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Zen "Kong" in Japanese Aesthetics

The Impact of Built Environment Design

Highlights

Employability for Autistic Graduates

Regulation Model of Open Banking in China

Discovering Thoughts, Inventing Future

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Contents of the Issue

i. Copyright Notice
ii. Editorial Board Members
iii. Chief Author and Dean
iv. Contents of the Issue

1. Enhancing Employability for Autistic Graduates: Using TRIZ Theory to Design Virtual Reality Solutions for Fostering Inclusive Communications in Workplace Environments. *1-14*
2. The Role Played by Zen "Kong" in Japanese Aesthetics. *15-24*
3. Forensic Sciences at 50: Past, Present and Future? *25-31*
4. The Legal Regulation Model of Open Banking in China. *33-49*
5. Entrepreneurship as a Lever for Growth and Endogenous Development in Low-Density Territories *51-61*

v. Fellows
vi. Auxiliary Memberships
vii. Preferred Author Guidelines
viii. Index

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Enhancing Employability for Autistic Graduates: Using TRIZ Theory to Design Virtual Reality Solutions for Fostering Inclusive Communications in Workplace Environments

By Jonathan Proulx Guimond, Jocelyne Kiss , Reyes Consuelo, Miguel Alejandro, Dominique Michaud, Rency Inson Michel, Alexandre Ménard, Isabelle Feillou, Geoffreyjen Edwards, James Huston, Claude Vincent, Ruel, Julie, Sylvain Letscher, Psyché, V.aléry, Cathia Papi & Caouette, Martin

Laval University

Abstract- The underemployment of post-secondary graduates with autism (AP-PSD) is a critical concern. This issue often stems from difficulties in workplace integration and communication. This research explores the potential of virtual reality (VR) systems to alleviate these challenges by simulating work environments. The methodology, rooted in the TRIZ Theory, a problem-solving algorithm, refines the use of VR systems for enhanced adaptability and efficiency. The primary objectives include enhancing employers' understanding of AP-PSD-related issues and identifying significant workplace challenges faced by AP-PSDs. Through literature reviews, surveys, and focus groups, the study investigates the factors impacting AP-PSDs and identifies key components to develop a more effective VR system to support their workplace integration.

Keywords: autism employment, virtual reality (VR), workplace integration, emotion recognition, technological adaptations.

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ENHANCINGEMPLOYABILITYFORAUTISTICGRADUATESUSINGTRIZTHEORYTODESIGNVIRTUALREALITYSOLUTIONSFORFOSTERINGINCLUSIVECOMMUNICATIONSINWORKPLACEENVIRONMENTS

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Enhancing Employability for Autistic Graduates: Using TRIZ Theory to Design Virtual Reality Solutions for Fostering Inclusive Communications in Workplace Environments

Jonathan Proulx Guimond [α], Jocelyne Kiss [σ], Reyes Consuelo, Miguel Alejandro [ρ], Dominique Michaud [ω], Rency Inson Michel [¥], Alexandre Ménard [§], Isabelle Feillou [χ], Geoffreyjen Edwards [ν], James Huston [θ], Claude Vincent [ζ] Ruel, Julie [£], Sylvain Letscher [€], Psyché, V.aléry [₣], Cathia Papi [₴] & Caouette, Martin [₳]

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Keywords: autism employment, virtual reality (VR), workplace integration, emotion recognition, technological adaptations.

Author α σ ρ ω ¥ § χ ν ζ: Laval University, CIRRIS, QC Canada.
e-mails: jonathan.proulx-guimond.1@ulaval.ca, jocelyne.kiss@design.ulaval.ca, miguel-alejandro.reyes-consuelo.1@ulaval.ca, dominique.michaud.1@ulaval.ca, rency-inson.michel.1@ulaval.ca, alexandre.menard.5@ulaval.ca, isabelle.feillou@rlt.ulaval.ca, gedwoods2002@yahoo.it, claude.vincent@rea.ulaval.ca
Author θ: Lindenwood University, USA.
e-mail: jhutson@lindenwood.edu
Author £: Institut universitaire en DI et TSA. e-mail: julie.ruel@uqo.ca
Author €: Université du Québec à Rimouski, QC Canada.
e-mail: sylvain_letscher@uqar.ca
Author ₣ ₴: TELUQ University, QC Canada.
e-mails: Valery.Psyche@teluq.ca, Cathia.Papi@teluq.ca
Author ₳: University of Quebec at Trois-Rivières, QC Canada.
e-mail: martin.caouette1@uqtr.ca

