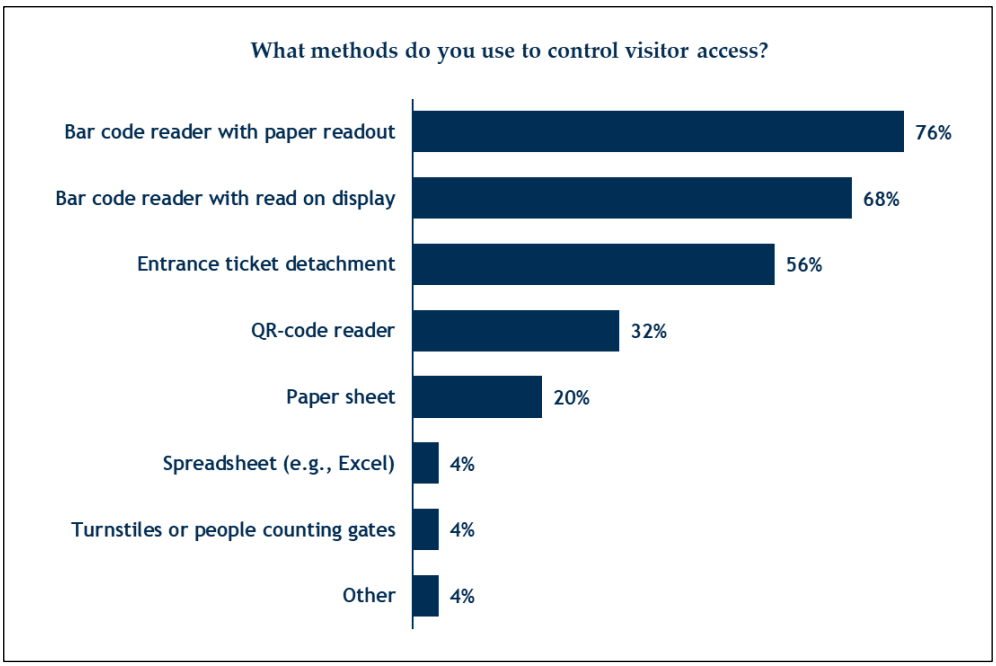


Figure 4.23 - Technologies adopted for controlling visitors' access

The majority of responses (76%) indicate the possibility of reading the bar code on a paper ticket, followed by 68% who indicate the possibility of reading the bar code on a display. QR-Code reading is then limited to 32 percent of cases.

Still widely used, instead, is the access control mode by detaching the entrance ticket. However, it is possible to speculate that this possibility will increasingly diminish and that gradually the paper ticket will be retired to be replaced by a single digital version.

For what concerns the KPIs computation regarding the on-site technologies sub-dimension of the model, it is directly observable from the histogram (Figure 4.25) that most of theaters have a low number of digital services and technologies for the engagement of spectators and visitors out of the ones proposed in the questionnaire.

Different analysis could be done regarding the digital tools adopted to facilitate controls. Indeed, as easily observable from the higher height of the bars, each category has a higher level of performance under this KPI. This result has been probably facilitated by the increasing importance of controls arose after the pandemic.

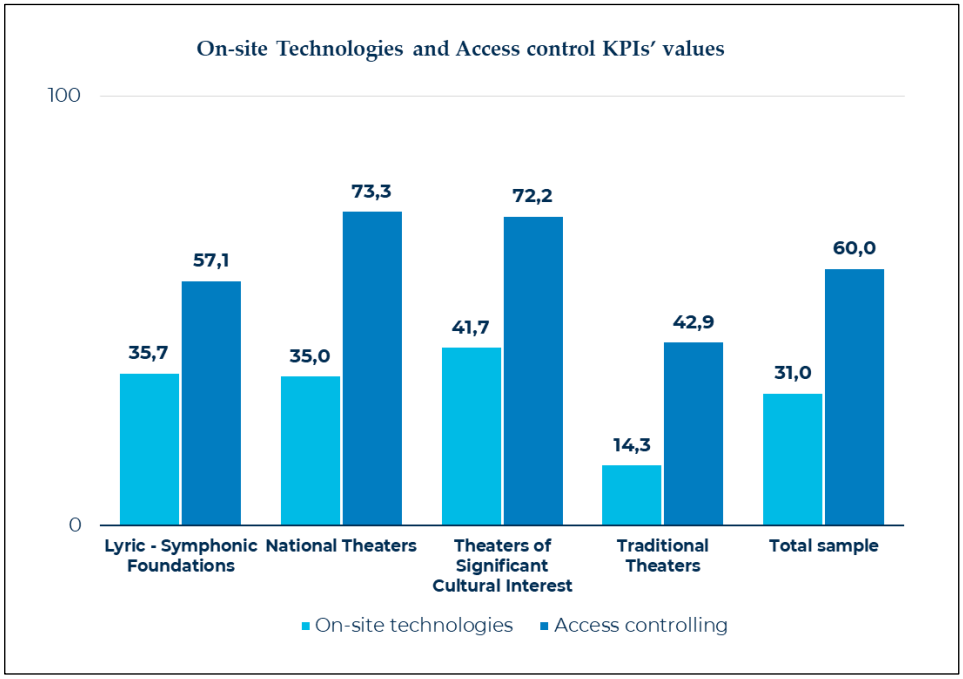


Figure 4.24 - Number of onsite technologies and technologies used to control access KPIs

4.1.2.4 Logistic

Figure 4.25 - Logistic KPIs

Digitalized Archives

The management and preservation of historical archives, and in particular, the evaluation of the percentage in which they are digitized is an interesting aspect to consider.

Indeed, the digitization of historical archives allows for more secure conservation and obviously for an easier consultation. The use of these technologies, which today are advanced and also widely used in the management of archives in every field, creates extraordinary research opportunities for scholars and for sharing and dissemination of data. Since 2000, even the European Commission, in its eEurope policy, has stressed the importance of digitizing our cultural heritage, and this work continues today as part of its Digital Agenda.

Fortunately, most theaters digitize their archives, at least to a minimum amount.

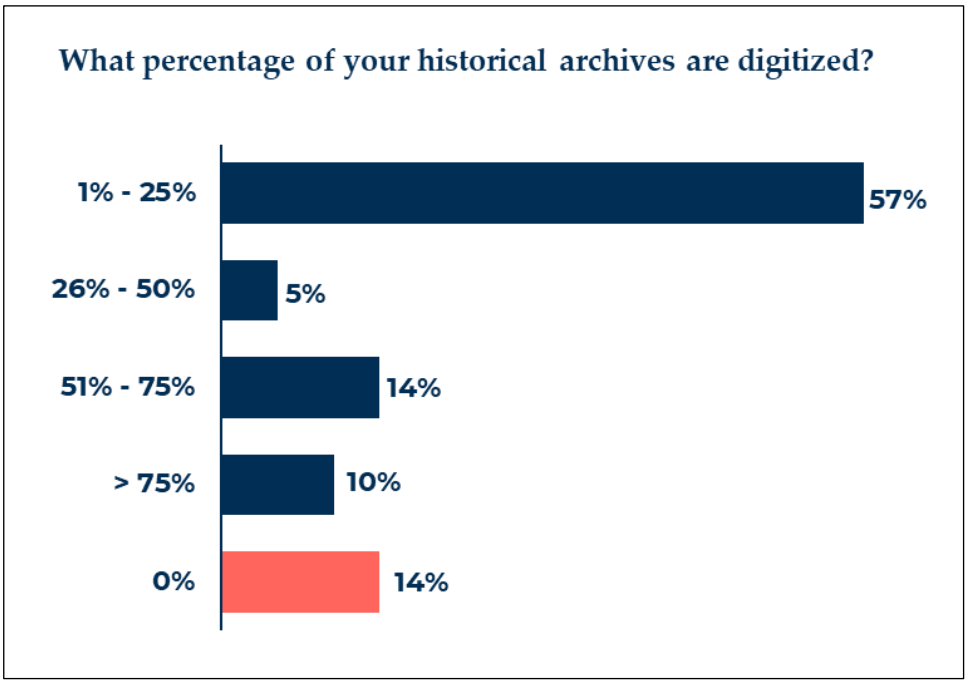


Figure 4.26 - Digitalization of archives

Specifically, 57 percent of theaters when asked "What percentage of your historical archives are digitized?" responded that they have digitizing their archives between 1 and 25 percent.

Then, 29% of theaters ranged between 25% and more than 75%, although theaters with percentage of digitized archives greater than 75% are only a small fraction (10%).

Alongside this, however, it is important to point out that all the theaters that have a percentage of digitized archives greater than 50 percent, have the figure of the digital archivist hired as internal staff, which is very consistent and certainly necessary for proper and effective management of the archive, which then becomes a relevant activity within the theater.

In contrast, 14 percent of the theaters do not have digitized archives at all.

Category	Avg KPI value
Lyric - Symphonic Foundations	46,4
National Theaters	50,0
Theaters of Significant Cultural Interest	16,7
Traditional Theaters	14,3
Total Sample	**31,0**

Table 4.9 - Percentage of digitalization of archives, KPI values

The computation of the related KPI, following the methodology explained in Chapter 3, summarizes the result of the survey. In order to give a concrete vision of such indicators, on average, the percentage of digitalization of the archives among the four categories is about 31 %. Also in this case, however, National Theaters and Lyric Symphonic Foundations perform much better than the remaining categories, confirming their higher attention to digitalization also on this specificity.

Tracking Technologies

It is also relevant to analyze whether tracking technologies are used for the management of the theater's staging inventories.

Here we can see how still many improvements can be made in this area. The logistics of a theater, in fact, is not different from that of a "traditional" business. The presence of equipment, sometimes very expensive, including lights, microphones, cameras, costumes, and various objects, which are stored inside warehouses, and which must be moved, with a rather high frequency, even between different theaters require particular attention in terms of real time traceability.

For this purpose, RFID technology could bring significant benefits, providing a high level of efficiency, flexibility, automation and also giving the possibility of manual intervention in special situations.

As represented by the pie chart below, 68% of the theaters do not use any technology, while 12% of the theaters use RFID technology, and the remaining 20% plan to adopt them in the future.

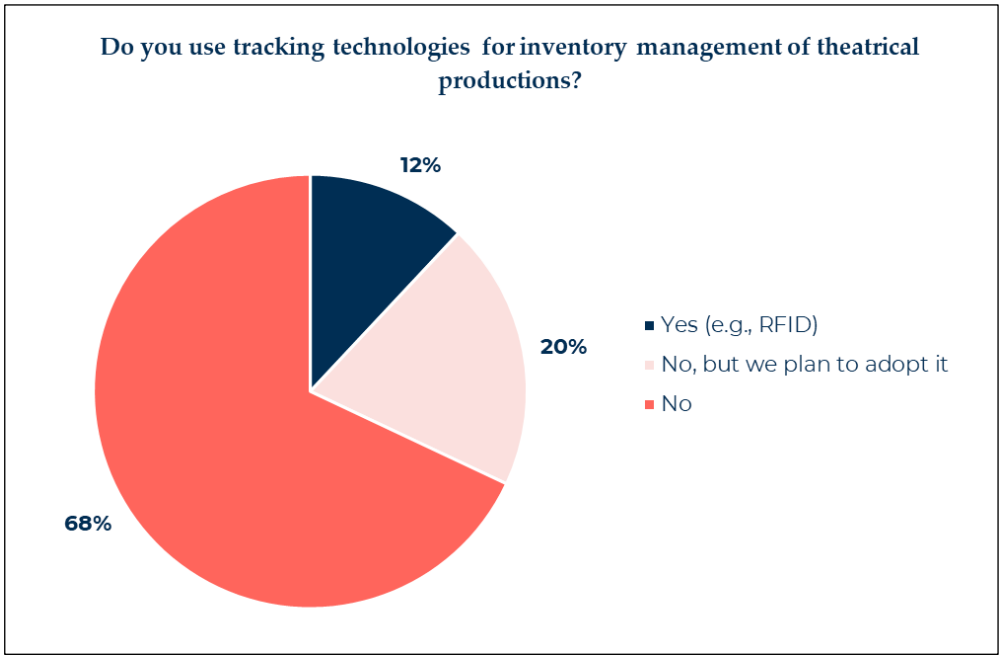


Figure 4.27 - Tracking technologies for inventory management

As a consequence of the low percentages of adoption of such technologies, the digital indicator measured has assumed low results. Indeed, the average value among all the theaters of the sample is equal to 18/100. Moreover, as for the other logistic indicator, the best performers are National Theaters and Lyric Foundation whose scores are respectively equal to 26 and 22,9.

Category	Avg KPI value
Lyric - Symphonic Foundations	22,9
National Theaters	26,0
Theaters of Significant Cultural Interest	10,0
Traditional Theaters	14,3
Total Sample	**18,0**

4.1.2.5 Marketing & Communication

Because of the high number of opportunities in terms of digitalization, to assess the level of digital maturity of theaters related to Marketing & Communication activities, has been necessary to deepen many indicators as shown in Figure 4.29.

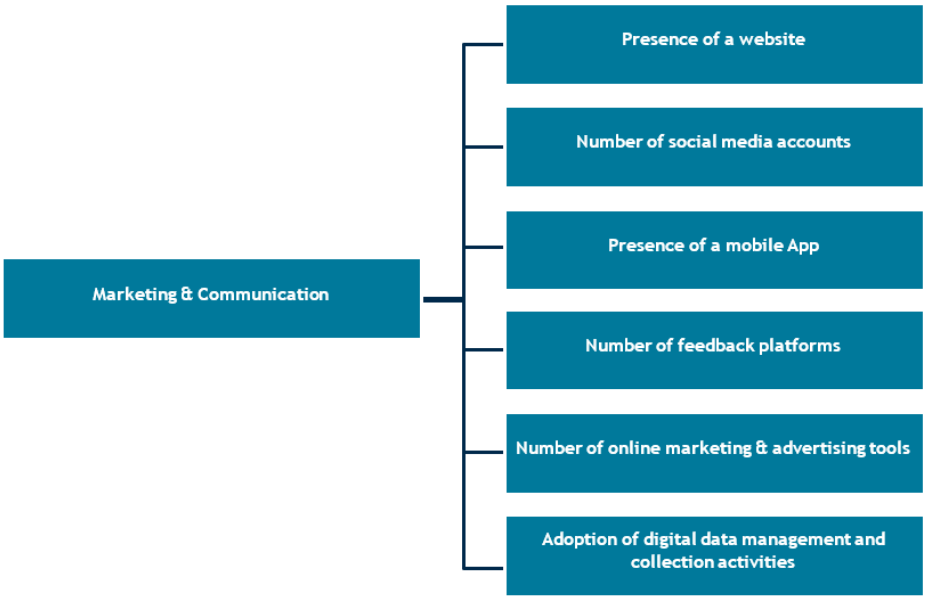


Figure 4.28 - Marketing & Communication KPIs

Accordingly, the following sections are aimed at analyzing both the responses to the survey and the related values of the different KPIs associated to such digitalization area

Website and Social Network

In the world of communication, the most popular tools used by theaters to promote their seasons and to create a relationship and a connection with the customer are, at the same time, the use of social networks and the presence of a proprietary website.

Obviously, although they have slightly different specific goals, it still remains evident how the two channels are complementary and better exploit their potential when used together. In fact, the social presence allows for greater user engagement and also for a more direct communication of the theater's reality, while a website lends more credibility to the theater and allows for more extensive marketing activity, surpassing social networks in variety of content.

The structured solidity of a website, indeed, is ideal for encapsulating the essence of the theater, while the immediacy of social networks is suitable for its distribution. The combined use of these two tools, therefore, potentially makes it possible to reach a very wide audience.

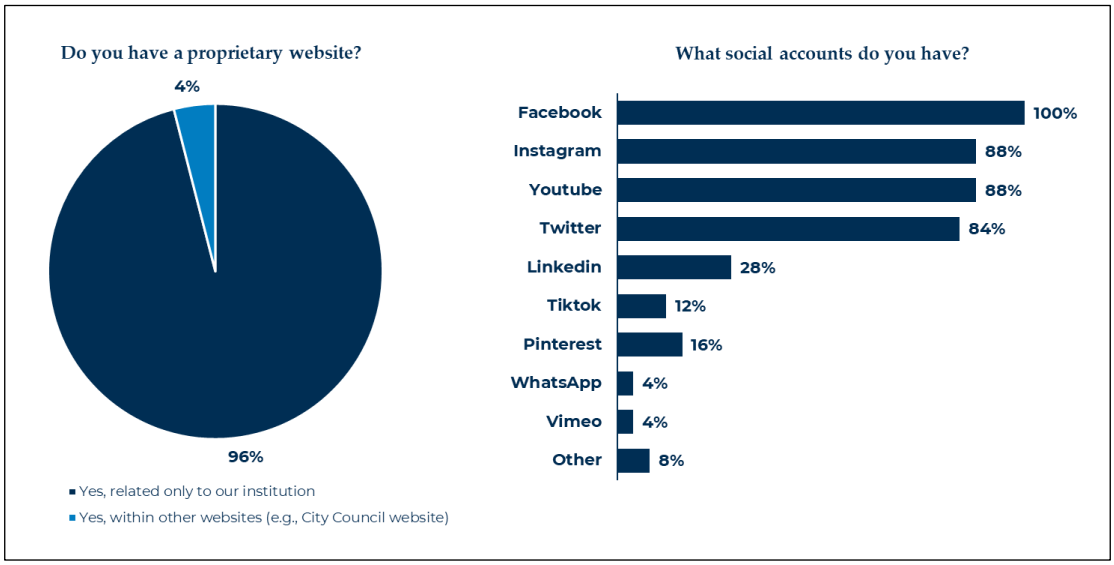


Figure 4.29 - Website and Social Networks used by theaters

So, thanks to the analysis, it is possible to count that 100% of the theaters responding to this survey reported having a proprietary website. Specifically, 96% of the theaters have it related exclusively to their own institution. The remaining 4%, on the other hand, have its dedicated web section within other websites.

