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ORIGINAL

DISSEMINATING TRADITIONAL CULTURE THROUGH NEW MEDIA: IMPLICATIONS FOR SPORTS, FITNESS, AND ATHLETE ENGAGEMENT

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ABSTRACT

This study examines the dissemination mechanisms of traditional culture within the new media environment using Petri networks, focusing on sports, fitness, and athlete engagement. By leveraging Web integration and advanced media strategies, the research aims to enhance the transmission of cultural heritage, such as traditional Chinese poetry, amidst the growing complexity of digital networks. Addressing challenges like packet loss, communication delays, and quantization errors in network-controlled systems (NCS), the study proposes optimized clustering algorithms for more accurate network structure data. The findings emphasize the importance of preserving and promoting cultural heritage through innovative digital means.

KEYWORDS: Traditional, Petri Network, Dissemination, Mechanism, Environment

1. INTRODUCTION

The dissemination of traditional culture through new media has become an essential aspect of cultural preservation and promotion in the digital age. This study focuses on leveraging Petri networks to model and enhance the transmission of cultural heritage, with a specific emphasis on its application in the sports and fitness sectors. Traditional culture, encompassing practices, values, and artistic expressions passed down through generations, plays a significant role in shaping the identities and values of societies. However, the advent of digital technology and new media platforms presents both opportunities and challenges for effectively communicating and preserving

these cultural elements.

Traditional culture enriches the sports and fitness sectors by embedding historical and cultural values into physical practices and disciplines. For instance, martial arts, yoga, and traditional dance are not only physical activities but also cultural practices that convey historical narratives, philosophies, and community values. For athletes, engaging with these traditional practices can enhance their physical and mental well-being, providing a deeper sense of identity and purpose. Moreover, promoting traditional culture within sports can foster a sense of community and continuity, linking modern practices with historical legacies(Ai, Chen, He, Lai, & Qiu, 2018).

1.1 The Role of New Media in Cultural Dissemination

New media, characterized by digital platforms such as social media, video streaming services, and interactive websites, offers unprecedented capabilities for disseminating traditional culture to a global audience. These platforms enable real-time interaction, community building, and multimedia content sharing, which are crucial for engaging younger generations. However, the vast and decentralized nature of new media also presents challenges in maintaining the authenticity and accuracy of cultural representations. Effective dissemination through new media requires strategic use of technology to manage and curate content, ensuring that it remains true to its cultural roots.

1.2 Petri Networks as a Modeling Tool

Petri networks, a mathematical and graphical tool used for modeling distributed systems, are particularly effective in representing complex interactions and processes. In the context of cultural dissemination, Petri networks can model the flow of information across digital platforms, identifying key nodes and pathways that facilitate or hinder the spread of cultural content. By simulating different dissemination strategies, Petri networks can help optimize the transmission of traditional culture, ensuring it reaches a wide audience while maintaining its integrity.

1.3 Addressing Challenges in Network-Controlled Systems (NCS)

The study also addresses technical challenges associated with network-controlled systems (NCS), such as packet loss, communication delays, and quantization errors. These issues can significantly impact the efficiency and reliability of digital platforms used for cultural dissemination. By developing optimized clustering algorithms and enhancing the resilience of NCS, the research aims to improve the performance of these systems in transmitting cultural content. This is particularly important for live streaming and real-time interactive platforms, where delays and data loss can disrupt the user experience(Wei-Dong, Qian, & Jie, 2018).

1.4 Research Objectives and Scope

The primary objective of this research is to explore how Petri networks can enhance the dissemination of traditional culture through new media, focusing on the sports and fitness sectors. Specific goals include:

1. Modeling the dissemination process using Petri networks to identify optimal pathways and strategies.

2. Analyzing the impact of new media on the promotion of traditional cultural practices in sports and fitness.

3. Addressing technical challenges in NCS to ensure efficient and reliable transmission of cultural content.

4. Providing recommendations for leveraging new media to foster deeper engagement with traditional culture among athletes and sports enthusiasts.

In the integration of traditional culture with new media offers significant potential for enriching the sports and fitness experience. By utilizing Petri networks to model and optimize the dissemination process, this research aims to provide valuable insights and practical recommendations for preserving and promoting cultural heritage in the digital age. The following sections will delve deeper into the methodology, analysis, and findings of this study, offering a comprehensive understanding of how new media can be harnessed to maintain and enhance traditional cultural practices in sports and fitness.