I. Introduction

Recent studies estimate that 85% of people with autism with a post-secondary degree in the United States are unemployed (Baker-Ericzén et al., 2022), and 86% in Canada (Lawson et al., 2020). This work explores technological and human approaches to adapt the workplace for autistic individuals, promoting their access to employment. By highlighting the advantages and challenges of workplace adaptation, the following aims to address the high unemployment rate among Autistic Persons with a post-secondary diploma (AP-PSD). Autism is characterized by atypical neural development, resulting in pervasive behavioral symptoms (Tevis et al., 2022). Autistic individuals often have specific interests and repetitive behaviors, impacting their ability to interact emotionally in a socially adequate way (Zhan, 2014). These manifestations frequently affect communication and social interactions (Muskett, 2016). A diverse range of autism manifestations (McCormick, 2020) cautions against categorization processes, as these can change for each individual. Manifestations may change according to situations, context, and factors that are often difficult to identify (Faras, 2010). Misinterpretations have arisen from erroneous naming and categorization (Anderson-Chavarria, 2022), and media representations often perpetuate stereotypes.

Many AP-PSD struggle with workplace integration due to insufficient adaptations and employers' lack of understanding regarding their specific needs (Corneille et al., 2019). Despite common misconceptions about autistic individuals preferring routine, our hypothesis is that AP-PSD also seeks to find a workplace where their skills would be recognized, and if possible, where their specific center of interests could

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be useful (Wilczynski et al., 2013). The demonstration will underscore the critical necessity of acknowledging individual requirements for AP-PSDs to facilitate their workplace integration. It is important to understand that AP-PSDs may need different considerations and adaptations to feel assimilated in their workplace. However, pinpointing these specific needs is not always straightforward (Wilczynski et al., 2013). One must take into account that employers could lack a complete understanding of their employees identified as AP-PSDs. This lack of knowledge may stem from various causes such as privacy regulations, undiagnosed autism, or reluctance from the employees themselves to share their condition due to apprehensions about stigmatization or discrimination (Huang et al., 2022; Attwood, 2019). Existing methods of workplace modification, such as 'pattern matching techniques' which involve finding precise solutions for clearly identified problems (Vujica Herzog, 2020), might not be effective for AP-PSD, given the varied expressions of autism (Harmuth et al., 2018; Syvan, 2019). Appropriately customizing workplace inclusion strategies can positively influence both the company's progress and the life quality of all employees (Neihart, 2000; Tompa et al., 2022). A prospective strategy to manage these challenges might involve the application of technology.

It has been found that technology could facilitate workplace adaptation for AP-PSD under certain conditions, such as not having learning difficulties (Kungratovich, 2020). This work explores the potential remote assistance devices to complement integration and support measures, recruitment, in-company training, and maintain AP-PSD in employment. In this context, we are looking at producing a prototype that could include human and technological systems in order to provide alternative support to accommodate both the needs of AP-PSD and the employer (Agamben, 2006; 2014). The hypothesis is based on the idea that simulating the work environment and social interactions can help anticipate challenges for AP-PSD and prepare them to handle these situations effectively. At the same time, employers along with employees must be considered when developing a support system.

The challenge in supporting AP-PSD in the workplace lies in the necessary anticipation and preparation of the AP-PSD, managers, other employees, and the environment. The time dedicated to understanding the system and its processes can be beneficial for AP-PSD, as it enables them to incorporate these elements into their routine once they comprehend the requirements and limitations (Cockayne, 2019). However, the emotional components of communication between managers and AP-PSD can cause confusion and pose as hindrances (Chaidi & Drigas, 2022; McKnight-Lizotte, 2018). Hence, a significant challenge is clarifying the emotional context of these interactions. Although inclusive or social enterprises have progressed in integrating AP-PSD through diversity policies (Vidal, 2005), additional preparatory stages are required for AP-PSD (Khalifa, 2020; Lindsay et al., 2021). Bonete (2015) highlights the advantages of collective training experiences for AP-PSD and other staff members in comprehending and addressing interpersonal issues in social settings, underlining the need for preemptive understanding of situations to encourage acceptance and integration.