Concerning Social Networks, instead, the most frequently used is definitely Facebook: in fact, all theaters have stated to have an account on this social.

Creating a Facebook page brings countless benefits. First of all, it allows to use the bulletin board as if it were a real billboard. It also gives the opportunity to actively promote content by selecting the specific target audience you want to reach. Finally, it makes it very easy to monitor visits, shares and likes, immediately giving an idea of how the advertising campaign is going.

In second place tied, then, we have the use of Instagram and YouTube by 88 percent of theaters.

The latter, in particular, allows to post more and structured and original content that can interestingly retain theater fans, for example. Also, especially in times of

pandemic, it has been crucial in keeping the relationship between theaters and audiences alive by sharing unedited content.

After that we have Twitter, used 84 percent of the time, followed then in the minority by LinkedIn, Pinterest and TikTok.

A mention can be made about the use of WhatsApp, which although not yet widely spread, allows theaters to have a direct relationship with the customer, for example to request information, make reservations, change shifts and receive promotions.

It is also interesting to assess whether theaters, in addition to being actively present with marketing and communication campaigns on social media, also engage in their monitoring to assess their performance and audience reactions. In particular, it was found that 98 percent of theaters perform this monitoring, and this is probably due to the availability of the analytical tools offered by the social network itself and their ease of use. In fact, 94 percent of the theaters said they use the tools provided by the social media, while only 4 percent use other, more advanced ad hoc analytical tools.

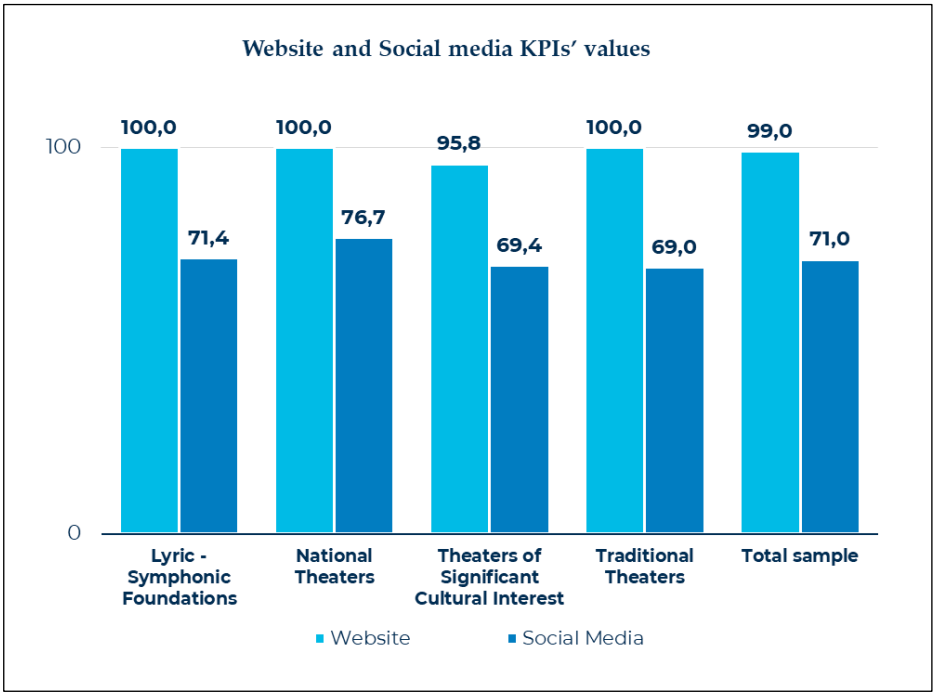


Figure 4.30 - Website presence and Social Network accounts' number KPIs

The bar chart above shows the maturity of theaters under the two aspects just analyzed. In particular, as already seen from the survey's results, the website is a must-have among the theaters analyzed. Contemporarily, all theaters are

present in more than one social network without substantial differences among different FUS categories.

Mobile App & Feedback Platforms

Another tool widely used in general by institutions as a disseminator of their content and as a marketing vehicle is the implementation of a mobile app, available for smartphones and tablets, for example.

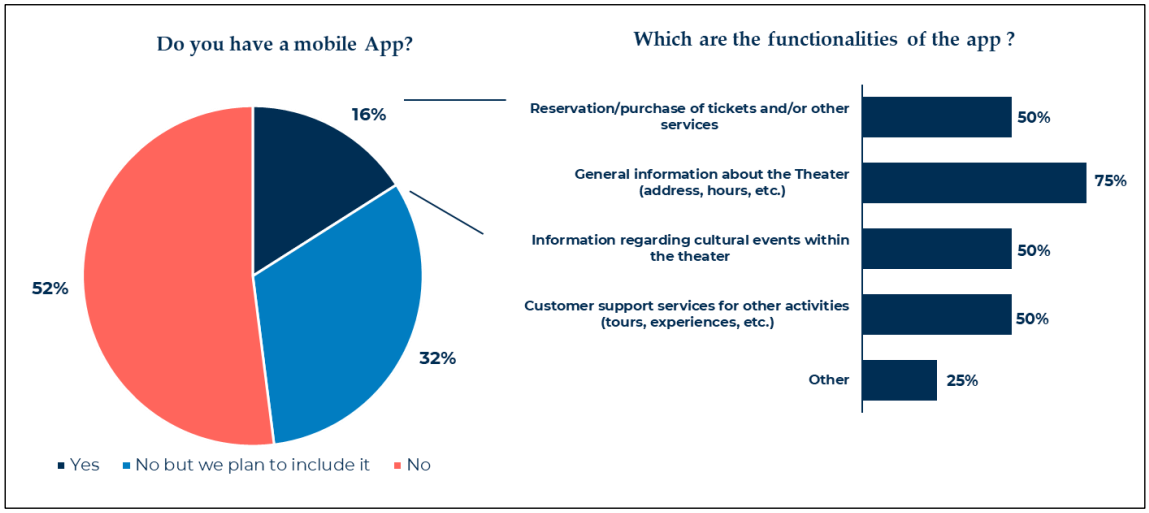


Figure 4.31 - App presence and functionalities

This, despite the fact that the whole world is now aware of the many benefits it can bring, is still not widely used by theaters. In fact, it has been estimated that only 16 percent of theaters have developed one, while the remaining 84 percent do not use it. Among them, then, only 32% has planned to implement it.

Among the few theaters that are already actively using the app, we see that the main feature that should characterize its functionalities, for 75% of the cases, is the presence of general information regarding the theater.

Then, of equal importance are considered functions such as the presence of information regarding cultural events within the Theater, the possibility to reserve or purchase tickets and/or other services, and the availability of customer support services for other activities such as tours or other experiences.

This is particular, because the cost of developing an application is not justified if the most distinguishing feature is the presence of generic information that is readily available via the Internet. Moreover, these also do not justify the onerousness of downloading the application for the client.

Therefore, there is perhaps a need for better implementation of mobile device applications, which must be truly incorporated into a structured and coherent digital marketing strategy in order to be effective.

Another unavoidable aspect for theaters is the management of criticism, which today, with the advent of online platforms and the ability to leave comments online very easily and quickly, has become even more widespread and ruthless.

The power of feedback should not be overlooked, because it can then seriously influence the choice of other users.

Moreover, it takes on a double meaning: on the one hand, it refers to the actual theater criticism, thus on the stage performance; on the other hand, it refers to the customer's complete experience both online and onsite.

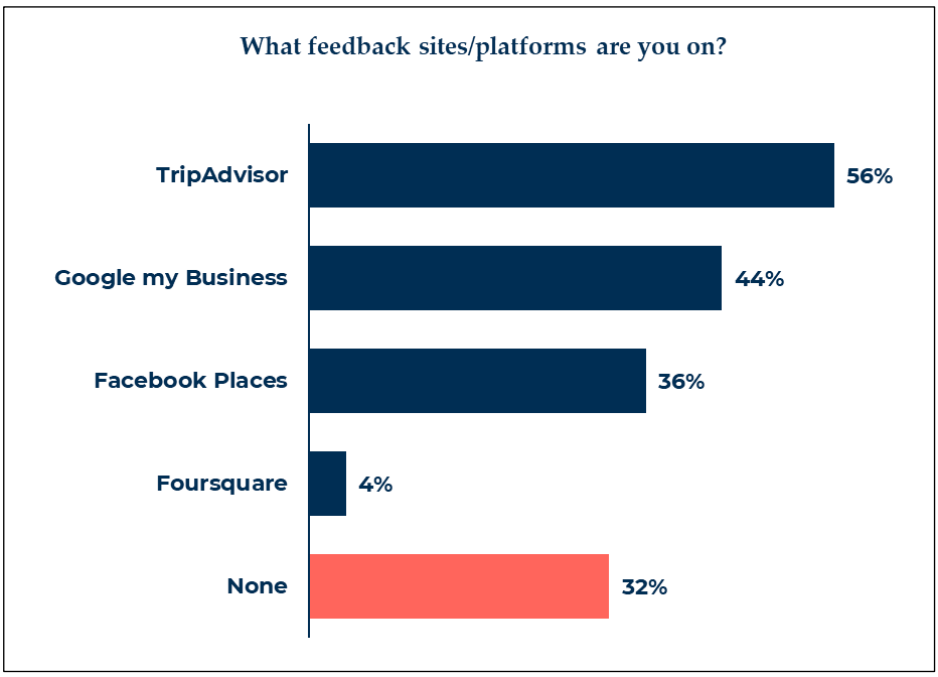


Figure 4.32 - Feedback platforms usage

For this reason, it is necessary to assess the presence of theaters on review platforms and whether, and how, reviews are handled.

As we can see in the figure, 56% of theaters are present on TripAdvisor, followed by 44% on GoogleMyBusiness and 36% on Facebook Places. Only 4% are then present on Foursquare, while 32% of theaters are not present on any platform.

Theaters present on at least one of these platforms, then, when asked "Do you perform review monitoring and management activities?" answered 52% of the time no. The remaining 48 percent of theaters, however, simply read reviews and respond where necessary, but none manage them through ad hoc analytic tools. This demonstrates little attention to the power and impact that reviews can have on other users, not least because as they impact consumer choice of any object, they are also quite relevant in the choice of theater product.

Category	App presence KPI	Feedback Platforms KPI
Lyric - Symphonic Foundations	32,9	52,4
National Theaters	26,0	80,0
Theaters of Significant Cultural Interest	20,0	38,9
Traditional Theaters	22,9	23,8
Total	**25,6**	**46,7**

Table 4.10 - App presence and Feedback Platforms, KPIs values

Looking at the table containing the scores related respectively to the presence of mobile App and the Feedback platforms, it is possible to notice how results are highly differentiated among categories. In both cases, Lyric Foundations and National Theaters are the top performers. At the same time, it is worthwhile pointing out that the mobile app is not yet considered as a priority for digitalization while the presence on feedback platforms is a more common feature.

Online Marketing & Data Management

Finally, in the area of online communication, it is also relevant to study the online marketing and advertising tools adopted by theaters together with the importance of collecting and managing data about the audience in order to improve accordingly.

Positively, the most widespread online marketing tools for the large majority of theaters are the online and social network advertising. Strongly connected to that, there is the use of social media to drive the internet traffic to the website or for other marketing practices and, of course, when used in combination with online advertising increases the effectiveness and benefits of these strategies. Positively, in fact, 77 percent of theaters adopt this tool.

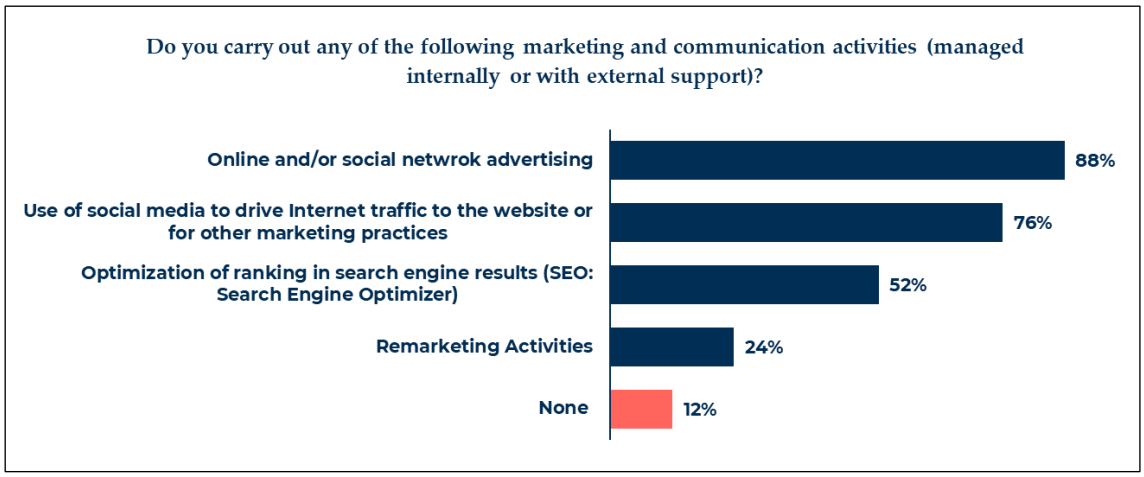


Figure 4.33 - Online Marketing tools

After that, SEO is used by about one in two theaters, which is another great signal. Indeed, it, by improving the theater's ranking in search results, greatly increases the number of visits.

Only 24%, instead, carry on remarketing activities and, unfortunately, the 12% of theaters do not adopt any kind of online advertising strategy.

Another important activity within theater marketing is the collection and management of user data both to implement more efficient marketing strategies and to ensure an omnichannel experience for users.

Data has indeed been called the "new oil" in future, and theaters cannot ignore its importance either. In fact, fortunately, only 16 percent of theaters still do not collect data, while 40 percent collect data through paper collection and 80 percent collect data digitally that means that part of the sample collect them adopting both the methodologies.

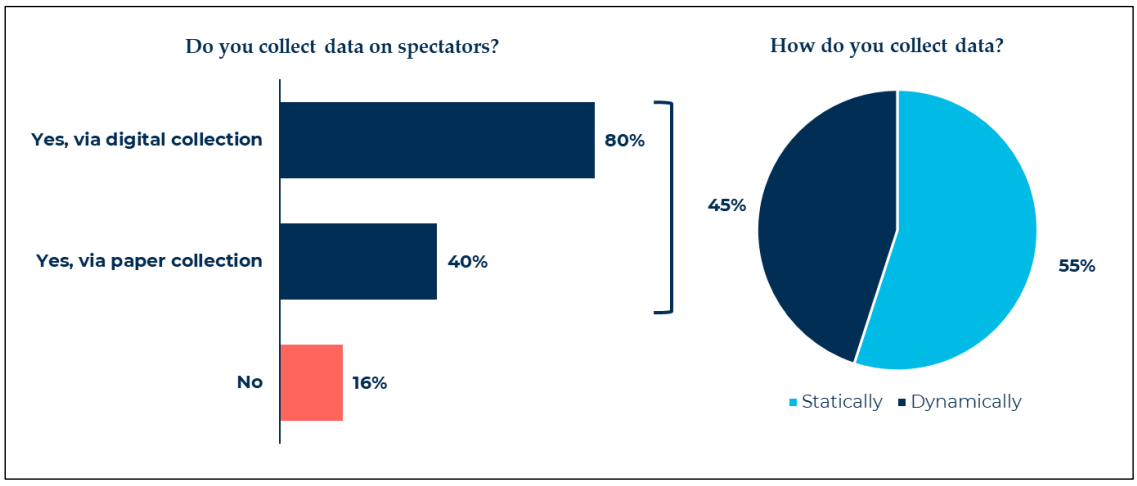


Figure 4.34 - Data collection and methodology used

What is also interesting to notice, is the way in which data are digitally collected. Indeed, from the pie chart of Figure 4.35, about half of the theaters collecting data (45%), performs this operation in a dynamic way, i.e., through real-time or delayed updates as new information becomes available or there are new data acquisitions, while the remaining portion collect them one-time and without periodic updates

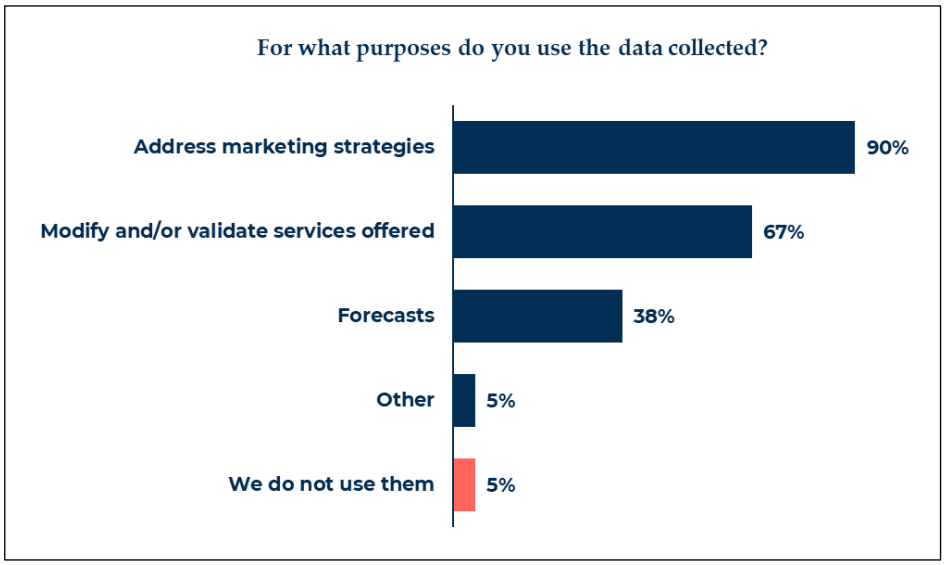


Figure 4.35 - Purposes of data management

The bar chart above, instead, highlights as the main purpose for which data are used, precisely in 90% of cases, is to target marketing strategies. After that, they are also used by 67% of the theaters to modify and validate the services offered by the theater, and finally, for 38% they are used for forecasting purposes.