1.5 Dissemination of Intangible Cultural Heritage Via Innovation

As was already noted, one of the ways that a modern civilization may safeguard intangible cultural heritage is through disseminating it. Because of this, we must consider how and how to propagate. Figure 1 lists four distinct unique ways of dissemination.

Figure 1: Distribution of intangible cultural heritage via innovation

1.5.1 Re-establishing a Connection with Modern Life

The solid connection between immaterial social legacy and individuals' day to day routines gives it its life. Subsequently, it is lacking to depend simply on individual inheritors to pass down inside a specific social insurance circle, as this isolates and closes the inheritance and creates little to no contact with the lives of the wider public. The protective barrier will gradually disappear. While times have changed and civilizations have moved, intangible cultural legacy used to play a significant role in our lives. As a result, this method of wholly disengaging from life cannot survive (Chen, Du, Zhang, Han, & Wei, 2021; Chen, Zhang, Wu, You, & Ning, 2021). In order to create a relationship, intangible cultural heritage should be infused with contemporary life. It can return to people's lives as a component of cultural composition, even though it cannot return to the central role of human production and living

1.5.2 Roles of Restoration of Intangible Cultural Heritage

Spreading ethnic culture and helping social certainty are the significant reasons for elusive social resources. For example, creatively colouring strategy might be utilized to colour pieces of clothing, much as paper-cutting can be utilized as design. One of the essential drivers of the trouble in passing down elusive social legacy is the totally unique creation and way of life of individuals today because of the progression and advancement of science and innovation. This has brought about the continuous loss of numerous immaterial social legacies' unique use capabilities. Thought of whether the immaterial social legacy can create and get through depends to some degree on whether the working can be re-understood. Hence, in order for intangible cultural property to continue to be proudly passed down, it is important to re-establish its usefulness with the aid of new circumstances and technology.

1.5.3 Recultivation of Cultural Identity

The personality of individuals as a specialized device is essential if a culture has any desire to be lively and vigorous. A good social environment can establish a favourable environment for the transmission of immaterial social legacy (Ma, Yu, Ji, & Yang, 2019). What’s more, a half? Additionally, it assists individuals with deliberately perceiving their huge commitment to the transmission of immaterial social inheritance, empowering individuals to shield and pass on the elusive social legacy normally.

1.5.4 Changes in the Way of Inheritance

Notwithstanding the reconnection with individuals' lives, the recreation of capabilities, and the re-development of social pride referenced above for the legacy of immaterial social legacy in the contemporary social setting, working on the unconstrained legacy of elusive social heritage is likewise important (L.

Zhang, 2017). The quest for new media starts to lead the pack in the getting of outer powers to propel the transmission of elusive social legacy. Liveliness is a rising business; subsequently it normally incorporates with the present fast social dispersion. Liveliness is an especially ideal new media for the transmission of immaterial social legacy since it is a spearheading portrayal of visual culture and a huge part of the ongoing social industry.

2. Review of Literature

The significance of social components is maintained from the perspective of social self-assurance, and it is held that these parts are things, peculiarities, and spirits that have step by step collected in the drawn out verifiable improvement process, with long haul congruity, time, and internationalization, and are pertinent parts from a traditional culture that recognize from different countries and districts and feature the public qualities of culture. Moreover, it is recommended that there are a few justifications for why social viewpoints ought to be passed down and advanced: one is firmly connected with individuals' current necessities, another is the business powers behind commercialization, and a third is the otherworldly draw of recovery. The essential characteristics of social components are additionally realities and extraordinary upsides of worldwide importance that are the result of long haul public mindfulness and self-screening, which is summed up and developed in this section. This article repeats the necessities of contemporary society with regards to social self-assurance, so the possibility of social components is of some common sense importance; in any case, it doesn't recommend proficient procedures for the dissemination and improvement of social components, and it is obvious that examination on the use of social components is still basically cantered around the social points of view of different ventures, with less exploration on the frameworks level (Lejun Zhang, Li, Zhao, & Lei, 2017). As a general rule, in spite of the fact that there are sure accomplishments and progress in the meaning of the idea of social components and related research, notwithstanding the quick improvement of the Web lately and the social melding and correspondence changes achieved by it, the idea and advancement of social components will undoubtedly create specific turns of events, particularly for the meaning of the worldwide correspondence of social components and the understand The market and the board advancements in view of the Web stage, which presents critical opportunities for the imaginative improvement of traditional enterprises and furthermore cultivates the creative advancement of the media business, ought to take on comparing inventive methodologies with regards to the development of creation mechanisms, advertising techniques, administrations, and media item encounters.(Cobb, 2005) The media area upheld by "Internet+" exhibits the development pattern of normalizing new innovation application, enhancing plans of action, and normalizing strategy the board, which fills in for instance and a perspective for the activity and organization of China's media area. However, clearly the exploration on social