In order to address these considerations to support the population, this project utilizes a co-design approach to create virtual reality simulations of work environments, allowing for adjustments based on system feedback while acknowledging the perspectives and limitations of the proposal (Kenny et al., 2016). The aim of the project was to develop a technological and human solution to promote the integration of AP-PSD into the workforce, primarily for remote use, such as during confinement. To address this problem, this research proposes to design using TRIZ algorithm and VR support system, a prototype that replicates the workplace environment, providing a platform for AP-PSD to anticipate and overcome potential difficulties, master job-specific tasks, and ensure emotional stability. Therefore, it conceptualizes a system that provides a virtual reproduction of the workplace to progressively accommodate employer expectations. The system identifies potential challenges for an individual, anticipates situations, and allows for practice of tasks and procedures required by their job, while ensuring the emotional stability of the user through feedback.

II. Literature Review

a) Context

The employee shortage in Canada threatens the economic growth of companies and the country and is unlikely to be a temporary situation (Cocolakis-Wormstall, 2018; Komarnicki, 2012). As a result, employers are adopting unconventional measures to address the workforce shortage, leading to a growing interest in integrating individuals with disabilities into the workforce (Vornholt, 2018). Government policies, such as Quebec's Full Policy and the United States' Americans with Disabilities Act, also encourage the employability of people with disabilities (DeLeire, 2000). Currently, 1 in 40 children is an AP-PSD, and 44% of them have average or above-average intelligence (Deloitte, 2012). However, the employment rate for AP-PSD remains low compared to the general population (Howlin, 2013). Although there has been some improvement with the employment rate for AP-PSD rising to 33% in 2017 (Delman, 2017), the integration of neurodiverse individuals into the workforce remains a challenge due to obstacles and non-standard behaviors (Moriña, 2022). Despite concerted efforts, as highlighted

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in the introduction, the employment rate for AP-PSD continues to be disappointingly low. Misconceptions and adverse perceptions often lead to the underestimation of the work capabilities of AP-PSD (Van Wieren, 2008). Consequently, numerous individuals with disabilities, including AP-PSD, may become disheartened about joining the workforce following unsuccessful employment experiences, even though there exists a robust desire for employment, as observed in 77% of the population in the United Kingdom (Cope & Remington, 2022).

III. Hiring Process

a) Integration Process

Companies face challenges when integrating autistic persons with psycho-social disabilities (AP-PSDs) into the workplace, as the integration process is crucial for developing a sense of inclusion (Molloy, 2022). This sense of inclusion develops through a dynamic identity construction process, allowing individuals to identify with one another (Fournier, 2011). Successful integration creates lasting benchmarks and helps employees understand their tasks. AP-PSDs often need a more explicit form of communication to navigate implicit psychological contracts between employers and employees (Conway, 2005; Scott, 2015). Although AP-PSDs are typically supported by human resources managers (Estes, 2008), their diagnosis may not always be known by the employer, leading them to follow the same integration process as other employees. This highlights the need for specific preparation to ensure successful AP-PSD integration. The standard company integration process often relies on an employee's adaptability and ability to grasp employer expectations implicitly (Zula & Chermack, 2007). However, this approach can be counterproductive for AP-PSDs who experience social anxiety (Bejerot et al., 2014) or struggle with small talk (Walsh, 2007). While inclusion integration processes can be beneficial in developing feelings of integration and leadership (Ferdman, 2013; Offermann & Basford, 2013), they may not be universally applicable for AP-PSDs (Smith, 2011). Adapting these processes and considering environmental and social specificities is crucial for successful AP-PSD integration (Parr et al., 2013). The role of colleagues in the adaptation process is crucial (Longmire & Taylor, 2022), and it's imperative to acknowledge the necessity of managing individuals in diverse ways to achieve harmonious team cohesion (Hagner & Cooney, 2005).