To a very small extent, i.e., by 5% of the theaters, these are not used, which makes no sense since once you go through the trouble of collecting and managing them it is worthwhile to make them useful.

Finally, Figure 4.37 expresses how each category has good performance levels in both digital indicators. Both National Theaters and Lyric Foundations, have higher than the average results. In particular, these values means that they have in place most of the advertising tools proposed in the survey and at the same time, they collect and manage data mostly dynamically and using them for many different purposes.

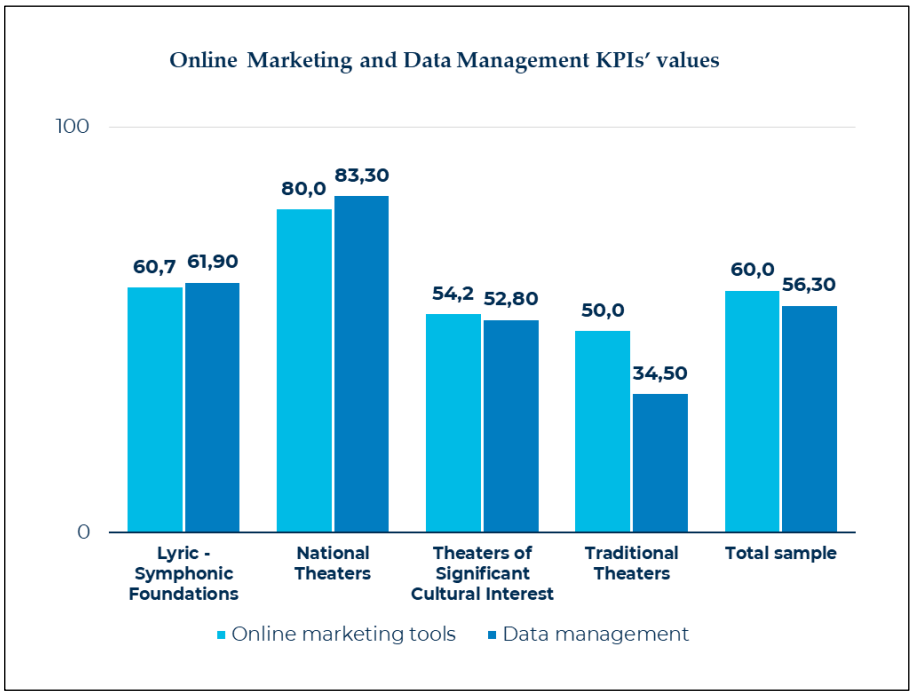


Figure 4.36 - Number of Online marketing tools and Data Management KPIs

4.1.2.6 Ticketing and Booking

Figure 4.37 - Ticketing and Booking KPI

In order to analyze the digitization of the ticketing and booking system it is interesting to see if theaters give the possibility to book tickets with digital channels and if so, what percentage and how well these services are taken care of. It is convenient in this regard to note then the distribution of ticketing revenue by sales channel.

As expected, the main sales channel in theaters is on-site ticketing. This is also the most traditional channel and the one that most allows you to have human contact, so that a relationship with the theater is built up early on.

After that, however, it is good to see that the second source of revenues comes from the theater's proprietary website or app, and not from other physical channels, thus underscoring the importance of keeping this service active and curated.

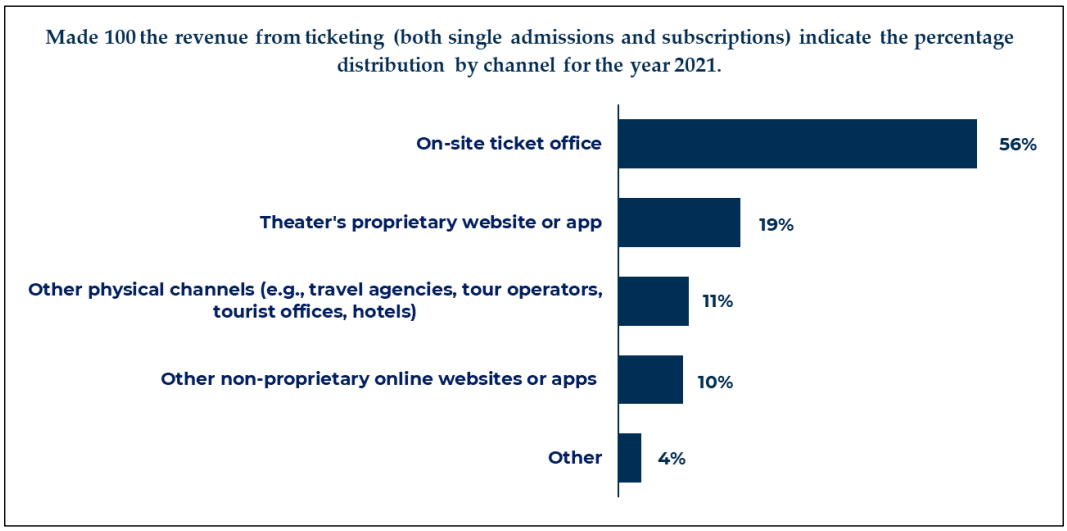


Figure 4.38 - Ticketing revenue distribution by channel (2021)

In any case, the fact that tickets are bought quite frequently through online channels probably also benefits from the fact that the ability to select a seat is also guaranteed online.

The performance indicator selected for this dimension, given that all theaters have at least one online ticketing channel, has been computed as the percentage of sales coming from online channels.

The Table 4.11 shows the results of such KPI confirming what stated by the description of the survey above. In particular, also under this dimension of the model, Lyric Symphonic and National Theaters appeared to be more digitalized than the other categories. Nevertheless, the digital channels are not yet highly used by spectators to acquire and book tickets as, on average within the whole sample, the percentage of sales coming from such networks is lower than 30 percent.

Category	Avg KPI value
Lyric - Symphonic Foundations	39,6
National Theaters	31,4
Theaters of Significant Cultural Interest	18,7
Traditional Theaters	26,6
Total	**29,3**

Table 4.11 - Online ticketing, KPI values

4.2 Model Dimensions Analysis

After having analyzed the responses to the survey and computed the relevant KPIs associated, it is possible to deploy and quantify the main dimensions of the Digital Maturity model developed in the Master Thesis.

This section will start by evaluating the different digitalization area which are assessed as a weighted sum of the related digital indicators. Subsequently, the Organizational Structure and Core Activities indexes will be assessed to compute the Theater Digital Maturity.

The last step of this chapter is based on the classification of theaters following the statistical clustering methodology introduced in the section 3.4.2.

4.2.1 Organizational Structure dimension

Starting with the Organizational Structure dimension, from Table that in general the most deficient area where theaters pay the least attention to is strategy.

Category	Strategy	Administrative Activities	Personnel	Organizational Structure Index
Lyric - Symphonic Foundations	21,8	54,9	37,8	38,2
National Theaters	18,0	60,7	70,4	49,7
Theaters of Significant Cultural Interest	16,7	31,3	48,6	32,3
Traditional Theaters	17,1	33,5	40,5	30,4
Total sample	**18,5**	**44,4**	**47,7**	**36,8**

Table 4.12 - Organizational Structure Index assessment

In fact, all the FUS categories scored less than half of what they scored in administrative activities. This is a rather negative sign that shows that it is still difficult to perceive the importance of digitization at the strategic level, even if it is crucial to succeed in moving the whole theater in this innovative direction. Digitization, indeed, must be seen crosswise, so that it involves all aspects of a theater's life in order to make the technological efforts more effective.

On average, then, the dimension with the most positive results is those of personnel, with a value of 47,7 followed immediately by administrative activities, which also show excellent signs of about 44,4.

The results in personnel indicate the emphasis theaters place on having digital skills within the organization, which are critical to staying competitive.

Administrative activities, on the other hand, show that a digital management of activities brings many benefits in terms of speed of execution of operations, flexibility and efficiency also for theaters. In addition, the wide availability of digital tools for managing back-office activities and their ease of implementation justify the investments that have to be made to adopt them, which further increases their diffusion.

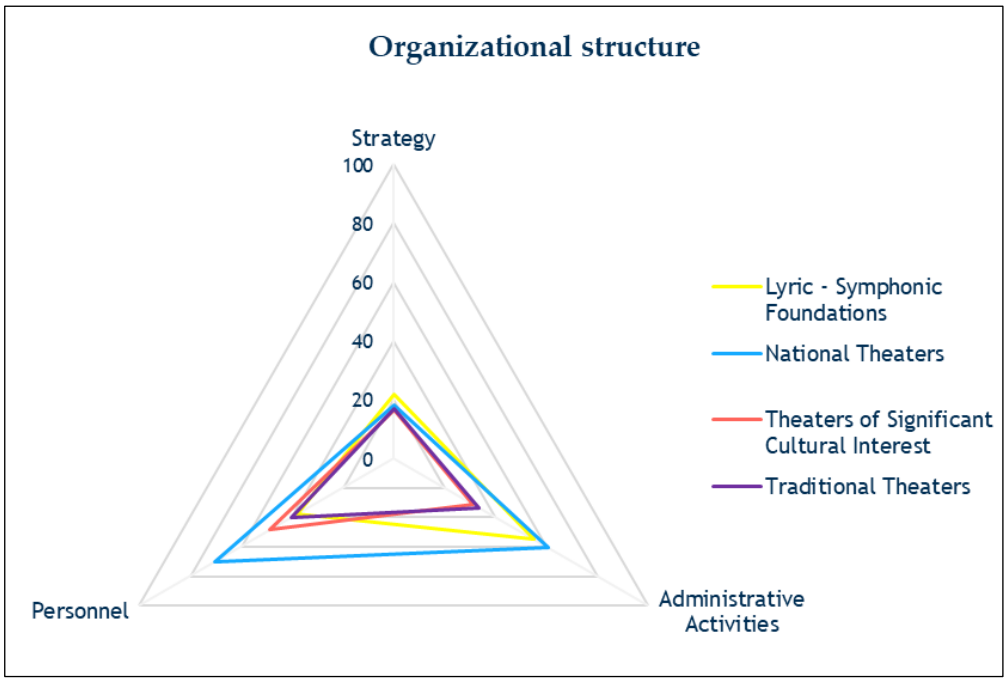


Figure 4.39 - Radar chart, Organizational structure digital maturity by theaters' category

As can be seen in the radar chart, National Theaters are the most digitally advanced in almost all of these dimensions, with the exception of strategy, where, however, they are still well positioned compared to the other categories.

Interesting and peculiar compared to the other categories is personnel, where National Theaters show a significantly higher than average percentage of digitization. This may be due to the fact that among the requirements for receiving grants as National Theaters, significant weight is given to sustaining the quality of artistic staff. Although this does not explicitly refer to digital

resources, it could still be an added incentive to increase staff with cutting-edge technical skills.

It is then also interesting to assess overall whether the specific indicators measuring the dimensions that make up the organizational structure are satisfactory and therefore meet a minimum level of digitization.

In the histogram of Figure 4.40 then, we can see, for each KPI, the percentage of theaters that has an unsatisfactory result, the percentage of theaters that meet the must-have criterion, i.e., that has a basic and necessary level of digitization, and the percentage of theaters that is at an advanced level of digitization compared to competitors.

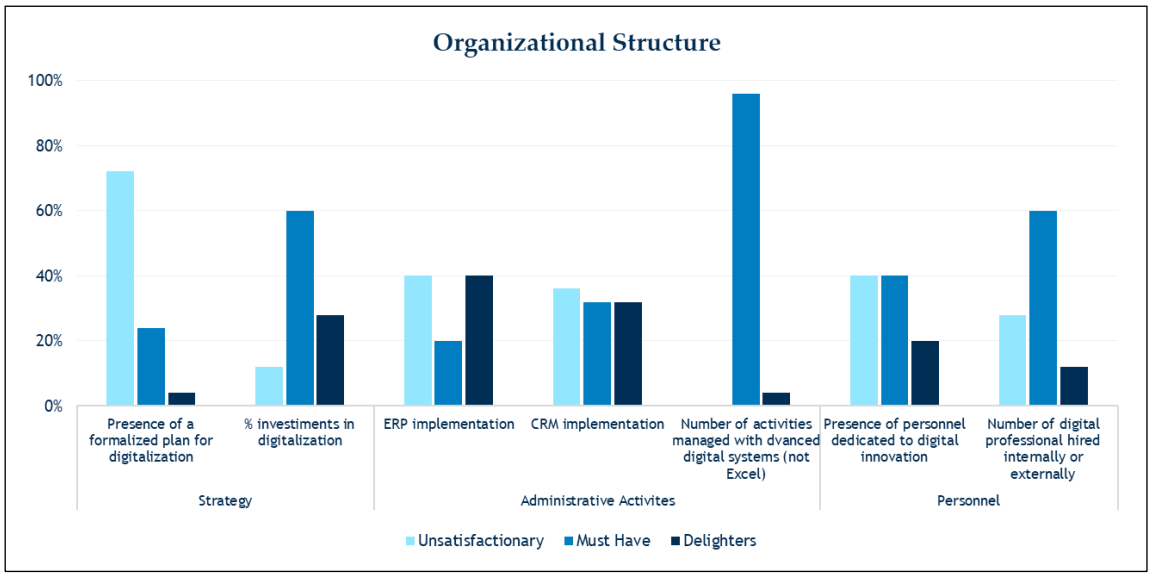


Figure 4.40 - Must Have and Delighters criteria distribution, Organizational Structure

It is immediately visible that the most critical aspect is the presence of a digitized plan. In fact, more than 70 percent of theaters in this case do not meet even the minimum criteria by not having it at all, while only 24 percent have a plan within another document.

On the other hand, the area where all theaters (96 percent) have a sufficient level of digitization is the management of activities through advanced digital tools. The remaining 4 percent then have an even advanced level and position themselves ahead of their competitors.

Also interesting is the case of CRM, where about one-third of the theaters do not meet the minimum criteria, one-third are at the must-have level, and the

remaining one third rank among the delighters. This shows that although the technology is still evenly spread, it is possible to assume that all theaters are moving in this direction.

4.2.2 Core Activities dimension

Regarding the Core Activities dimension, as observable from Table 4.13, the most impactful dimension is online streaming. In fact, this pillar scored, on average, about 73 out of 100, significantly higher than all other dimensions. Certainly, as mentioned several times in this paper, this positive result was influenced by the pandemic, and all theaters recognized its value. Top performers are, the Lyrical Symphonic Foundations, which total a value higher than 91 and the Traditional Theaters, which also total a higher than average value of 74,3.

Category	Logistic	Online Streaming	Artistic Production	Marketing	Ticketing	Onsite	Core Activities Index
Lyric - Symphonic Foundations	34,6	91,4	50,0	63,2	39,6	46,4	56,3
National Theaters	38,0	54,0	70,0	74,3	31,4	54,2	53,6
Theaters of Significant Cultural Interest	13,3	65,0	20,8	55,2	18,7	56,9	39,9
Traditional Theaters	14,3	74,3	14,3	50,0	26,6	28,6	37,8
Total	**24,5**	**72,8**	**37,0**	**59,8**	**29,3**	**45,5**	**46,6**

Table 4.13 - Core Activities index assessment

The dimension of technologies adopted onsite is then the third most cared for, on average, by theaters with a value of 45,5. This is also the only dimension where theaters of significant cultural interest rank first. This is probably due to the very nature of these theaters, which carry out theatrical production activities of relevant cultural interest predominantly within their home region and must necessarily take care of the functionality and characteristics of their theater venues, as we can read on July 1, 2024 decree of the Ministry of Performing Arts.

Then, it is quite strange that ticketing scores so low. In fact, while logistics could be organized more digitally, to increase its efficiency and simplify its

management, but has no direct effect on the end customer, more efficient ticketing management could instead bring concrete benefits directly perceived by users.

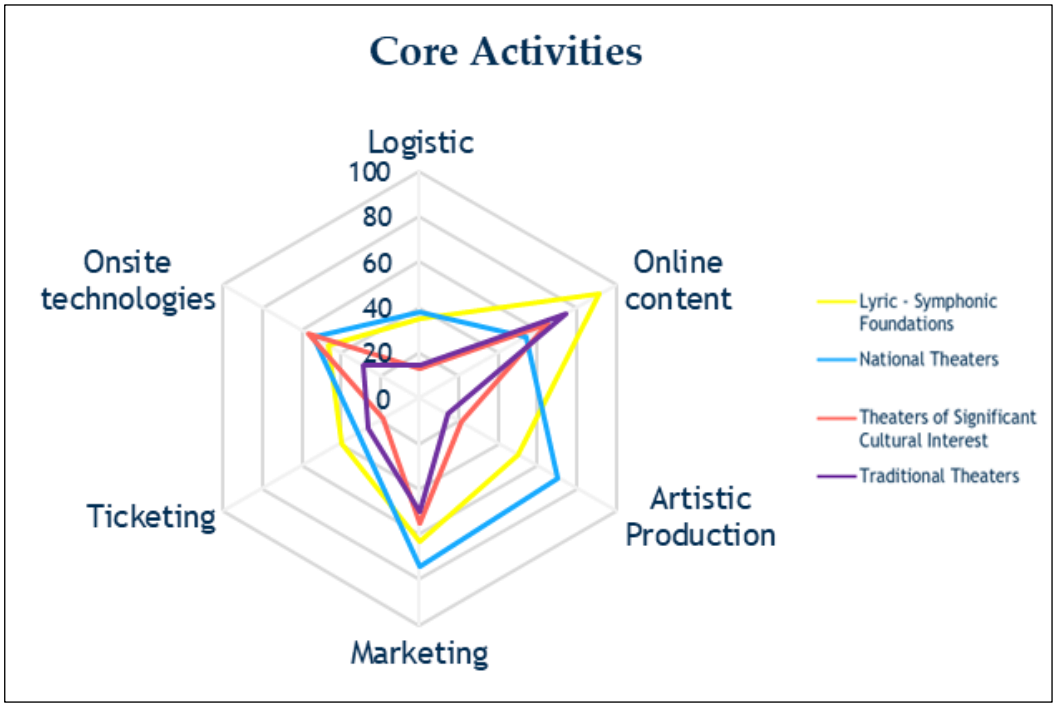


Figure 4.41 - Radar chart, Core Activities digital maturity by theaters' category

In general, as in the case of organizational structure, we can see that the best positioned theaters are the lyrical symphonic foundations and the national theaters.