perspectives has not developed correspondingly with the progression of the times and the requests of correspondence, and this study is intended to address the essential holes. The thought of "science, workmanship, and humanities" is epitomized in the multidisciplinary field of advanced media craftsmanship, which consolidates the inherent sciences, sociologies, and humanities. "Computerized innovation" alludes to its mechanical underpinnings, "media" to its noticeable quality in the media area, and "craftsmanship" to every one of the fields wherein it could be utilized to the development of works of art and the imaginative plan of advanced media merchandise, it is recommended that social legacy associations (like artistic work exhibitions) ought to continually work on their utilization of advanced media. The presentation configurations may now coordinate and oblige a more extensive assortment of utilization terminals and information designs since the editors have effectively expanded the practical points of interaction of the display lobbies, making the corridors' plan more liquid and hearty in light of multi-contact innovation Valenzuela S 2019 Huge number of unfamiliar computerized display lobbies have been advanced on the web, where clever media-based advances are continuously developing, and a considerable lot of them have accurately situated their showcase structures. Computerized media craftsmanship has its particular imaginative qualities. Its peculiarity is for the most part reflected in "innovation based craftsmanship," like vivid workmanship, computer generated reality craftsmanship, network workmanship, and other fine arts emphatically attached to innovation, notwithstanding the key qualities of customary workmanship.(Schober, Pasek, Guggenheim, Lampe, & Conrad, 2016). There will be extra changes in computerized media craftsmanship because of the continuous improvement of computerized innovation the "web" admittance to culture has offered the opportunity to choose the settings for social material as increasingly more social stuff opens up as assets. Those lacking media proficiency risk being caught in "data cases," persistently engrossing homogenous social stuff, as per the reasoning behind cunning algorithmic advancements.

3. Petri Nets Modeling

The coloured Petri net (CPN) modelling technique may explicitly verify a range of resource kinds and execution logic. The suggested technique enables the creation of small models for issues with work scheduling. Also, the built-in simulation method enables the examination of various task allocation problem performance features before to any implementation phase.

3.1 Complete System Model

The RDPCTH in Figure 1 serves as an overall representation of the network-controlled framework.(Kanaan & Suveren, 2017) A RDPCT is addressed by every deliberation change, which incorporates the regulator,

Ethernet switch, actuator, interaction, sensor, and one added substance traffic (PC1 and PC2) to charge the network (or RDPCTH for the Ethernet switch reflection progress). The areas portrayed in this model compare to the information and result ports between every module, but the "impede" area is utilized to distinguish delays. In view of the limiting circular segment between the progress and the spot, the change must be real when the spot is vacant of tokens. A twofold situated circular segment fills in to act as an illustration of its portrayal in shaded Petri nets, all the more particularly in the CPN Devices device (arrowed at the two finishes).'