b) Job Retention Process and Emotional Well-Being

The COVID-19 health crisis provided an opportunity to study the effects of work changes on AP-PSDs, such as job loss, changing hours, and modalities (Galea, 2016; Taylor, 2022). These studies highlighted the importance of emotional stability in the workplace for AP-PSDs to maintain employees (Goldfarb, 2021b). The pandemic also accelerated the use of online platforms for work and training, sparking discussions about the inclusivity of these platforms for individuals with disabilities, including AP-PSDs (Peñarrubia-Lozano, 2021). Researchers are now exploring virtual interfaces and devices to create more effective training environments and integration, not only during confinement but as a new standard in the workplace (Mpofu, 2022). Designing these environments necessitates considering the specific communication modalities for AP-PSDs (Goggin, 2021). AP-PSDs encounter challenges with unplanned social encounters, like informal dialogues or communal dining in a cafeteria, due to their unpredictable nature and certain environmental elements (Grandin, 2009a). Aspects like illumination, noise levels, and closeness can induce stress. Employers can facilitate conditions for AP-PSDs by providing straightforward adjustments, like noise-dampening headphones, gloves, special glasses, or a designated private space for solitude as required. However, safety should always be considered when implementing these measures. Modifying the surroundings to accommodate the needs of an AP-PSD can diminish their sense of exhaustion and enhance their overall quality of life. Raising employer awareness about the inherent qualities of AP-PSDs and the need for a suitable work environment is essential for their successful hiring, integration, job retention and improved overall AP-PSD's quality of life (Leaf, 2022; Nicholas, 2018). Companies like J.P. Morgan Chase have devoted resources to accommodate AP-PSDs and reported increased productivity from these employees. Effective training should address both task execution and social behavior, such as addressing team members, adhering to dress codes, and maintaining hygiene (Bogdashina, 2022; Van Haasteren, 2011; Wolf, 2009). Providing clear instructions and expectations can promote employee comfort and retention (Schall, 2010), and allowing AP-PSDs to self-correct and self-regulate can enhance their sense of competency (Asaro-Saddler, 2016). However, it is the employer's responsibility to implement this type of training to achieve economic objectives, as the school system is currently not equipped to support the transition to employment for AP-PSDs (Ballantyne, 2022; Findley, 2022), nor to understand fully the requirements for AP-PSD emotional health in the workplace environment.

The aforementioned research underscores the distinctive obstacles encountered by AP-PSDs in the professional environment, spanning from recruitment processes, integration phases, to everyday communications. Employers can better support AP-PSDs by adapting recruitment processes, creating inclusive onboarding programs, and offering tailored accommodations. Implementing clear communication, providing structured tasks, and utilizing technology such as VR simulations can significantly improve the

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experiences and productivity for this population. Promoting a more inclusive workplace environment serves to benefit AP-PSDs while also encouraging diversity and sparking innovation within the organization. It is essential for future studies to persist in uncovering effective strategies and workplace adjustments, aiming to bolster the seamless professional integration and overall well-being of AP-PSDs.

The use of virtual reality (VR) as a training tool for specific situations and tasks is increasingly recognized as a solution to adapt the work environment for AP-PSDs. However, finding a sustainable solution to effectively integrate AP-PSDs into their work environments remains a challenge. Based on our review of the literature, it is evident that the main obstacle for AP-PSDs is their emotional well-being in the workplace, which significantly impacts their successful integration in the short, medium, and long term. While implementing environmental adjustments and providing training to help AP-PSDs navigate these challenges is an initial step, further exploration is needed to address the broader issue. However, using Virtual Reality (VR) solely as a repetition tool may not directly address the fundamental issue of workplace well-being for AP-PSDs. It is crucial to ensure that employers have a comprehensive understanding of their employees' situations in order to appropriately adapt the work environment. However, given the communication challenges faced by AP-PSDs, accurately grasping their emotional well-being remains a significant challenge. In this study, our hypothesis is that VR systems, leveraging advancements in information technologies, can serve as effective communication tools to explicitly convey signs of distress in the workplace for AP-PSDs and help employers better understand their needs. Building upon this premise, our research aims to explore whether VR systems can provide means to enhance the understanding of factors that affect the emotional well-being of AP-PSDs in the workplace.