Indeed, it is those categories of theaters that show the most wide-ranging adoption of digitization, ranking first in almost all sub-dimensions.

Also in core activities, it is interesting to see in percentages how many theaters rank among the delighters, how many among the must-have levels, and how many among the unsatisfactory, for each indicator.

Obviously, as we have already mentioned, the situation here is better than in the case of organizational structure, given the greater effort of theaters in these activities. Most positive, but not surprising, is the fact that more than 90 percent of the theaters are at the delighter level in terms of having a website and none in this category have an unsatisfactory level.

In general, however, in almost all categories the theaters meet the minimum criteria.

The most critical aspect is the presence of warehouse material tracking systems, where almost 70% of theaters do not meet the minimum criteria, and this shows the important change and efforts that can still be made in logistics management.

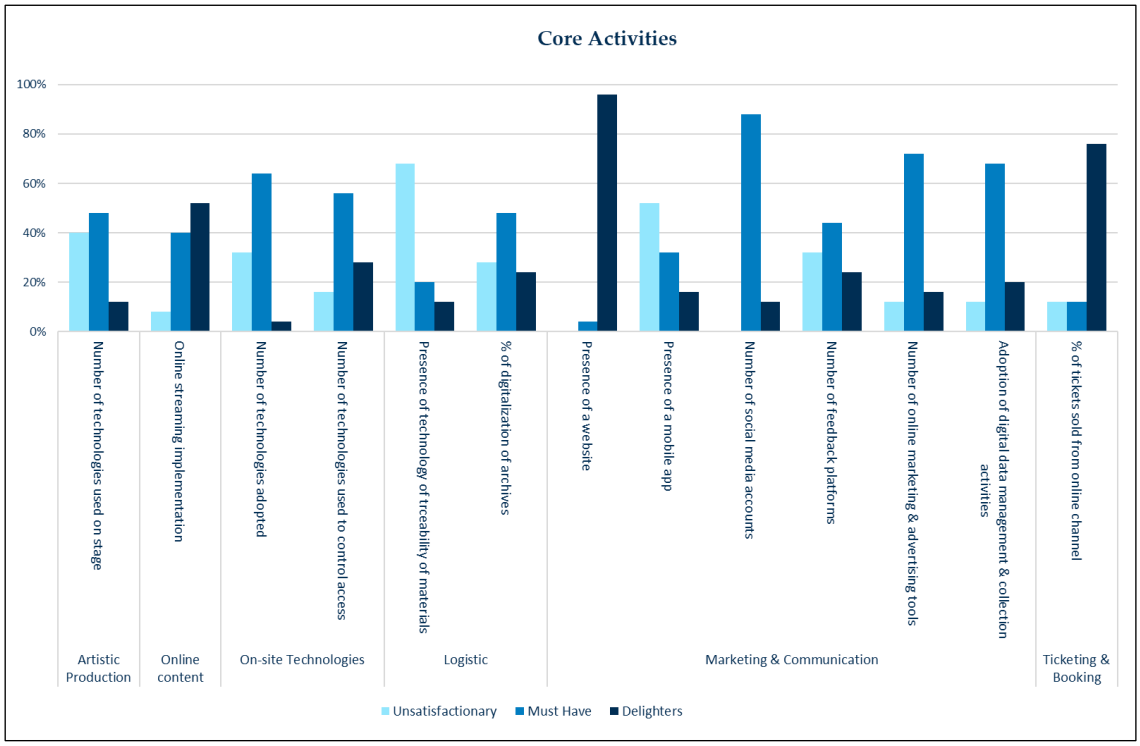


Figure 4.42 - Must Have and Delighters criteria distribution, Core Activities

4.3 Theaters Digital Maturity Assessment

After that, once the values of the two macro dimensions Organizational structure and Core activities were identified, it was then possible to calculate the value of the Theater Digital Maturity index.

The final value, indeed, is given by the weighted average of these two values as in the formula below:

$$\boldsymbol{Thetaer\ Digital\ Maturity}\ (\boldsymbol{TDM}) = 50\% \times Organizational\ Structure_{index} + 50\% \times Characteristic\ Activities_{index}$$

After calculating the values of organizational structure and core activities, it was interesting to estimate how much, on average, theaters in Italy are digitized, and

also how much is the value for each of the FUS categories, but even more interesting is to see how they are positioned with respect to these two macro variables.

In Table 4.14 we see the values of the theater digital maturity index obtained.

Theaters	Organizational Structure	Core Activities	TDM
Lyric - Symphonic Foundations	38,2	56,3	**47,2**
National Theaters	49,7	53,6	**51,6**
Theaters of Significant Cultural Interest	32,2	39,9	**36,0**
Traditional Theaters	30,4	37,8	**34,1**
Total	**36,8**	**46,6**	**41,7**

Table 4.14 - Dimensions and Digital Maturity level final values

The most well positioned theaters, as we can see in Table 4.14 are the National Theaters with a value of 51,6, of course because of the great results they have in particular in Organizational Structure dimension.

Immediately after, with 47,2, we can find the Lyric Symphonic Foundations thanks to the great and positive impact of the Core Activities index in which they are the top performers.

In general, as we can see from the table, all theaters are more digitalized in core activities rather than in organizational structure and this shows a pragmatic approach to digitization, but that lacks a complete digital strategic vision.

In general, the average value of the Theater Digital Maturity index is 41,7.

4.3.1 Factors influencing TDM

The computation of all the KPIs and dimensions of the model which have brought to the final results of digital maturity highlighted the possible presence of correlations between the scores obtained by theaters and their peculiarities. In particular, the Analysis of Variance conducted in order to find such correlations has been useful for three main findings:

- Outliers: two theaters within the sample have been assessed as outlier since their behavior is different from the trend that all the other theaters

have in common. The first one because of a very low level of digitalization in both the dimensions of the model, the second related to an inverse correlation between the two dimensions.

- Existence of a correlation between the Digital Maturity and the level of revenues from ticketing (2019 [7]).
- Influence of the structural dimension index on the activities' one.
- Absence of a statistically significant impact of the FUS category on the level of digitalization even if on average, as seen above, some categories perform better than others.

4.3.1.1 Revenues impact on TDM

After having verified the three hypotheses of the ANOVA One way, the statistical analysis allowed to understand the relationship between the revenues measured in 2019 and the Digital Maturity level. The table below summarizes the main statistical indexes obtained from the analysis.

p-Value	R-sq	R-sq (adj)
0,023	52,59%	36,39%

Table 4.15 - Anova one way, Ticketing revenues and TDM

Thus, it has been possible to conclude that the factor evaluated (i.e., Revenues) has an impact on the response variable (i.e., TDM) being the p-value lower than the alfa-level set for the analysis (0,1). For what concerns the percentage of variability of the model explained by the factor, it is equal to the 36,39 % which is not a high value as expected since the remaining part of the variability is mainly explained by the different indicators composing the index, but it is enough to accept the significance of the analysis.

More in depth, on average, theaters which had revenues higher than 1 million € in 2019 were able to reach a digital maturity level higher than the mean of the total sample, differently from institutions belonging to lower revenues' ranges.

[7] Not affected by the pandemic

4.3.1.2 Core Activities vs Organizational Structure

Another interesting finding as mentioned above is related to the Analysis comparing the structural dimension of the model and the core activities' level of digitalization. The results obtained underlined as theaters having the highest levels of digitalization of the structure also have great performance in digitizing their core activities.

This finding strengthens the concept about the necessity of a top-down approach in digitalization as all theaters which have a structured organization in terms of digitalization are more resilient and mature in the implementation and integration of technologies in all the other activities. Obviously, this does not mean that theaters without a digitized structure cannot implement technologies for simplifying and improving their core business and the customer satisfaction, but it surely facilitates the process.

p-Value	R-sq	R-sq (adj)
0,090	99,06 %	89,07 %

Table 4.16 - Statistical indexes, Core Activities and Organizational Structure relation

Briefly looking at the statistical output, assuming a risk level of not respecting the output of the statistical analysis equal to 10 %, it is worthwhile to observe the very high values assumed by the R-squared parameters which allow to conclude that the structural index explains about the 90 percent of the variability of the system.

4.3.2 Cluster Analysis

After having performed the cluster analysis following the statistical methodology briefly explained in Chapter 3, it has been possible to group the different theaters using as variables to define the similarity level the 2 dimensions of the model, i.e., Organizational Structure and Core Activities.

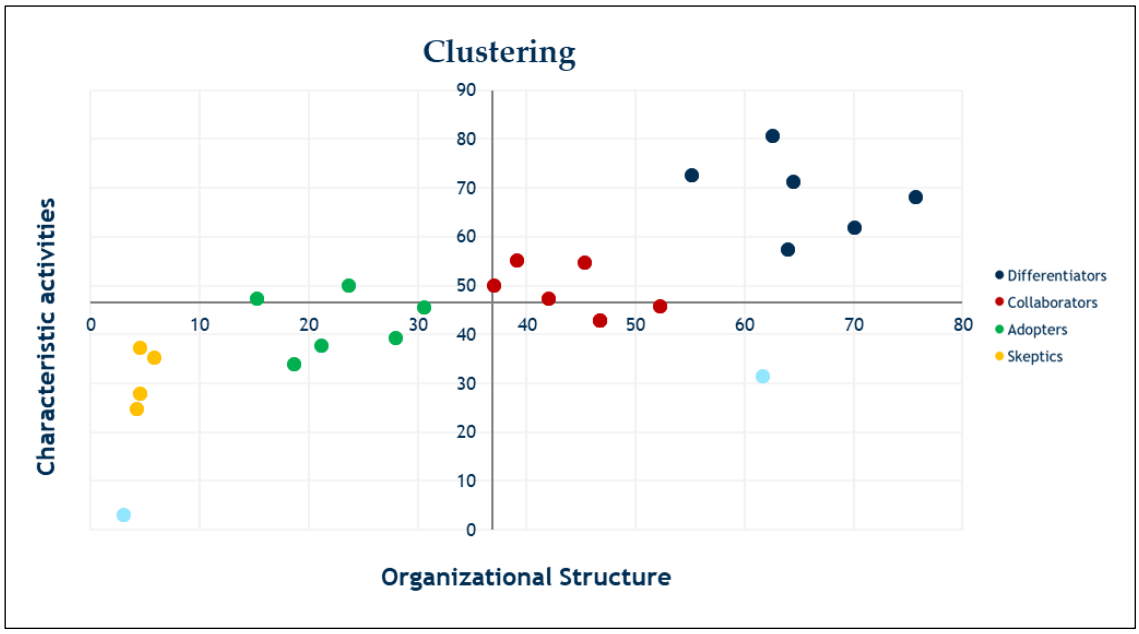


Figure 4.43 - Cluster Analysis

Looking at the dispersion chart of Figure 4.43, in which the axes represent the sample mean of the two dimensions, it is possible to identify 4 main clusters highlighted by the different colors of the points. The two light blue points represent theaters highlighted as outliers from the statistical point of view as they have a different behavior compared to the other clusters. Indeed, one of them has achieved very low performances in both the dimensions of the model while the other is the only one theater of the sample showing an Organizational Structure index much higher than the Activity index.

As a consequence, the cluster analysis performed using the centroid linkage method with Euclidean distances, has resulted into six clusters with a similarity level equal to 86,454. For seek of simplicity, having the purpose to classify theaters of the sample according to the 4 categories suggested in "The digital maturity model 4.0" (Gill & VanBoskirk, 2016), also the outliers will be assigned to one of the four main clusters.

So, with reference to the dispersion graph, the classification has been performed as follow:

- Blue points represent the theaters identified as differentiators, having high Digital Maturity levels as a consequence of their good performance in both the main dimensions
- Red points and the outlier of the 2nd quadrant have been assigned to the collaborators cluster
- Green points represent the adopters as their level of digitalization in terms of structure is below the average even if they have good performance in terms of activities' digitalization
- Orange points and the second outlier have been classified as skeptics.

4.3.2.1 Differentiators

This cluster, as introduced above, is characterized by those theaters which are top performers of the sample in terms of digital maturity having a great positioning both in terms of Organizational Structure and Core Activities as confirmed by the table below.

Differentiators	Organizational Structure	Characteristic Activities	TDM
Average score	**65,3**	**68,8**	**67,0**

Table 4.17 - Differentiators. Model dimensions and Digital Maturity level

It is worthwhile considering, then, the FUS category and the level of revenue of the theaters belonging to the differentiators cluster.

For what concerns the first factor, the group is characterized by 2 National Theaters (33,33 %), 3 Lyric Symphonic Foundations (50 %) and 1 Traditional Theater (16,67 %) which was expected if observing all the considerations done in the previous sections of the chapter.

The second peculiarity, then, regards the fact that, considering the ticketing revenues of 2019, all the theaters belonging to the cluster have had revenues coming from their core activity higher than one million €. This confirms what already observed previously in the section 4.3.1.1 that theaters with better market positioning are able to reach higher digitalization levels.

The two radar charts at Figure 4.44 represent the average positioning of differentiators for each digitization area of the model respectively for the Organizational dimension and the Core Activities one. Accordingly, it is possible to observe that strategy gives the lowest contribute within the structural dimension and ticketing is the less digitalized area concerning the core activities index. These two areas represent the ones in which theaters belonging to such cluster should invest more in order to achieve a delighting performance under every attribute.

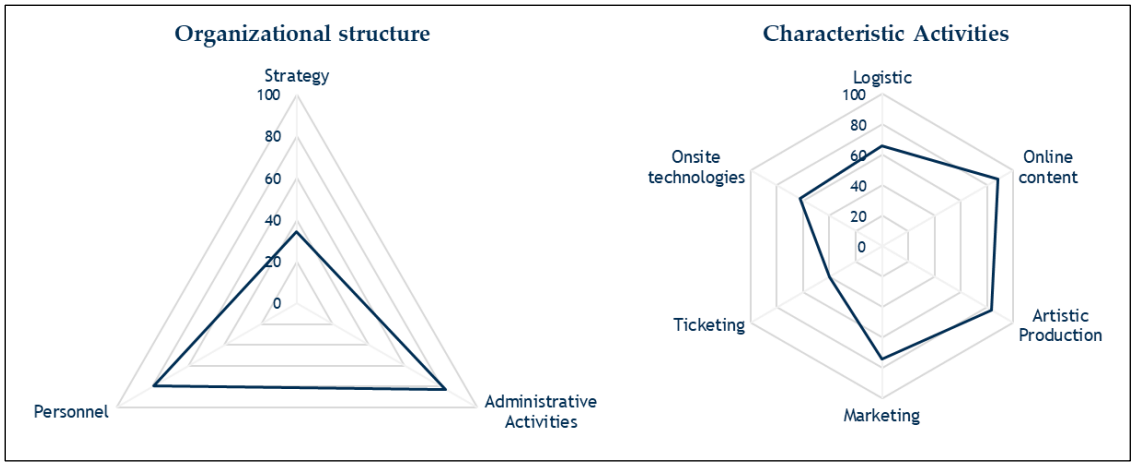


Figure 4.44 - Differentiators digital maturity level by digitalization area

4.3.2.2 Collaborators

Theaters classified as collaborators are characterized by a value of TDM higher than the mean of the sample. In particular, their performances both in terms of strategic digitalization and implementation of technologies to enhance core activities are quite high but their scores are lower than the ones of differentiators.

Collaborators	Organizational Structure	Characteristic Activities	TDM
Average score	**46,3**	**46,3**	**46,3**

Table 4.18 - Collaborators. Model dimensions and Digital Maturity level

Differently from differentiators, this group of theaters is more heterogeneous both in terms of FUS categories and ticketing revenues even if, for what concerns the second factor, 6 out of 8 theaters obtained in 2019 more than 1 million €.

It is worthwhile to observe that, in terms of Organizational structure the least improved area is the strategic one, as expected from the general trend already

confirmed by differentiators while personnel seem to be very digitalized also for this group of theaters.

Logistic instead appeared to be the area of activities with the lowest level of digitalization thus having more margin of improvement and requiring higher investments. As can be appreciated from Figure 4.45, Online contents, Marketing and Onsite technologies give the major contribute to the activities index.

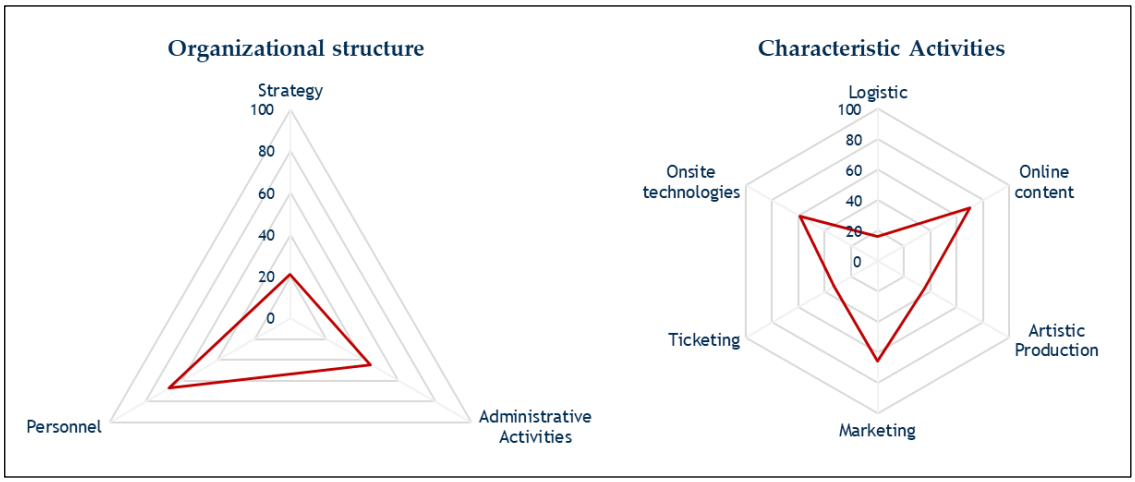


Figure 4.45 - Collaborators digital maturity level by digitalization area

4.3.2.3 Adopters

As numerically explained in the table, Adopters main lacking dimension is represented by the strategic part. As a consequence, even if their average performance in terms of activities is close to the one of Collaborators, all theaters belonging to this cluster has an organizational structure index score lower than the mean of the sample.