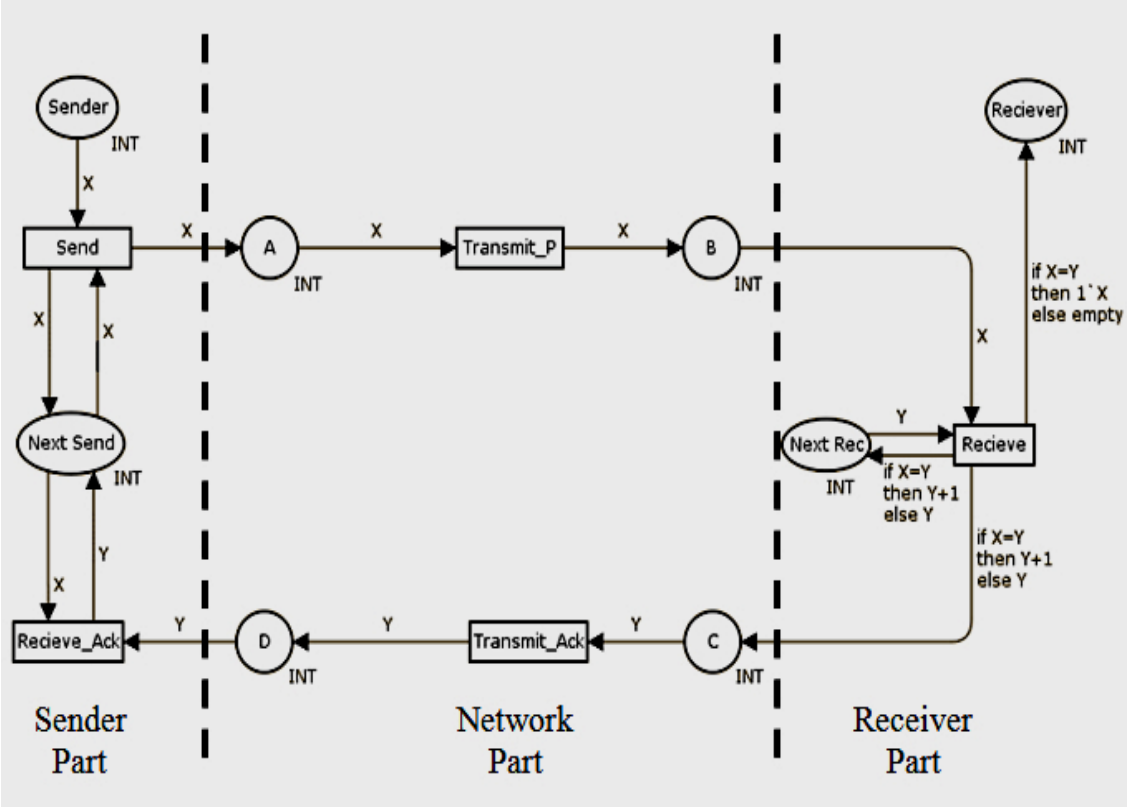

Figure 2: CPN modelling of NCS

3.2 Modelling of Ethernet switches

All figures 2 portrays our Ethernet network model, which depends on CPN, alongside its inner capabilities. The cycles of putting away, directing, grouping, and planning bundles through which the stream crosses should be demonstrated to do the displaying and execution examination of an exchanged Ethernet network design, as depicted in. To be specific, the edge's stockpiling in a FIFO input memory. (Hayes & Guardino, 2013) The steering activity that moves the parcels to the right result line is then introduced to the stream. The activity of characterization, which is portrayed in Figure 3, is the subsequent stage and empowers the choice of the parcels in light of their needs in the significant result lines. At long last, these bundles are shipped off the result as per the switch's booking calculation.