IV. Methodology

The central premise of this study rests on the possibility of employing an information processing system to analyze data associated with emotional health. The system's objective is to present these insights in a manner that is easily understandable and interpretable by a user. Indeed, an enhanced VR system should be able to grab specific situations so that the employer could understand and then provide adequate adaptation. The applied methodology enables the amendment of a system that also incorporates human emotional elements (Yu, et al. 2023). It is worth noting that our methodology combines elements of system analysis with interdisciplinary approaches, allowing us to incorporate both systematic rigor and considerations of human communication dynamics into the development of our prototype. To achieve this, we employed the TRIZ Theory algorithm, also known as Inventive Problem-Solving Theory, which enabled us to refine an existing system and propose innovative solutions to address the identified problem. Our primary objectives were: 1) enhancing employers' understanding of autism-related issues; 2) identifying key challenges faced by individuals with autism in the workplace; 3) examining the contextual factors influencing AP-PSDs in their work environment; 4) exploring technological adaptations to support situation recognition, communication, and understanding; and 5) discussing strategies to improve support for employees with autism. Our methodology encompassed the following steps:

1. Identify the problem in its context (Objective 1)
2. Setting up a list of the requirements, needs (Objective 2),
3. Using functional analysis processes, juxtaposing ideal user's outcome with system description and its contradictions (Objective 2 and 3)
4. Applying the technical and physical contradictions matrix to identify potential solutions (Objective 4)
5. Identify objectives and refining the formulation of the problem (Objective 4)
6. Trim the parts that could not be address (Objective 4)
7. Implement the solution (Objective 4)

Please note that Objective 5, which focuses on discussing the improvement of support for employees with autism, is not directly addressed within the TRIZ Theory algorithm. Instead, it represents additional considerations and perspectives that emerged during the development of our prototype.

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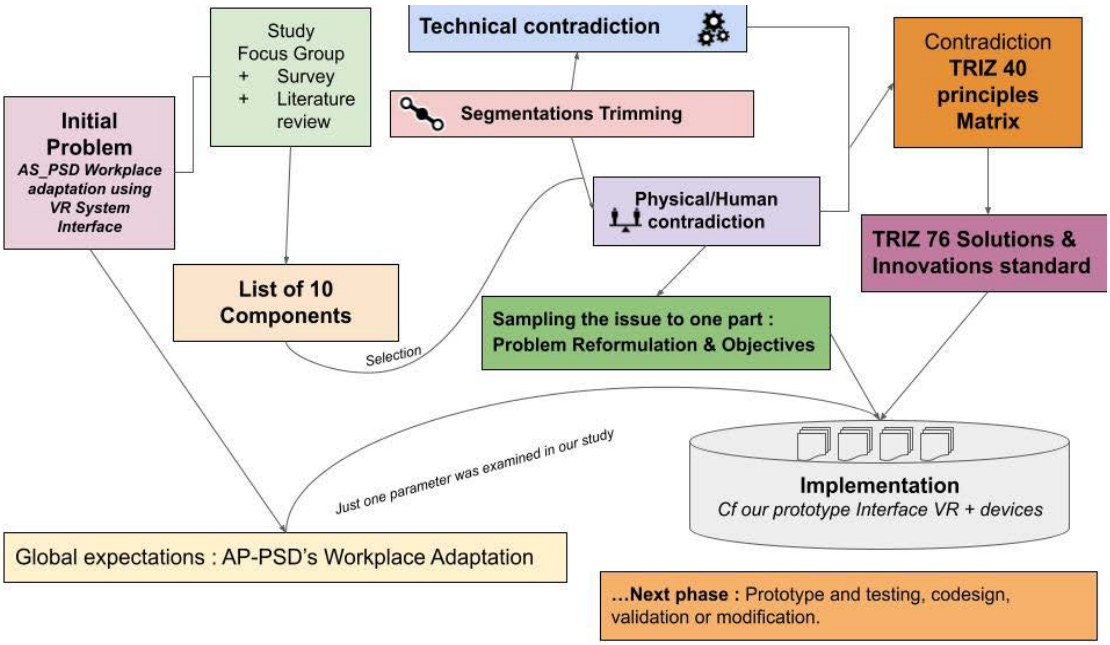