Adopters	Organizational Structure	Characteristic Activities	TDM
Average score	**22,8**	**42,4**	**32,6**

Table 4.19 - Adopters. Model dimensions and Digital Maturity level

The main reason behind this lower level of digitalization is related to the strategic part as shown by the radar chart. Within the cluster, no theaters have a formalized dedicated plan for digitalization neither within another document. This is the first cause of the very low level of digitalization (about 13 %) of their

structural dimension. Also, in terms of personnel dedicated to digitalization, adopters appeared to be less developed than the other clusters above described.

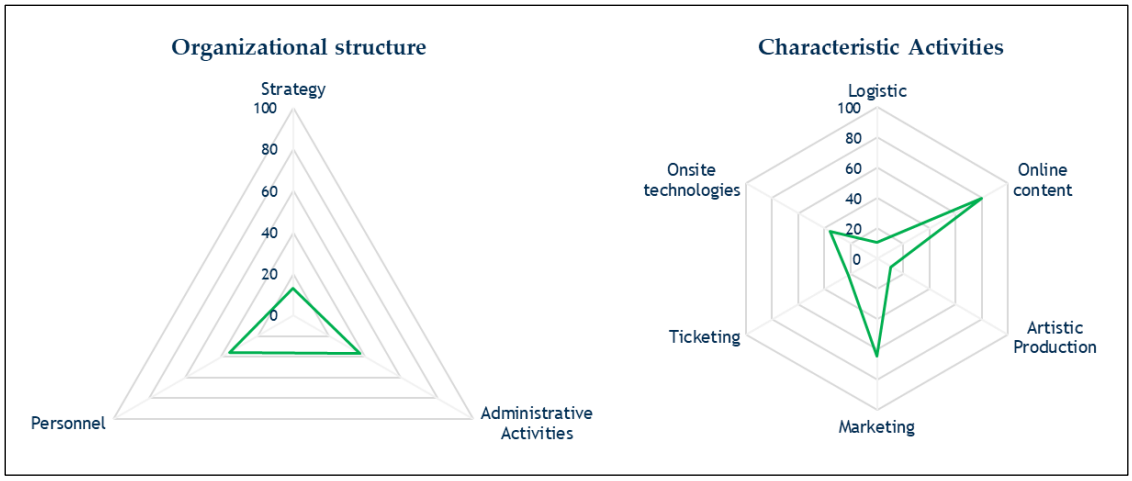


Figure 4.46 - Adopters digital maturity level by digitalization area

4.3.2.4 Skeptics

This final cluster is represented by the low performers of the sample which are in this positioning mainly because they have low investments levels in digitalization.

Skeptics	Organizational Structure	Characteristic Activities	TDM
Average score	**4,4**	**25,7**	**15,1**

Table 4.20 - Skeptics. Model dimensions and Digital Maturity level

After having noticed the much lower scores under each index, it is interesting to catch from the radar chart the digitalization level assessed for each area. The structural part achieved very low values of digitalization in particular concerning the personnel: no theaters have personnel dedicated to digitalization neither involving external consultants. This negative performance is also associated to low digital maturity both in the strategic and administrative area (respectively 4 and 9,6 out of 100).

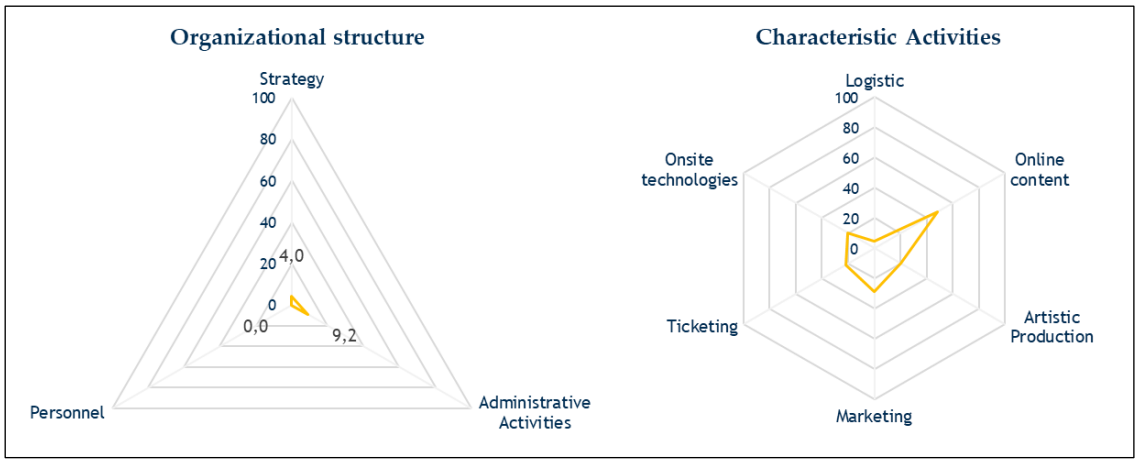


Figure 4.47 - Skeptics digital maturity level by digitalization area

Finally, from the activities side, apart from online content category the other operations have similar levels of technology implementation but theaters belonging to such cluster should invest more also in this dimension in order to achieve a competitive positioning.

Conclusion

This chapter aims to present the main findings and relevant considerations resulting from the Master thesis.

In the first part we will go on to answer the research questions posed at the beginning by presenting our findings.

After that we will highlight the main limitations of our research, but also its many strengths, including the academic contributions and practical benefits that the application of our work can bring to both theater managers and institutions.

Finally, we will highlight what we think might be interesting insights for future research.

Findings

The purpose of this Master Thesis was to build a model that would measure the level of digitization in Italian Theaters.

More specifically, as reported in the Literature Review chapter, this work answers three main research questions:

- RQ1_ Which are the digital transformation dimensions in theaters?
- RQ2_ How is it possible to assess each of these digital transformation measures identified?
- RQ3_ How is it possible to synthetize all these dimensions into a single index?

Therefore, after having analyzed the state of the art in order to identify the relevant digitalization area to be included, in parallel with the design of the survey, it was developed a model shown in the tree represented in the next page, which is configured on three main levels.

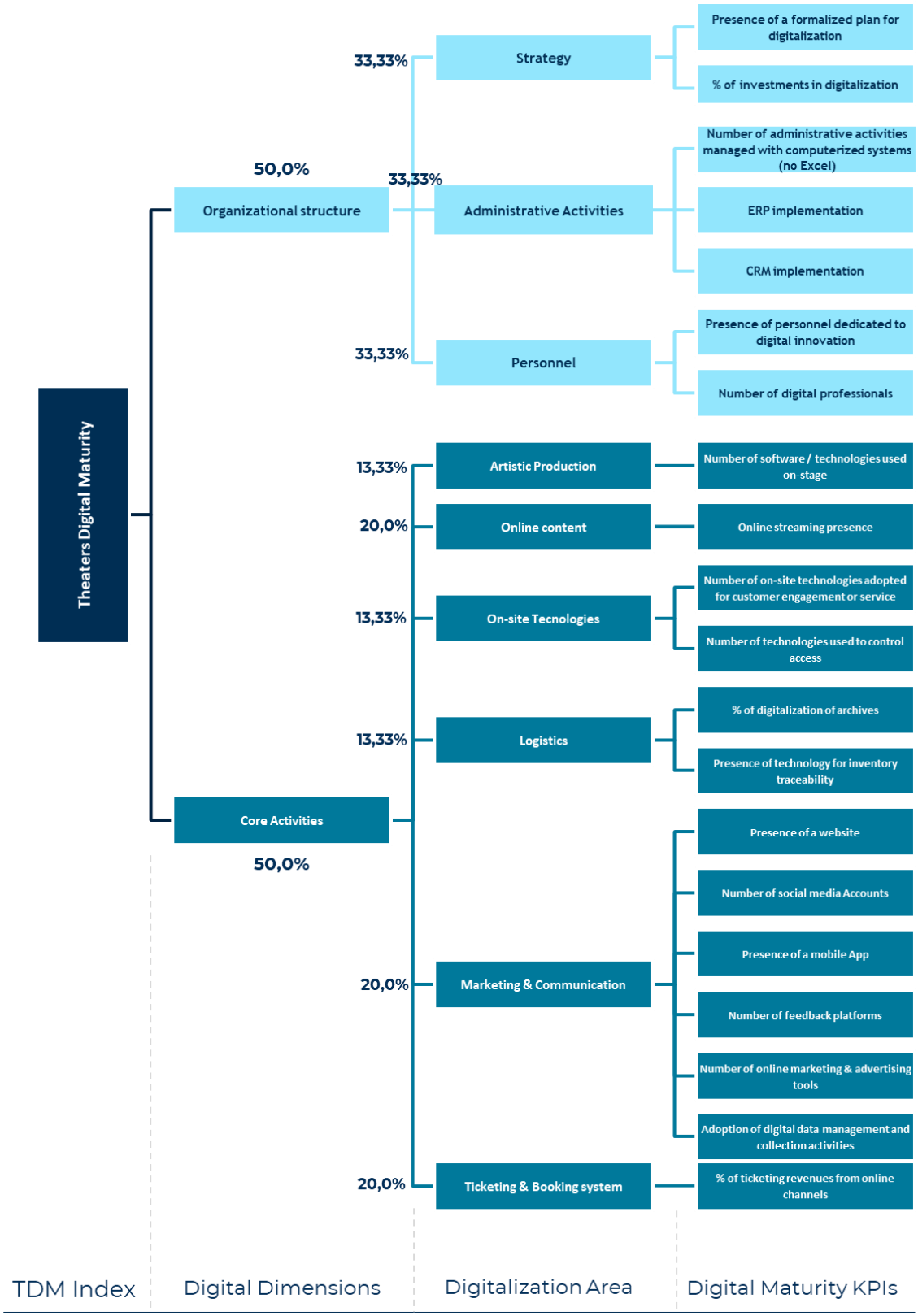


Figure VIII - Theaters Digital Maturity Model

First, the model is constructed by considering the relevant dimensions to be investigated to assess the level of digitization. We defined two macro-dimensions:

- Organizational Structure
- Core Activities, which encapsulate all the main activities that need to be taken into account and represent the core of theater value chain.

Subsequently, these dimensions have been furtherly investigated and deployed around the concept of digitalization, through the identification of the different subdimensions, i.e., digitalization area.

In terms of Organizational Structure, it is possible to distinguish:

- Strategy, which outlines the plan of action to achieve the organization's vision and set digital goals and guides decision-making processes to improve the company's competitiveness in a digitized environment.
- Personnel, which represents the digital skills and competences available within the organization.
- Administrative Activities, which refers to the management of administrative activities in a digitized way.

For the Core Activities, the following area have been assessed:

- Logistics, which represents all the digitized internal activities for the management of archives and warehouses, as well as the handling of instruments and costumes needed for staging.
- Marketing & Communication, which refers to all activities related to customer interaction and the advertising of the institution and the theater season in a digitized environment.
- Ticketing & Booking, which refers to the activities aimed to understand the purchasing behaviors of the audiences and define the sales strategy accordingly to have effective systems in place.
- Artistic Production, which basically refers to the possibility of having a more and more digitized construction and staging of the show.
- On site interaction and engagement, which is related to the availability of new digital solutions on site to enrich the customer experience

- Online customer engagement, which refers to the presence of ad hoc online tools to facilitate and better enhance the customer journey of the clients.

Each dimension was identified based on the literature study, and to ensure that all relevant aspects had been taken into account, two interviews were also conducted, respectively with the Director of Communication and Marketing of the Piccolo Teatro di Milano - Teatro d'Europa- and the General Manager of Fondazione Teatro La Fenice di Venezia.

In order to be able to measure these dimensions, one or more KPIs were identified for each of the abovementioned area, so as to be able to quantitatively assess the digital maturity level performance at each level. These dimensions and KPIs go, at least theoretically, to cover all the relevant aspects to be studied and thus make the model a reference framework for the Italian context.

To each element at the different levels of the model it was attributed a weight in order to compute the final index as a weighted sum of all the relevant digital metrics. To have a reference in defining the weights of the indicators and dimensions, an interview was conducted with the General Director of DG-S (Direzione Generale dello Spettacolo) of Italian Ministry of Cultural Heritage. This allowed us to get an opinion from an expert in the field, but not directly involved in an individual theater, so it allowed us to find the most relevant aspects without affecting the results.

The model was then applied to Italian theaters that fall into the categories that receive contributions from the Single Fund for Performing Arts, according to the ministerial decree issued on July 27, 2017 by the Ministry of Cultural Heritage and Activities and Tourism regarding "Criteria and modalities for the disbursement, advancement and liquidation of contributions to live entertainment, under the Single Fund for Performing Arts referred to in Law No. 163 of April 30, 1985." Specifically, the four categories considered are:

- National Theaters
- Theaters of Significant Cultural Interest
- Lyric Symphony Foundations
- Traditional Theaters.

To collect the data, a Survey was administered, constructed ad hoc to get the useful information to calculate our digital indicators.

Theaters	Organizational Structure	Core Activities	TDM
Lyric - Symphonic Foundations	38,2	56,3	**47,2**
National Theaters	49,7	53,6	**51,6**
Theaters of Significant Cultural Interest	32,2	39,9	**36,0**
Traditional Theaters	30,4	37,8	**34,1**
Total	**36,8**	**46,6**	**41,7**

Table III – Dimensions Indexes and TDM assessment

What emerged from our analysis, then, is that in general, the average value of the Theater Digital Maturity index in Italy is 41.7 measured on a scale of 100.

However, it is also interesting to see how the FUS categories rank: in particular, the National Theatres are the ones with the highest TDM, equal to 51.6, thanks to the good results obtained in both organizational structure and core activities. These are followed by the Lyric Symphonic Foundations, which total a TDM of 47.2. The Lyric- Symphonic Foundations are the best from the point of view of core activities, with a value of 56.3, while they are somewhat lacking in organizational structure. Next come Theaters of Significant Cultural Interest (36) and Traditional Theaters (34.1).

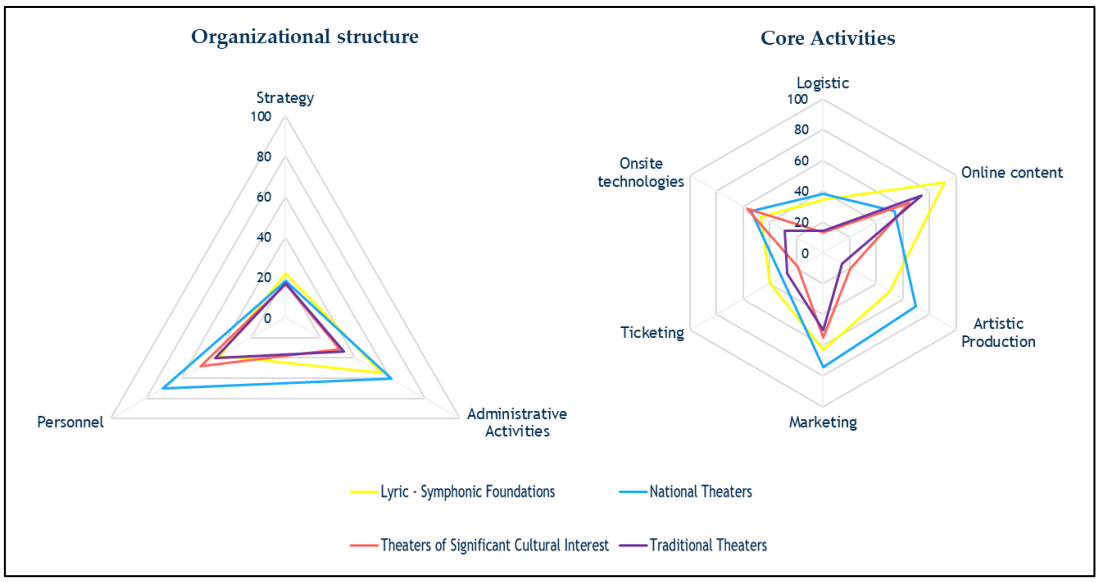


Figure IX – Theater Categories comparison under the model dimensions

After having measured the different indexes related to the model it was possible to statistically analyze the results finding a positive correlation between ticketing revenues of 2019 and the theaters' digital maturity level (TDM).

Moreover, there is also a positive unidirectional correlation between the two dimensions of the model. In particular, theaters with higher digitalization levels of their organizational structure appeared to be more digitalized also in terms of activities. This suggested the strength of having a top-down approach to digitalization where a digital strategy, the presence of digitized competences and the digital management of administrative activities are the basis to implement technologies also in the other core areas of the institution.

The last step of the Digital Maturity assessment is related to the classification of theaters according to the results achieved in the model. For doing that, it was adopted the Statistical Clustering based on Centroid Linkage with Euclidean distance, from which four clusters have been obtained with a similarity level equal to 86,454.

Accordingly, theaters were divided into categories adapted from the "Digital Maturity Model 4.0" (Gill & VanBoskirk, 2016) as represented in the dispersion chart.