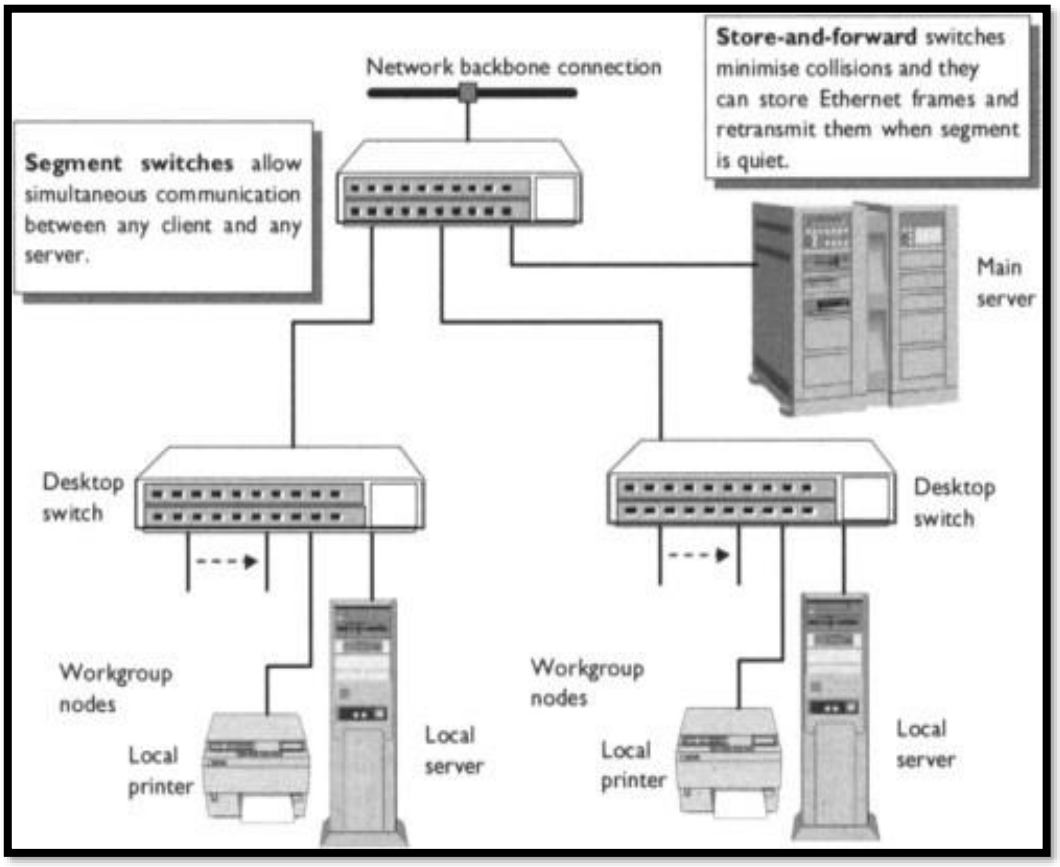

Figure 3: Ethernet switch type

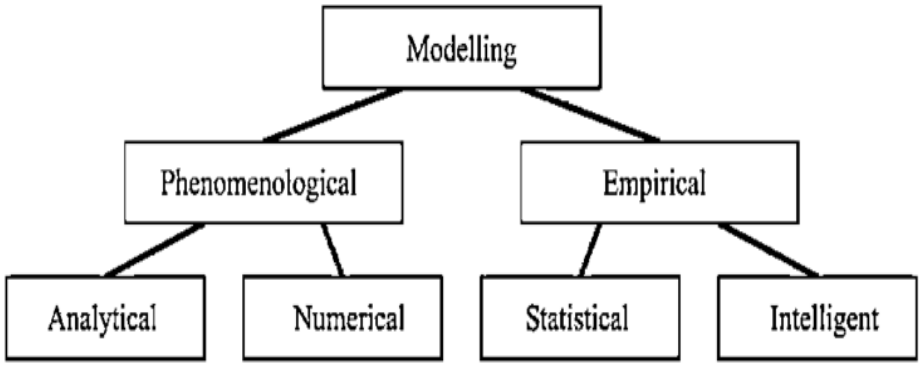

Figure 4: Classification modelling

3.2.1 Scheduling Policy Modelling

The booking system happens at the FIFO yield lines' result. A technique for weighted cooperative planning decides how the approaches are sent and (see Figure 4). This calculation is fabricated utilizing a fair cycle (serve thus and as indicated by their weight). When the objective number is achieved and "w1" becomes 0, high-need parcels are adjusted prior to changing to bring down need bundles.