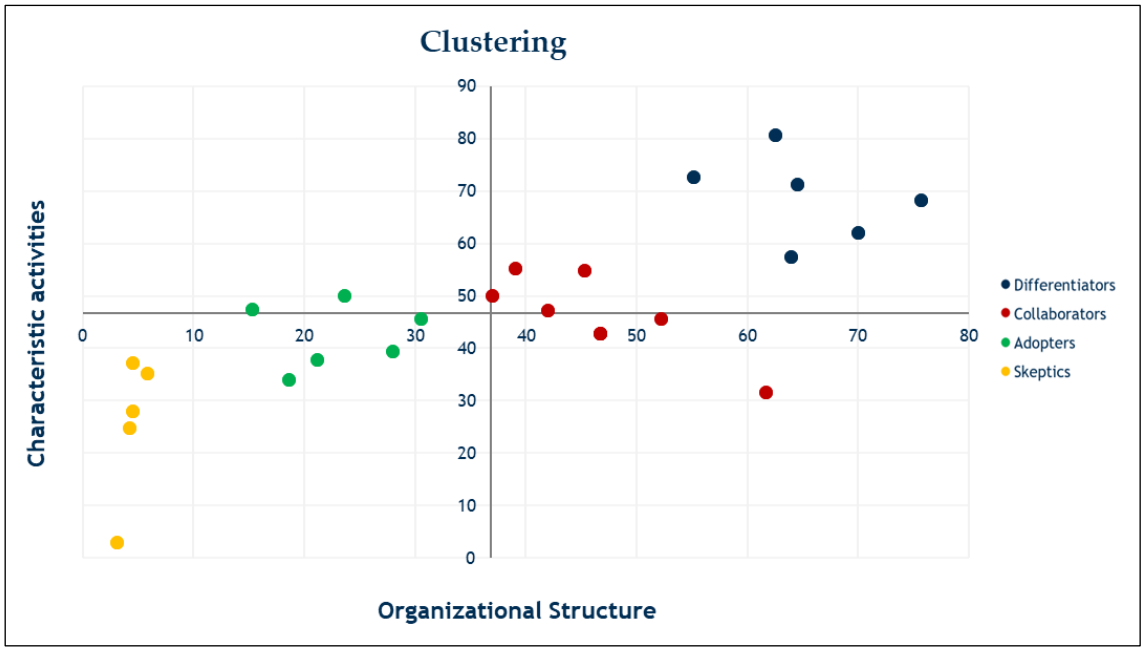


Figure X - Cluster Analysis results

Specifically, classification allowed to identify:

- Differentiators, which have a high level of digitization both in terms of organizational structure and approach to digital business strategy that allows them to integrate digitization into other activities at a high level of implementation. They are, indeed, top performers of the sample in terms of digital maturity having a great positioning both in terms of Organizational Structure and Core Activities.
- Collaborators, who are characterized by a high level of digitalization in terms of organizational structure, but their level of implementation in the main activities for enhancing a better customer experience is lower compared with differentiators. However, they are still characterized by a value of TDM higher than the mean of the sample.
- Adopters, who are in the opposite position compared to collaborators. They have a good score in the core activities' dimensions, but they lack a guideline such as a plan or strategy dedicated to digitization. Therefore, their level of digitalization in terms of structure is below the average even if they have good performance in terms of activities' digitalization.
- Skeptics, who do not believe that digital disruption is important to them are thus characterized by a low level of digital maturity in both the macro dimensions of the model.

The abovementioned characteristics of the different clusters are deepened by the two radar charts represented below which underlined for each cluster the different levels of digital maturity in each area of the model respectively for the organizational dimension and the core activities.

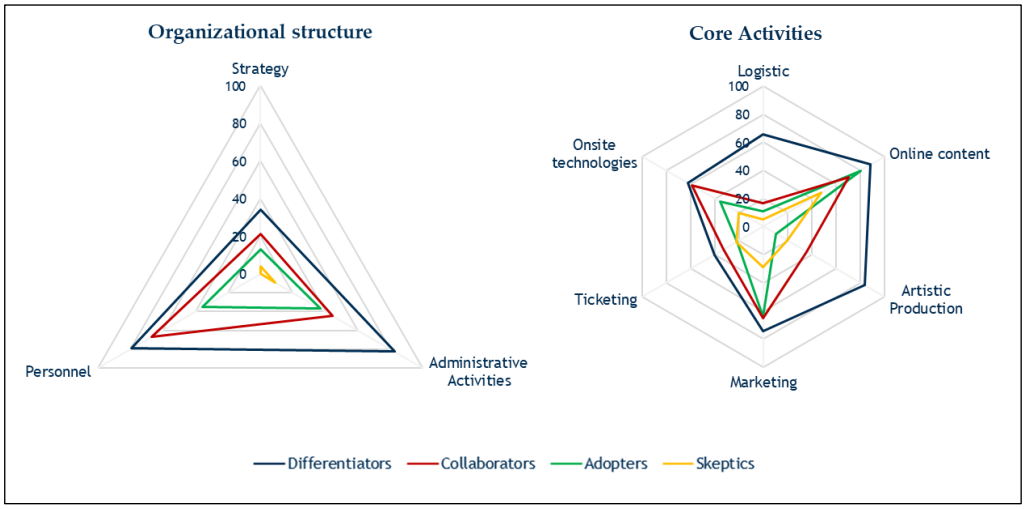


Figure XI - Radar chart comparing the different clusters under each dimension

This chart can be very useful to understand in which area cluster should invest and improve in order to increase their level of digitalization. Specifically, while Differentiators have high levels in each area even if their performances in strategy and ticketing are still low, the other classes of theaters seem shows different trends. In particular, to confirm the reliability of the cluster analysis, it is possible to notice a graduating decrease in each performance passing from Differentiators to Skeptics which determine their positioning according to the digital maturity index.

Limitations

At this point, it is also fair and important to report some limitations of this analytical work, which should be taken into consideration when reading the results.

First, the main limitation of this research is the paucity of the data collected. Although, in fact, about 40 percent of the investigated population responded, the data collected from 25 theaters is still a minimal number to perform more meaningful statistical analyses. Nevertheless, the analysis of variance and statistical clustering performed allowed to achieve significant statistical results. Furthermore, some results, especially the ones related to the ticketing and booking indicators, are affected by the impact of Covid-19 which have drastically worsened theaters' economic position. This is the reason why, in performing the statistical analysis of variance, we have adopted revenues data related to 2019 to avoid any distortion.

Moreover, the choice of sample might be reductive and not totally expository of the Italian landscape. Indeed, relying on the ministerial decree that allocates funds from the Single Fund for Performing Arts excludes from the analysis all those purely private entities, all those smaller municipal and parish realities, and also all those theaters that despite participating in the calls for proposals and perhaps receiving other state funds do not meet the necessary characteristics for the FUS call for proposals.

However, since there is no up-to-date census of Italian theaters that includes all those with a permanent establishment, it is not possible to have a more scientifically valid sample for research. In fact, enlarging the sample would not have allowed, due to lack of knowledge, to include all Italian theaters and this

would have led to a distorted picture of the current situation. Therefore, especially since this is the first time the model has been tested, such a precise and specific choice allows for reliable, reproducible and valid results.

Another limitation of the research was found at the questionnaire administration stage, where many theaters stated that they were unaware of some data necessary to answer, particularly those related to ticketing. This, in most cases, led theaters to stop responding and never finish filling in, thus making the data unusable for our model. On the other hand, however, this great attention on the part of the theaters is positive, as they never responded in a fictitious way, thus making the collected data reliable and truthful.

Finally, further limitation might be the attribution of the weights. From the interview with the General Director of DG-S (Direzione Generale dello Spettacolo) of Italian Ministry of Cultural Heritage, in fact, emerged that some areas are more important than others and therefore were given a higher weight. However, the situation is constantly evolving, so it could be that what is valid today, is no longer valid in a few months. Therefore, it will be necessary, in case of adopting this model in the future, to go and revise the weights of the various variables, considering the technological situation and also taking into account the fact that some technologies that are considered delighter today, might become must-haves in the future and therefore could no longer be so competitive.

Contributions

Despite the abovementioned limits, the model developed, and the conducted research have main points of strengths.

Academic relevance

First of all, it is right to mention the important academic contribution this research is able to provide. Indeed, as we have pointed out in the literature chapter, there are two main gaps in the studies done so far.

Firstly, if on one hand there are few papers that report a complete view of the management of a theater organization, on the other hand there is a complete lack

of research on digitization in theaters at 360°. Indeed, it is possible to find articles or papers that address some very specific technological innovations, such as AR or VR on stage or the ability to deliver shows online, but there is no literature that focuses on digitization in all areas, from the back office to the onsite experience for the customer. Furthermore, there are no research that highlight the benefits of the adoption that some technologies can bring to cultural institutions. Alongside this fragmented and not at all efficient view of digitization in theaters, then, it is not possible to find any model for measuring digital maturity in theaters.

Accordingly, the Master Thesis and the model developed allowed to address these literature gaps identified between the three areas concerning Theater, Digitization, and Performance Measurement:

- Thanks to the analysis of the literature review and the consequent administration of the survey it has been possible to identify the most important digital dimensions within theaters
- The development of the indicators has allowed to define a performance measurement system taking into considerations all the relevant aspects about the performance assessment in cultural institutions from the state of art
- The model development and the results analysis addressed the gap between Theaters, Performance measurement and digitalization through the development of a new Digital Maturity model.

Managerial implications

The model and the related results can be relevant for theaters in order to understand their positioning in terms of digitalization also adopted the model as a benchmarking tool for comparing with the other institutions.

As a consequence, the model could serve as a guideline to identify the improvement area in order to correctly define the investment strategy in digitalization both in a short-term and long-term perspective.

Specifically, the insights coming from the results obtained could be differentiated as follow:

- Theaters clustered as differentiators, since are well positioned, should focus on the area of strategy and ticketing, since they appear to be the less

digitalized and so they should cover these aspects to be competitive at 360°.

- Collaborators theaters, instead, should focus on logistic, which is the area having more margin of improvement and requiring higher investments. Contemporarily, they should invest more in their strategic dimension in order to be able to reach the upper right part of the positioning map.
- Skeptics and Adopters should probably start focusing on personnel, where both are severely lacking. Personnel, indeed represents one of the most relevant dimensions, as investing in digital resources and skills certainly pushes more forcefully and effectively toward greater digitization throughout the theater.

In general, it is also possible to say that managers should all focus more on the strategic area adopting a top-down approach as demonstrated by the analysis. Understanding the importance of digitalization since the draft of the strategic plan is crucial for being competitive and fully digitalized and all theaters seems now rather scarce in this field.

In addition to that, the adoption of this model from the theater side has numerous other benefits, such as the possibility of benchmarking with other theater or the possibility to use its quantitative results as a positive signal to receive funds and grants based precisely on the theater's ongoing technological progress and/or based on the future plan.

Finally, being the model developed after the pandemic, it could be useful also to understand how institutions have reacted to such a disruption consequently measuring their degree of resilience.

Other Relevant Benefits

Together with the academic and managerial relevance, the research can be very useful at the ministerial and governmental level. The quantitative results of its application could be used as a criterion of choice for the distribution of public funds, but also to understand which are the best strategies toward future innovation trend within the cultural sector.

It is also useful, then, to have a comparison with other countries, in order to be able to adopt government plans that, by being an incentive to continue on the

path of innovation, will enable the culture sector, which is so important in Italy, to remain globally competitive. In this regard, for example, the National Recovery and Resilience Plan (PNRR) envisages the allocation of a considerable fund for the development of projects to increase, organize, integrate and preserve the digital heritage of archives, libraries, museums and places of culture; offer citizens and operators new ways of fruition; and develop a cloud and software infrastructure for the management of digital resources.

Finally, another big strength of this model lies in its simplicity and intuitiveness, which makes it easy to understand, both to apply it and to critically read its results, and to adapt it in case of changes in the characteristics of the theaters or, even in case of adoption abroad. In fact, although this model was designed and built specifically on the typical organizational structures of Italian theaters, it can easily be readapted to have an international application.

Future research

In conclusion, the model applied to the Italian scene, and particularly to FUS theaters, proposes a valid and truthful picture of the Italian cultural situation.

Very interesting, for the future, given the almost identical characteristics of the theaters in Italy and given that the model was built precisely based on this structure, would be to expand the analysis to all theaters in Italy so as to have an even more complete picture. After that, surely comparing the results obtained for theaters in the FUS categories and the others will allow us to identify the main differences and assess if and how public funds contribute to the digital development of institutions.

Also, as we have already pointed out, applying the model to a larger sample will allow for very meaningful statistical analysis to go and see the direct correlations between variables and what immediately impacts digital development.

Finally, broadening the analysis to the international context can also make numerous contributions both academically and politically. Indeed, a comparison of states in the cultural world, especially in the European Union, could be useful to understand in which direction to move and what benefits can be drawn from the strategies and visions of other countries as well.

Appendix

A. Questionnaire

Questionario digitalizzazione Teatri 2021-2022

A partire da quest'anno l'**Osservatorio Innovazione Digitale nei Beni e Attività Culturali** della School of Management del **Politecnico di Milano** analizza il livello di diffusione dell'**innovazione digitale all'interno dei teatri italiani attraverso un'indagine** cui la invitiamo a partecipare.
La compilazione del questionario richiederà circa 20 minuti.
Nel caso in cui dovesse ritenere di non essere la figura più appropriata al completamento dell'indagine la preghiamo di inoltrare l'email al referente che potrà provvedere alla compilazione.
I dati saranno utilizzati esclusivamente in forma aggregata ed anonima a scopo statistico e verranno inviati **a tutti i rispondenti** dopo essere stati **presentati** in occasione del Convegno che l'Osservatorio terrà a Milano il 7 giugno 2022**.**
Cliccando su "Inizia il questionario" esprime il consenso al trattamento dei suoi dati da parte dell'Osservatorio per l'invio di survey con finalità di Ricerca e dichiara di aver preso visione dell'Informativa Privacy.
Attraverso il pulsante "Salva" è possibile salvare in ogni momento la compilazione e riprenderla in un momento successivo attraverso il link che verrà inviato via email.
Per qualsiasi dubbio o commento contattare francesca.cruciani@polimi.it

ANAGRAFICA

Q1: Per poterle inviare la Ricerca dell'Osservatorio ed escluderla da eventuali solleciti a compilare la Survey, le chiediamo di compilare la seguente tabella con i suoi dati.

Nome	
Cognome	
Ruolo all'interno dell'istituzione	
E-mail	

Q2: Denominazione del Teatro:

INNOVAZIONE DIGITALE: PIANIFICAZIONE STRATEGICA

Q3: Avete un piano strategico formalizzato per l'innovazione digitale?

- ◯ Sì, esiste un documento dedicato
- ◯ Sì, all'interno di un altro documento (es. piano strategico)
- ◯ No

Note: if you have NOT answered/chosen item [1, 2] in question 3, skip the following question

Q4: Il piano digitale è stato sviluppato come requisito per accedere a fondi di finanziamento?

◯ Si, come requisito per ricevere fondi
◯ No, indipendentemente dalla possibilità di ricevere fondi

Note: if you have NOT answered/chosen item [1, 2] in question 3, skip the following question

Q5: Avete rivisto il piano di innovazione alla luce delle nuove opportunità/necessità emerse a seguito della pandemia?

◯ Si ◯ No, ma prevediamo di farlo ◯ No

Q6: Considerato l'ammontare complessivo degli investimenti annui, indicare la percentuale destinata al digitale (strumenti digitali, personale interno, acquisto servizi esterni) nel biennio 2020-2021:

◯ Nessun investimento in digitale ◯ 1-10% ◯ 11-25%
◯ 26-50% ◯ 51-75% ◯ 76-100%

Note: if you have NOT answered/chosen item [2, 3, 4, 5, 6] in question 6, skip the following question

Q7: Fatto 100 il budget dedicato ad investimenti in tecnologie digitali dal 2020 a oggi, indicate come sono distribuiti

Catalogazione e digitalizzazione degli archivi storici		%
Servizi di supporto alla visita della struttura		%
Servizi di supporto alla fruizione dello spettacolo		%
Servizi di supporto alla fruizione di contenuti online		%
Marketing, Comunicazione e Customer Care		%
Ticketing, gestione prenotazioni e controllo accessi		%
Sicurezza e sorveglianza		%
Attività educative e didattiche		%
Altro		%
	100%	

Q8: Indicare l'attività in cui RITENETE PRIORITARIO INVESTIRE in tecnologie digitali nei prossimi due anni

- ◯ Catalogazione e digitalizzazione degli archivi storici
- ◯ Servizi di supporto alla fruizione di contenuti online
- ◯ Ticketing, gestione prenotazioni e controllo accessi
- ◯ Attività educative e didattiche
- ◯ Altro (specificare)
- ◯ Servizi di supporto alla visita in loco
- ◯ Marketing, Comunicazione e Customer Care
- ◯ Sicurezza e sorveglianza
- ◯ Non investiremo in digitale nei prossimi due anni

If you have chosen "other", please specify:

DIGITALIZZAZIONE ATTIVITA' AMMINISTRATIVE

Q9: Specificare per quali delle seguenti attività avete a disposizione dei sistemi gestionali informatizzati (nonindicare attività gestite tramite programmi del pacchetto Office base) (Più risposte possibili)

- ☐ Contabilità
- ☐ Gestione personale
- ☐ Gestione attività didattiche
- ☐ Reportistica (prenotazioni, profilo visitatori etc)
- ☐ Nessuna delle precedenti
- ☐ Fornitori/acquisti
- ☐ Gestione degli spazi (affitto spazi etc)
- ☐ Gestione di fondi e finanziamenti
- ☐ Programmazione artistica

Note: if you have NOT answered/chosen at least one of the following items: [1, 2, 3, 4, 5, 6, 7, 8] in question 9, skip the following question

Q10: Avete un sistema ERP a supporto della gestione che integri e gestisca in maniera centralizzata le varie funzioni gestionali?

- ◯ Si
- ◯ No
- ◯ No, ma abbiamo in programma di adottarlo

ERP (Enterprise Resource Planning): si riferisce a quei sistemi informatici per la gestione e la pianificazione aziendale capaci di integrare tutti i processi di un'organizzazione: amministrazione, contabilità, approvvigionamento delle risorse, produzione, logistica, acquisti, vendite ecc.

Q11: Utilizzate un software di CRM?