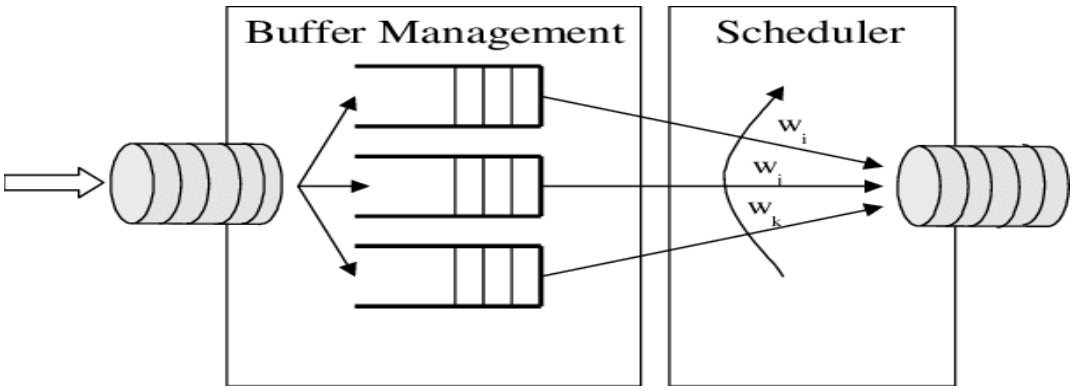

Figure 5: WRR scheduler in the CPN model

3.3 Detection Delay Mechanism Model (Process)

A computation strategy has been made and added to the cycle model to represent the defer brought about by the Ethernet switch. The spot port "net-input1" and in the defer estimation place, which is a cycle input port spot, are utilized to communicate the order esteem determined in the order module to the switch module (Figure 4). The edges are shipped off the cycle through the cycle in port when the actuator gets them. The intTime () strategy is utilized to extricate the time marks associated with the tokens that show up at the cycle set up and the postpone calculation place: fun in Time I = IntInf.toInt (time ()). This capability transforms the time mark's portrayal into a whole number, which is of the kind @ + T (exp: @ + 5). The capability deducts I y) (C-D progress), which is connected with a progress, plays out a deduction procedure on these factors.

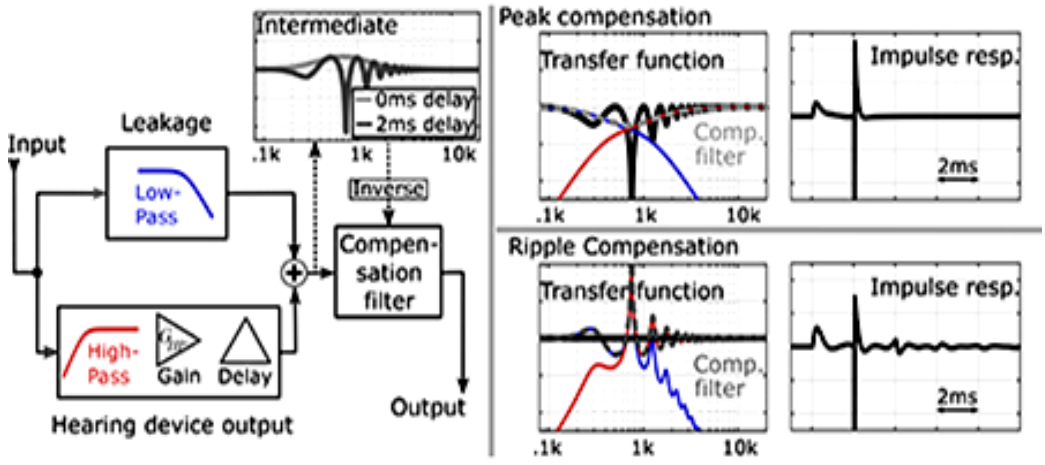

Figure 6: A method with detection delay controls

When it is completed, the thing that matters are found. The two different ways recorded underneath can be used to reuse this worth are: (i) In the primary situation, the times surpass at least one example stretches. As the changes in

"cpn Tools" (the Petri nets test system) are P-coordinated, the token should stand by Te units of time to convey the figured state xk while the plant change is dynamic. Envision, nonetheless, that the time tag (t1) on the symbolic passing on the data uk has a higher worth than the time tag (t2) on the token remembered for the clock.

Then, before the token in the clock might cross the plant change, it should stand by (t1-t2) units of time. After Te units of time, the recently registered esteem xk is then sent to the sensor. Basically, the clock's symbolic will presently be named (t1-t2) + Te, which could prompt a mistake in the information handling (Change determination uk-xk). The states to be viewed as in the estimation of the framework's next state are chosen by the xk-uk determination capability connected to the progress choice uk-xk (Lenze, 2017). (ii) In the second scenario, by knowing this number, the network may be managed to reduce delays.

4. Simulation Results

Assume a straightforward controlled system whose difference equation is as follows:

$$x(k+1) = Ax(k) + Bu(k)$$

$$Y(k) = cx\ \ (k)$$

With no order criticism, this framework is unsound, yet it could be made due

The suggested order is as per the following:

$$u(k) = -Fx(k)$$

According to this state feedback command minimises the quadratic criteria J while stabilising the system. with: 1.05, 1.8, and 0.3594 for A, B, and F. illustrate the declarations for all variables, hues, and functions. The modelling of the suggested models yields the findings shown in Table 1and 2 In Table 3 the simulation parameters are listed.