- ◯ Si
- ◯ No
- ◯ No, ma abbiamo in programma di adottarlo

CRM (Customer Relatioship Management): Rappresenta un sistema di gestione di tutti i rapporti e le interazioni di un'azienda che hanno luogo con i clienti potenziali ed esistenti

ESPERIENZA ONLINE

Q12: Avete un sito web proprietario?

- ◯ Sì, relativo solo alla nostra istituzione
- ◯ Sì, in comune con altre istituzioni della nostra rete teatrale
- ◯ Sì, in comune con altre istituzioni culturali (non della rete teatrale)
- ◯ Sì, all'interno di altri siti web (ad esempio, sito web del Comune)
- ◯ No

Q13: Avete un'App?

◯ Si ◯ No ma prevediamo di inserirla ◯ No

Note: if you have NOT answered/chosen item [1] in question 13, skip the following question

Q14: Quali sono le funzionalità presenti nell'app? (Più risposte possibili)

- ☐ Informazioni generali del Teatro (indirizzo, orari, ecc.)
- ☐ Informazioni riguardo ad eventi culturali all'interno del Teatro
- ☐ Prenotazione/acquisto di biglietti e/o altri servizi
- ☐ Servizi di supporto al cliente per altre attività (visite, esperienze, ecc.)
- ☐ Altro (specificare):

If you have chosen "other", please specify:

Q15: Avete un videogioco?

◯ Si ◯ No, ma abbiamo in programma di implementarlo
◯ No

Q16: Avete un Chatbot?

◯ Si ◯ No, ma abbiamo in programma di implementarlo
◯ No

CHATBOT: sistemi che attraverso l'intelligenza artificiale rispondono in automatico alle domande poste dagli utenti secondo schemi preimpostati.

Q17: Quali account social avete? (Più risposte possibili)

- ☐ Facebook
- ☐ Twitter
- ☐ Instagram
- ☐ YouTube
- ☐ Pinterest
- ☐ TikTok
- ☐ Nessuno
- ☐ Altro (specificare)

If you have chosen "other", please specify:

Note: if you have NOT answered/chosen at least one of the following items: [1, 2, 3, 4, 5, 6, 8] in question 17, skip the following question

Q18: Eseguite attività di monitoraggio dei vostri canali social?

- ◯ Sì, tramite strumenti analitici forniti dal social network stesso
- ◯ No
- ◯ Sì, tramite strumenti analitici ad hoc (specificare):

If you have chosen "other", please specify:

Q19: Su quali siti/piattaforme di recensioni siete presenti? (Più risposte possibili)

- ☐ TripAdvisor
- ☐ GoogleMyBusiness
- ☐ Facebook Places
- ☐ Foursquare
- ☐ Nessuno
- ☐ Altro (Specificare)

If you have chosen "other", please specify:

Q20: Eseguite attività di monitoraggio e gestione delle recensioni? (es. recensioni Tripadvisor, Google maps ecc.)

- ◯ Si, leggendo le recensioni e rispondendo dove necessario
- ◯ No
- ◯ Si, con strumenti analitici ad hoc (specificare):

If you have chosen "other", please specify:

Q21: Inviate newsletter di aggiornamento su attività ed eventi?

◯ Sì, email standard
◯ Sì, email personalizzate sulla tipologia di cliente
◯ No

FRUIZIONE DEI CONTENUTI IN LOCO

Q22: Svolgete attività museale o visite guidate alla struttura teatrale ?

◯ Si, sempre
◯ Si, solo su prenotazione
◯ Si, solo per scuole e nell'ambito di progetti educativi
◯ Si, solo per altre categorie di pubblico
◯ No

Q23: Quali tecnologie e servizi sono offerti a visitatori e spettatori?

☐ Wi-Fi ☐ Audioguida ☐ Realtà aumentata ☐ Realtà virtuale
☐ Realtà mista ☐ Beacon ☐ NFC ☐ Video LIS
☐ Touchscreen ☐ 3D Display ☐ Totem interattivi ☐ QR Code
☐ Nessuno

REALTÀ AUMENTATA: arricchimento della percezione sensoriale mediante immagini o informazioni (convogliate elettronicamente) che non sarebbero percepibili attraverso i sensi umani (es. ricostruzione virtuale di un Parco archeologico o di parte di una statua).
REALTÀ VIRTUALE: realtà simulata in cui l'utente èisolato dall'ambiente esterno grazie all'uso di dispositivi come occhiali o un casco di realtà virtuale
REALTÀ MISTA: fusione tra mondo fisico e mondo digitale in cui l'utente può considerare gli oggetti virtuali come fossero davvero esistenti e interagire con essi
BEACON: trasmettitori radio a bassa frequenza che sfruttano la tecnologia Bluetooth Low Energy per monitorare la presenza di dispositivi mobili e trasmettere dati. Possono dialogare con smartphone, tablet e tutti i device mobili dotati di apposita app per la decodifica dei messaggi provenienti dai dispositivi
NFC (Near Field Communication): tecnologia che consente la trasmissione di dati e di file tra due dispositivi che si trovino a pochi centimetri di distanza
VIDEO LIS: Video nella Lingua dei Segni Italiana
QR CODE: codice a barre bidimensionale contenente informazioni generalmente leggibili tramite scansione da smartphone.

TICKETING, GESTIONE PRENOTAZIONI & CONTROLLO ACCESSI

Q24: Quale tipologia di biglietteria è utilizzata nell'istituzione? (Più risposte possibili)

- ☐ Biglietto cartaceo (o scontrino) con contabilizzazione cartacea
- ☐ Biglietto cartaceo con contabilizzazione su sistema elettronico (o banca dati)
- ☐ Biglietto acquistabile online e stampato a casa
- ☐ Biglietto acquistabile online e non stampato (ad esempio, visibile da smartphone)
- ☐ Non è presente un sistema di biglietteria

Q25: Avete un sistema di abbonamento? (Più risposte possibili)

- ☐ Si, abbonamento cartaceo
- ☐ Si, abbonamento tramite card digitale
- ☐ Altro (specificare)
- ☐ Si, abbonamento digitale tramite dispositivo mobile
- ☐ No

If you have chosen "other", please specify:

Note: if you have NOT answered/chosen at least one of the following items: [1, 2, 3, 5] in question 25 AND answered/chosen at least one of the following items: [1, 2, 3, 4] in question 24, skip the following question

Q26: Quale percentuale delle entrate della biglietteria è rappresentata da abbonamenti?

◯ < 10% ◯ 10% - 25% ◯ 26% - 50% ◯ 51 - 75% ◯ > 75%

Note: if you have NOT answered/chosen at least one of the following items: [3, 4] in question 24, skip the following question

Q27: E' possibile selezionare il posto a sedere acquistando i biglietti attraverso canali digitali?

- ◯ Si
- ◯ No, ma abbiamo in programma di implementare questo servizio
- ◯ No

Q28: Fatto 100 i proventi complessivi dell'ente, indicare come sono distribuiti in percentuale
Nota: : Non inserire il simbolo %, ma solo il numero (es. per 50% scrivere 50).

	2019	2020	2021	
Biglietteria				%
Finanziamenti pubblici				%
Finanziamenti privati				%
Servizi accessori				%
Altro				%
	100%	100%	100%	

Note: if you have NOT answered/chosen at least one of the following items: [1, 2, 3, 4] in question 24, skip the following question

Q29: A quanto ammontano i proventi da biglietteria (online e/o fisica) per gli anni solari 2019, 2020 e 2021?

	2019	2020	2021
Meno di 5.000 euro	◯	◯	◯
Da 5.001 a 10.000 euro	◯	◯	◯
Da 10.001 a 20.000 euro	◯	◯	◯
Da 20.001 a 50.000 euro	◯	◯	◯
Da 50.001 a 100.000 euro	◯	◯	◯
Da 100.001 a 500.000 euro	◯	◯	◯
Da 500.001 a 1 milione di euro	◯	◯	◯
Da 1 a 3 milioni di euro	◯	◯	◯
Da 3 a 5 milioni di euro	◯	◯	◯
Oltre 5 milioni di euro	◯	◯	◯

Note: if you have NOT answered/chosen at least one of the following items: [1, 2, 3, 4] in question 24, skip the following question

Q30: Fatto 100 le entrate da biglietteria (sia ingressi singoli che abbonamenti) indicare la distribuzione percentuale per canale per l'anno 2021.
Nota: Non inserire il simbolo %, ma solo il numero (es. 50% scrivere 50)

Canali di vendita	% di entrate	
Biglietteria in loco		%
Altri canali fisici (es. agenzie di viaggio, tour operator, uffici turistici, hotel)		%
Sito web o app proprietari del teatro		%
Altri siti web online o app non proprietari (es. sito web del concessionario o tour operator online)		%

Altro		%
	100%	

Q31: Utilizzate un Channel Manager?

◯ Si ◯ No

Channel Manager: strumento per la gestione contestuale delle prenotazioni da più canali

Q32: Quali sistemi di pagamento dei biglietti utilizzate? (Più risposte possibili)

☐ Contanti ☐ Carta di credito/debito ☐ PayPal ☐ Amazon Pay
☐ Bonifico online ☐ Voucher ☐ Assegno circolare ☐ Altro (specificare)

If you have chosen "other", please specify:

Q33: Fate parte di un network che offre card per l'accesso cumulativo a più istituzioni culturali (adesempio card culturali della Regione)? (Più risposte possibili)

☐ Sì, tessere cartacee

☐ Sì, tessere elettroniche (cioè tessere di plastica con le informazioni memorizzate all'interno del microchip o della banda magnetica presente nella tessera elettronica)

☐ Sì, tessere virtuali (cioè card non fisica visualizzabile da smartphone)

☐ No

Q34: Quali modalità utilizzate per controllare gli accessi dei visitatori a seguito della pandemia? (Più risposte possibili)

☐ Stacco del biglietto di ingresso

☐ Lettore di codice a barre (pistola) con lettura su carta

☐ Lettore di codice a barre (pistola) con lettura su display (es. smartphone)

- [ ] Lettore di QR-code (ovvero, un codice a barre quadrato contenente informazioni leggibili tramite scansione da smartphone)
- [ ] Tornelli o varchi conta persone
- [ ] Foglio cartaceo
- [ ] Foglio elettronico (es. Excel)
- [ ] Non controlliamo gli accessi
- [ ] Altro (specificare)

If you have chosen "other", please specify:

PROMOZIONE E MARKETING

Q35: Come pubblicizzate la programmazione della stagione teatrale? (Più risposte possibili)

- [ ] Volantini cartacei
- [ ] Attraverso canali online di proprietà (sito web, social network..)
- [ ] Attraverso advertising online
- [ ] Comunicazioni dirette attraverso newsletter
- [ ] Canali radiotelevisivi
- [ ] Altro (specificare)

If you have chosen "other", please specify:

Q36: Avete un canale e-commerce per la vendita di prodotti a vostro marchio (merchandising)?

- ◯ Si
- ◯ No, ma abbiamo intenzione di implementarlo
- ◯ No, non abbiamo prodotti a nostro marchio
- ◯ No

Q37: Svolgete qualcuna delle seguenti attività di marketing e comunicazione (gestite internamente o con supporto esterno)? (Più risposte possibili)

- [ ] Advertising online e/o sui social network
- [ ] Attività di Remarketing
- [ ] Ottimizzazione del posizionamento nei risultati del motore di ricerca (SEO: Search Engine Optimization)
- [ ] Utilizzo dei social media per convogliare il traffico Internet verso il sito web o per altre pratiche di marketing
- [ ] Nessuna delle precedenti

RACCOLTA E UTILIZZO DEI DATI

Q38: Raccogliete dati sugli spettatori? (Più risposte possibili)

Nota: Si considerino tutti i dati raccolti (questionari,dati richiesti per l'acquisto del biglietto online ecc.)

☐ Si, tramite raccolta cartacea ☐ Si, tramite raccolta digitale ☐ No

Note: if you have NOT answered/chosen at least one of the following items: [1, 2] in question 38, skip the following question

Q39: Quali sono i dati che raccogliete sugli spettatori? (Più risposte possibili)

☐ Anagrafici (es. età, istruzione ecc.)
☐ Di contatto (es. email)
☐ Sul grado di soddisfazione dello spettacolo
☐ Sul comportamento di acquisto di prodotti culturali (es. spettacoli dell'ultimo anno)
☐ Sul grado di fedeltà del visitatore (es. possesso di abbonamento)
☐ Sul comportamento sui social
☐ Analytics sui canali proprietari (es. comportamento sul sito web)
☐ Risposta alle attività di advertising online e/o offline (es. all'email marketing)

Note: if you have NOT answered/chosen at least one of the following items: [2] in question 38, skip the following question

Q40: In che modo raccogliete i dati?

◯ In modo STATICO (una tantum e senza aggiornamenti periodici)

◯ In modo DINAMICO (con aggiornamenti in tempo reale o in differita man mano che nuove informazioni diventano disponibili o ci sono nuove acquisizioni di dati)

Note: if you have NOT answered/chosen at least one of the following items: [1, 2] in question 38, skip the following question

Q41: Per quali scopi utilizzate i dati raccolti? (Più risposte possibili)

☐ Per indirizzare le strategie di marketing
☐ Per modificare e/o validare i servizi offerti dal Teatro (es. in base agli interessi di specifici cluster di visitatori)
☐ Per scopi previsionali (es. stime su risultati futuri)
☐ Non li utilizziamo
☐ Altro (specificare)

If you have chosen "other", please specify:

SICUREZZA E GESTIONE SPAZI

Q42: In quali ambiti relativi alla SICUREZZA avete investito negli ultimi 3 anni? (Più risposte possibili)

- ☐ Allarmi antincendio, sistemi di rilevamento incendi e fumi
- ☐ Sistemi antifurto e antirapina
- ☐ Sistemi per la salvaguardia della salute e per il distanziamento fisico
- ☐ Impianti di videosorveglianza per il monitoraggio delle aree
- ☐ Sistemi di Cybersecurity e Protezione dati
- ☐ Nessuno
- ☐ Altro (specificare)

If you have chosen "other", please specify:

Q43: Utilizzate tecnologie di tracciamento per la gestione dei magazzini degli allestimenti teatrali?

- ◯ Si, RFID
- ◯ No
- ◯ No, ma abbiamo in programma di adottarle
- ◯ Si, altro (specificare)

If you have chosen "other", please specify:

RFID (Radio Frequency Identification): l'identificazione a radio frequenza èla tecnologia di identificazione automatica che permette di identificare, attribuire un'identità elettronica univoca ad un prodotto/materiale ed autenticarlo e tracciare i suoi movimenti.

Q44: È presente un archivio? (Più risposte possibili)

☐ Si, archivio corrente ☐ Si, archivio storico ☐ No

Archivio Corrente: Si intende l'archivio attualmente in uso composto dai documenti/materiali attualmente prodotti o comunque acquisiti relativi agli affari in corso di trattazione. Pertanto, viene solitamente posto in locali facilmente accessibili per esigenze pratiche.

Note: if you have NOT answered/chosen at least one of the following items: [1, 2] in question 44, skip the following question

Q45: In quale percentuale i vostri archivi storici sono digitalizzati?

◯ 0% ◯ 1% - 25% ◯ 26% - 50% ◯ 51% - 75% ◯ > 75%

RISORSE UMANE

Q46: Avete personale dedicato all'innovazione digitale? (Più risposte possibili)

- ☐ Sì, diverse figure gestiscono le attività digitali, ma non esiste un team dedicato
- ☐ Sì, ci avvaliamo della consulenza di professionisti esterni/ appaltiamo a terzi la gestione dell'innovazione digitale
- ☐ Sì, abbiamo un team composto da varie persone
- ☐ No

Note: if you have NOT answered/chosen at least one of the following items: [1, 2, 3] in question 46, skip the following question

Q47: Specificare di quali professionisti digitali si avvale l'istituzione culturale (alla stessa persona possono corrispondere più ruoli).
Cliccando su ogni ruolo appariranno le descrizioni delle diverse voci.

	Sì, personale interno	Sì, consulenti esterni	Si, condivisi con altri settori/istituzioni	Non presente
Responsabile digital	○	○	○	○
Social media & digital marketing manager / Digital media curator / Social media editor	○	○	○	○
Sviluppatore e Digital user experience developer	○	○	○	○
Responsabile protezione dati (DPO)	○	○	○	○
Light Designer	○	○	○	○
Archivista con competenze digitali	○	○	○	○

PRODUZIONE ARTISTICA

Q48: Utilizzate un software di supporto a una delle seguenti attività? (Più risposte possibili)

- ☐ Movimentazione macchinari
- ☐ Impianto illuminazione
- ☐ Impianto acustico
- ☐ Scenografie digitali
- ☐ No

Q49: Utilizzate tablet durante la fruizione dello spettacolo? (Più risposte possibili)

- ☐ Si, come spartiti digitali
- ☐ Si, per comunicazioni e aggiornamenti live durante lo spettacolo all'orchestra
- ☐ Si, per comunicazioni e aggiornamenti live durante lo spettacolo al personale tecnico "dietro le quinte"
- ☐ No, non sono disponibili
- ☐ No, ma abbiamo intenzione di adottarli
- ☐ Altro (specificare)

If you have chosen "other", please specify:

ONLINE STREAMING

Q50: Offrite agli utenti la possibilità di vedere spettacoli in online streaming?