Table 1(a): Ideal behaviour

IDEAL BEHAVIOUR		
COMMANDED	**SYSTEM RESPONSES**	**SET POINT**
2.1	3.2	1.2
2.6	3.5	1.9
3.2	4.1	2.2
3.9	4.6	2.7
4.1	4.8	5.6

Table 1(b): Ideal behaviour

IDEAL BEHAVIOUR		
4.9	5.3	6.1
5.1	5.9	6.7
5.9	6.1	7.2
6.3	6.8	7.9
7.1	7.9	8.1

Table 2: Behaviour under network-induced delay

IMPACT OF THE INCLUDE DELAY		
COMMANDED	**SYSTEM RESPONSES**	**SET POINT**
2.2	1.3	1.5
2.9	2.6	1.9
3.2	3.1	2.4
3.7	4.2	2.9
4.1	4.9	4.2
4.5	5.5	4.6
5.2	5.7	5.2
5.9	6.2	5.8
6.2	6.9	6.2
6.9	7.2	7.9

Table 3: Simulation parameters

PARAMETERS	REAL VALUE	MODEL VALUES (NS)
LATENCY	600ns	600
PRODUCER PERIOD	2 ms	1.25632
CONSUMER PERIOD	2 ms	1.25486
DELAY DUE TO STORE AND FORWARD MODE	31.3 us	61.236

5. Discussion and Promising Areas

Table 1 displays the system's reaction in the absence of a network. The system performs almost perfect and follows the set point (Schäfer, 2015). Table 2 depicts the system's reaction to a fluctuating network when it is connected to a network, and the curve is overshot before it reaches the set point. Due to the delay the network causes, we see that the system becomes less stable To solve this bothersome issue, we suggest using SDN as a way of network control to reduce the delay caused and shield the system from its destabilising impact. Installing a WRR weight controller with the following features and wired directly to each switch as indicated in Figure 14 constitutes this approach.

I. Survey the strength of the cycle (postpone in the perception, ordinarily

quicker in light of the fact that this perception is practically prompt) (Cai & Wei, 2020). ii. Send the WRR loads to the various switches through committed associations (wire-to-wire), which is quicker since arrangement messages are not dialled back by other traffic. Step (iii) involves refreshing the switch loads (defer in the design and in the treatment of the soaked cushions prior to getting back to a steady framework) (Liang, Zhang, Liu, & Ma, 2020).