- ◯ Sì, lo facevamo già prima della pandemia
- ◯ Si, lo abbiamo fatto solo durante il periodo di lockdown
- ◯ Si, abbiamo iniziato durante il periodo di lockdown e stiamo continuando a offrire questa possibilità
- ◯ No, ma abbiamo in programma di implementarlo
- ◯ No

Q51: Durante la pandemia il teatro è riuscito a riorganizzarsi erogando spettacoli e/o rendendo disponibili contenuti in modo alternativo? (Più risposte possibili)

- ☐ Sì, abbiamo pubblicato contenuti/video inediti sui nostri canali
- ☐ Sì, abbiamo erogato spettacoli online gratuiti
- ☐ Si, abbiamo erogato spettacoli online a pagamento
- ☐ No

LOCALIZZAZIONE & TIPOLOGIA DI ISTITUZIONE

Q52: Specificare la regione sede dell'Istituzione Teatrale

◯ Abruzzo	◯ Basilicata	◯ Calabria	◯ Campania
◯ Emilia Romagna	◯ Friuli Venezia Giulia	◯ Lazio	◯ Liguria
◯ Lombardia	◯ Marche	◯ Molise	◯ Piemonte
◯ Puglia	◯ Sardegna	◯ Sicilia	◯ Toscana
◯ Trentino Alto Adige	◯ Umbria	◯ Valle D'Aosta	◯ Veneto

Q53: Specificare il tipo di Istituzione Teatrale

- ◯ Teatro di Tradizione
- ◯ Teatro Nazionale
- ◯ Altro (Specificare)
- ◯ Teatro di rilevante interesse culturale
- ◯ Fondazione lirico-sinfonica

If you have chosen "other", please specify:

Q54: Specificare la forma di governance della vostra istituzione

- ◯ Ente pubblico
- ◯ Ente totalmente privato
- ◯ Ente a capitale prevalentemente pubblico
- ◯ Ente a capitale prevalentemente privato

Q55: Indicare la presenza di una massa artistica stabile all'interno del teatro

- ☐ Corpo di ballo
- ☐ Coro
- ☐ Orchestra
- ☐ Nessuna delle precedenti
- ☐ Compagnia teatrale

Vi ringraziamo per aver compilato il questionario!

Ricordiamo che i risultati di questa indagine, di cui ha gentilmentecontribuito, saranno utilizzati esclusivamente in forma aggregata e anonima ed andranno a costituire parte integrante della Ricerca 2021-2022 dell'Osservatorio Innovazione Digitale nei Beni e Attività Culturali. I risultati della Ricerca, oltre ad essere condivisi con i rispondenti, verranno presentati in occasione del Convegno finale che si terrà il prossimo 7 Giugno 2022 (riceverete l'invito a partecipare a ridosso dell'evento).

B. Digital KPIs Score Computation

Organizational Structure	Digital KPI	Related Question	Answers	Note for computation	KPI score
Strategy	Digital plan presence	Do you have a formalized strategic digital innovation plan?	No		0
			Yes, within another document		75
			Yes, there is a dedicated document		100
	% of investments in digitalization	Considering the total amount of annual investments, indicate the average percentageof investment destined for digital (digital tools,internal staff, purchase of external services) in the last two years:	No digital investment		0
			1% - 10%		10
			11% - 25%		25
			26% - 50%		50
			51% - 75%		75
			76% - 100%		100
Personnel	Presence of staff dedicated to innovation	Do you have staff dedicated to digital innovation?	No dedicated figure for digital innovation		0
			Several figures manage digital activities but there is not dedicated team		50
			We consult external professionals		75
			We have a dedicated team of several people		100

	Number of digital professionals	Specify which digital professionals the theater relies on: • Archivist with digital competences • Light designer • DPO • Digital user experience developed • Social media manager • Digital Responsible	No, not available	For each digital profession, the KPI score has been measured as represented in the right column. Then, the final score has been computed as a weighted average of the different scores. $KPI_{\#digital\ professional} = \sum_{i=1}^{6} \frac{1}{6} * Score_i$	0
			Yes, external consultants		75
			Yes, shared with other sectors / institutions		100
			Yes, internal staff		
Administrative Activities	Number of Activities managed with advanced digital systems (not excel)	Specify for which of the following activities you have computerized management systems (not Excel)	Accounting	The score has been computed dividing the number of options selected by the delighter number (equal to 8). $KPI_{\#activities\ managed\ digitally} = \frac{1}{8} * selected\ options$ For example, a theater managing 4 activities digitally: KPIscore=50	
			Reporting		
			Suppliers / Purchasing		
			HR management		
			Artistic programming		
			Space management		
			Management of educational activities		
			Management of funds and financing		
	ERP implementation	Do you have an ERP system?	No		0
			No but we have planned to implement it in future		30
			Yes		100
	CRM implementation	Do you have CRM software?	No		0
			No but we have planned to implement it in future		30
			Yes		100

Core Activities	Digital KPI	Question	Answers	Note for computation	KPI score
Artistic production	Number of Software/technologies used on-stage	Do you use software to support any of the following activities?	We do not use any software	The score has been computed dividing the number of options selected by the delighter number (equal to 4). $KPI_{\#of\ software\ used\ on\ stage} = \frac{1}{4} * selected\ options$ For example, a theater having in place 3 software KPIscore=75	
			Lighting system		
			Sound system		
			Digital scenery		
			Machinery handling		
Online content	Presence of Online streaming	Do you offer spectators the opportunity to watch shows in Online streaming?	No		0
			Yes, only during the lockdown period		60
			Yes, we started during the lockdown and we are continuing to offer this possibility		90
			Yes we were already doing this before pandemic		100

On-site Technologies	Number of technologies for customer engagement	Which technologies are offered to visitors and viewers?	None	The score has been computed dividing the number of options selected by the delighter number (equal to 4). $KPI_{\#\text{onsite technologies}} = \frac{1}{4} * selected\ options$ For example, a theater having 1 technology in place: KPIscore=25
			Wi-fi	
			Audioguide	
			Interactive totems	
			QR code	
			LIS video	
			AR	
			Touchscreen	
			Beacon	
			Display	
			MR	
			VR	
			NFC	
	Number of technologies to control access	What methods do you use to control visitors' access?	Turnstiles or people counting gates	The score has been computed dividing the number of options selected by the delighter number (equal to 3). $KPI_{\#\text{accesstechnologies}} = \frac{1}{3} * selected\ options$ For example, a theater having 3 technologies in place: KPIscore=100
			Spreadsheet (e.g., Excel)	
			QR-code reader	
			Paper sheet	
			Entrance ticket detachment	
			Bar code reader with read on display	

			Bar code reader with paper readout		
			Other		
Logistic	% of digitalization of archives	Which percentage of your historical archives are digitized?	0%		0
			1% - 25%		25
			26% - 50%		50
			51% - 75%		75
			76% - 100%		100
	Presence of technologies for traceability of materials	Do you use tracking technologies for inventory management?	No		0
			No, but we have planned to adopt it		30
			Yes		100
Marketing	Website presence	Do you have a dedicated website?	No		0
			Yes, within other websites		75
			Yes, shared with other cultural institutions		90
			Yes, shared with other institutions of out theatrical network		
			Yes, related only to our institution		100

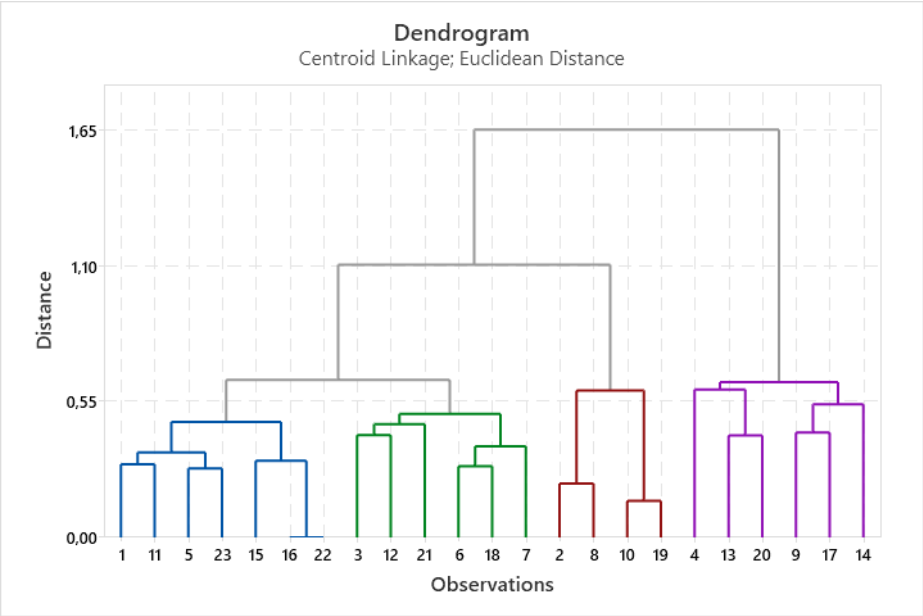
	Number of social media accounts	What social accounts do you have?	Facebook	The score has been computed dividing the number of options selected by the delighter number (equal to 6). $KPI_{\#\text{social accounts}} = \frac{1}{6} * selected\ options$ For example, a theater having 3 social networks KPIscore=50	
			Instagram		
			YouTube		
			Twitter		
			LinkedIn		
			TikTok		
			Pinterest		
			WhatsApp		
			Vimeo		
			Other		
	App presence	Do you have a mobile App?	No		0
			No, but we have planned to include it		30
			Yes		100
	Number of feedback platforms	What feedback platforms are you on?	None	The score has been computed dividing the number of options selected by the delighter number (equal to 3). $KPI_{\#\text{feedback platforms}} = \frac{1}{3} * selected\ options$ For example, a theater having 3 feedback platforms KPIscore=100	
			Google my Business		
			Facebook places		
			Foursquare		
			TripAdvisor		

	Number of online marketing and advertising tools	Do you carry out any of the following online marketing activities?	None	The score has been computed dividing the number of options selected by the delighter number (equal to 4). $KPI_{\#\text{online marketing tools}} = \frac{1}{4} * selected\ options$ For example, a theater having 3 online marketing tools KPIscore=75	
			Online and/or social network advertising		
			Use social media to drive internet traffic to the website		
			SEO		
			Remarketing		
	Adoption of digital data management and collection activities	Do you collect data?	No	0	KPI $_{\text{Data management}}$ =Data collection score * (0,5 * Collection methos + 0,5 * purposes of collection)
			Yes, via paper collection		
			Yes, via digital collection	100	
		How do you collect data?	Statically	50	
			Dynamically	100	
		For what purpose do you use the collected data?	No	The score has been computed dividing the number of options selected by the delighter number of purposes (equal to 3). $KPI_{\#\text{puposes of use}} = \frac{1}{3} * selected\ options$ For example, a theater collecting data for 2 purposes. KPI score =66,67	
			Address marketing strategies		
			Modify and/or validate services offered		
			Forecasts		
			Other		
Ticketing & Booking	% of ticketing revenues from online channels	Made 100 the revenues from ticketing, indicate the percentage by channel for the year 2021	Onsite ticket office	$KPI\ score = \sum Online\ channels\ percentages$	
			Theaters' proprietary website or app		
			Other physical channels		

C. Cluster Analysis – Minitab Statistic

Amalgamation Steps

Step	Number of clusters	Similarity level	Distance level	Clusters joined		New cluster	Number of obs. in new cluster
1	22	100,000	0,00000	16	22	16	2
2	21	96,821	0,14750	10	19	10	2
3	20	95,293	0,21842	2	8	2	2
4	19	93,984	0,27918	5	23	5	2
5	18	93,780	0,28861	6	18	6	2
6	17	93,620	0,29607	1	11	1	2
7	16	93,310	0,31042	15	16	15	3
8	15	92,577	0,34447	1	5	1	4
9	14	92,047	0,36905	6	7	6	3
10	13	91,099	0,41301	13	20	13	2
11	12	91,062	0,41477	3	12	3	2
12	11	90,856	0,42433	9	17	9	2
13	10	90,121	0,45841	3	21	3	3
14	9	89,922	0,46767	1	15	1	7
15	8	89,216	0,50040	3	6	3	6
16	7	88,383	0,53905	9	14	9	3
17	6	87,173	0,59523	2	10	2	4
18	5	87,100	0,59859	4	13	4	3
19	4	86,454	0,62856	4	9	4	6
20	3	86,246	0,63821	1	3	1	13
21	2	76,205	1,10417	1	2	1	17
22	1	64,431	1,65049	1	4	1	23



Cluster Centroids

Variable	Cluster1	Cluster2	Cluster3	Cluster4	Grand centroid
Organization	0,306099	-1,44800	-0,640763	1,24898	0,0000000
Activities	-0,051417	-1,22646	-0,469348	1,34697	0,0000000

Distances Between Cluster Centroids

	Cluster1	Cluster2	Cluster3	Cluster4
Cluster1	0,00000	2,11130	1,03499	1,68657
Cluster2	2,11130	0,00000	1,10673	3,72777
Cluster3	1,03499	1,10673	0,00000	2,62110
Cluster4	1,68657	3,72777	2,62110	0,00000

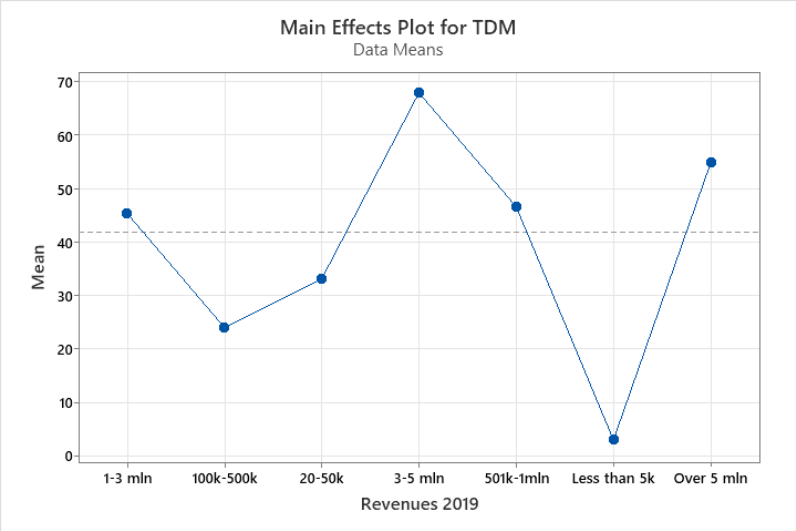
D. Anova One Way – TDM vs Ticketing Revenues (2019)

- Relevant statistical indexes

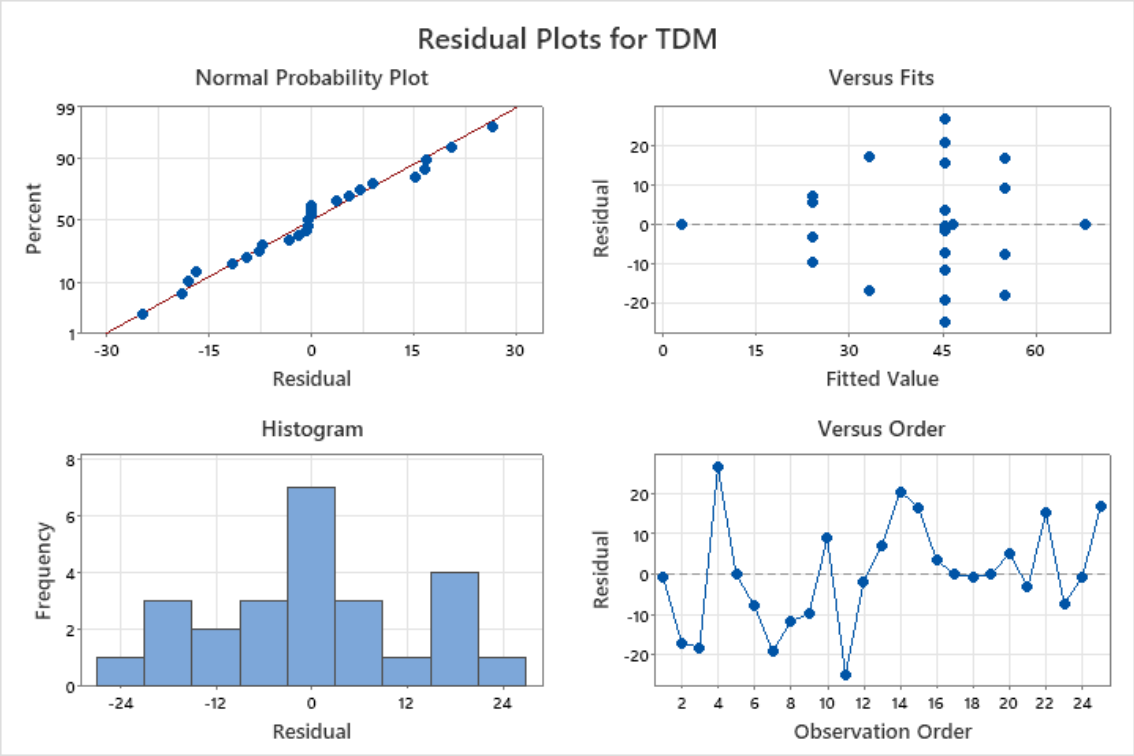
Model Summary

S	R-sq	R-sq(adj)	F-Value	P-Value
15,0147	52,29%	36,39%	3,29	0,023

- Main Effects Plot



- Residual plots for ANOVA hypotheses



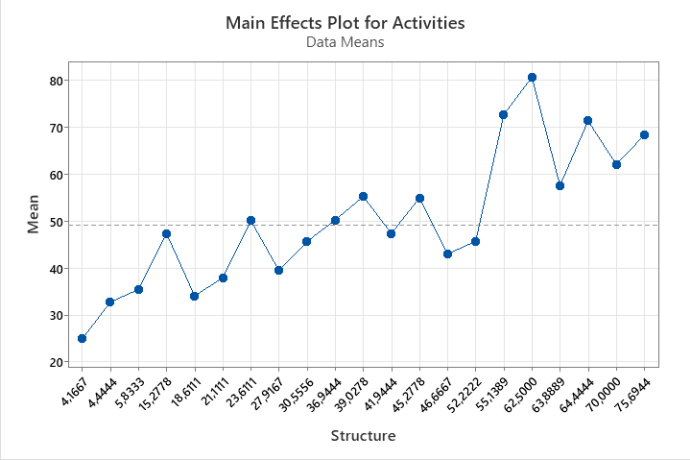
E. Core Activities vs Organizational Structure

- Relevant statistical indexes

Model Summary

S	R-sq	R-sq(adj)	F-Value	P-Value
4,66667	99,06%	89,67%	10,55	0,090

- Main effects plot



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