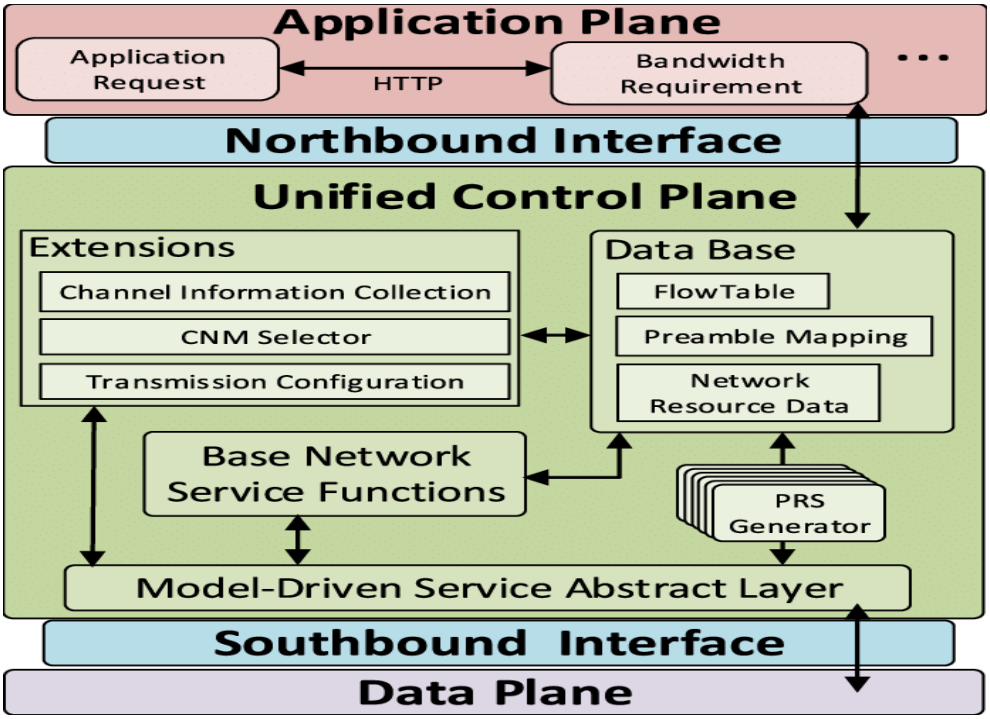

Figure 7: A design concept using an SDN controller

A networking procedure called SDN is expected to extend the extent of network organization and coordination. Future networks, where the virtualization of assets and network administrations is the crucial worldview, should think about this. Many studies suggest using SDN to programmatically control networks, make it easier to roll out new services and applications, and optimise network scheduling and performance. The way networks are designed, constructed, and managed has undergone a considerable transformation as a result (Liu & He, 2020; Liu, Tang, & He, 2021).As a result, SDN is now more commonly acknowledged as an architecture that allows applications to run on the network. It permits the network to all the more precisely distinguish the sent applications with the goal that it might better oversee them (nature of administration, security, traffic designing, and so forth.). The growing replacement of conventional networks with SDN gives the opportunity to govern the network depending on application needs, despite it still being constrained in the business setting. Minimizing resource forwarding delays in order to minimise both human and material damages is one of the key issues that occur during emergencies. The movement of a switch between two controller

instances is the subject of solutions. Due to controller resource limitations and to guarantee there is as little network outage as possible, careful preparation is necessary while transferring many switches. According to the studies in while the solution is in use, the emergency traffic's delay decreases by 33 percent. The authors of provide a brand-new SDN-based network security solution that is simple to integrate with the current network architecture and offers protection for all network components. This method eliminates the single point of failure issue, enabling the establishment of new network barriers to offer a layered defensive system, and makes it easier to defend the network from intrusions and malevolent users (Wang et al., 2017).An idea and an answer for relocation booking are likewise displayed in Banner, involving an assortment of change movements as contribution to make a relocation plan with thought for regulator asset and administration disturbance restrictions.

6. Conclusion

This study highlights the significant potential of using Petri networks to optimize the dissemination of traditional culture through new media, particularly within the context of sports, fitness, and athlete engagement. By effectively modeling the dissemination process, Petri networks provide a robust framework for understanding and enhancing how traditional cultural content can be shared and preserved in the digital age. The integration of new media technologies offers a powerful platform for reaching a broader audience, ensuring that cultural heritage remains vibrant and relevant. The research underscores the critical role of addressing technical challenges in network-controlled systems, such as packet loss, communication delays, and quantization errors. By developing optimized clustering algorithms, this study enhances the efficiency and reliability of digital platforms, ensuring a seamless transmission of cultural content. This is especially important for live streaming and interactive media, where maintaining the integrity of the cultural message is paramount. Moreover, the findings suggest that new media can significantly influence the promotion of traditional culture within the sports and fitness sectors. By fostering a deeper connection between athletes and their cultural heritage, these technologies not only enhance the cultural experience but also contribute to the overall well-being and performance of athletes. The interactive nature of new media allows for a dynamic and engaging way to explore traditional practices, making them accessible and appealing to a younger, tech-savvy generation. Future research should focus on expanding the scope of this study to include a broader range of cultural elements and sports disciplines. Additionally, exploring the integration of other advanced technologies, such as artificial intelligence and virtual reality, could further enhance the dissemination and engagement with traditional culture. Collaborative efforts between cultural experts, technologists, and sports organizations will be crucial in developing comprehensive strategies for preserving and promoting cultural heritage in the digital age. (Mikhailova, 2020). (Y. Zhang, Chen, & Rohe, 2022) In this research provides a foundational

framework for leveraging Petri networks and new media to enhance the dissemination of traditional culture. By addressing both technical and cultural challenges, the study offers practical solutions and insights that can be applied to a wide range of settings. This approach not only preserves cultural heritage but also enriches the sports and fitness experience, ensuring that traditional practices continue to thrive in a modern, interconnected world.

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