Figure 1: Triz Algorithm application to our study

1. Identify the problem in its specific context of the use of the system

A mixed-method approach was employed to examine the context of employment situations for individuals with autism spectrum disorder (AP-PSD) and identify factors that could generate discomfort or facilitate their integration in the workplace, such as: 1- an ergonomic study was specifically led with an inclusive company that is already welcoming employees living with autism that we will not present here in details, as it will be part of an other work; 2- an online survey that involved corporate representatives from the L'Expertise network, students with a disability in the Quebec, Montreal and Sherbrooke areas, was launched regarding the employability situation of post-secondary students living with a disability, 3- testimonials were collected from managers (n=4) and guides who work or have worked with AP-PSDs, and a Focus Group (n=9) was conducted to generate insights on the challenges faced by these individuals. The Focus Group was composed of corporate and human resources representatives that were already promoting AP-PSD inclusion at the workplace, as well as representatives of the Quebec Association for Equity and Inclusion in Post-secondary Education (AQEIPS) that promotes inclusion of all students living with disabilities. Objective 4 involved conducting a literature review to explore possible accommodations and modifications that could enhance the work environment for AP-PSDs. The specific methods and results from the survey and focus group are not discussed in this section. However, the findings from these data sources, along with the emergent themes identified in the literature review, informed the subsequent stages of the research process.

The purpose of the literature review was to explore potential accommodations and modifications that could improve the workplace environment for AP-PSDs. However, the original plan to generate a comprehensive list of needs through the Focus Group did not materialize as intended. Initially, the methodology involved creating categories based on different types of causes related to challenging situations faced by individuals with autism (AP-PSD), with input from human resources managers. These categories were then meant to be replicated in a virtual environment, with potential accommodations suggested. However, it became apparent that strict categorization alone was not sufficient to capture all the issues experienced by AP-PSDs, as we will discuss in the subsequent section.

2. Producing a list of the requirements (needs)

This section aims to outline the user's needs and requirements that have emerged from the previous phase, which included the Focus Group discussions and the literature review. These findings will help us define our objectives and guide the design and development of our prototype, following the principles recommended by TRIZ and other system analysis approaches. The initial step will involve identifying the expectations and specific requirements related to the utilization of a VR system for adapting to the workplace environment.

The first requirement is to avoid using rigid categorizations when designing a comprehensive solution for employers. It is crucial to acknowledge that each individual with autism (AP-PSD) may have unique sensitivities and challenges. For example, researchers have observed that some AP-PSDs may be

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hypersensitive to certain types of light, and potential solutions like glasses or filters have been considered. Additionally, providing a peaceful space for rest during the day has been proposed for individuals with auditory processing disorders. However, it is important to recognize that these circumstances and solutions cannot be universally applied to all AP-PSDs. Moreover, the same specific situation can be experienced differently by an AP-PSD, as it is influenced by individual factors that are difficult to generalize, even within the same context. Therefore, a personalized and individualized approach is necessary to address workplace situations for AP-PSDs.

This realization challenged the initial proposal of addressing predetermined factors, as the behavior, emotions, and decision-making of individuals with autism spectrum disorder (AP-PSDs) cannot be fully predicted (Robic et al., 2015). The dynamic nature of the workplace, which involves interactions with colleagues, clients, and external elements, often leads to unpredictable situations. AP-PSDs encounter difficulties in preparing for such situations in advance due to the inherent unpredictability of social interactions (Gomot & Wicker, 2012). Simply understanding the physical workspace may not sufficiently address the personal experiences that impact AP-PSDs in their daily work. Vanacker (2021) suggests the importance of "predicting the unpredictable," which necessitates comprehensive training to help AP-PSDs feel comfortable across diverse scenarios. Several conditions emerged consistently during focus group discussions as crucial factors for promoting integration and well-being of AP-PSDs in the workplace. These include:

1. Presenting content visually and in writing;
2. Prioritizing context-linked content presentation (photos, videos) and avoiding abstract explanations;
3. Providing a calm environment;
4. Offering assistance to adapt AP-PSD's schedules, noise and light levels, and communicate their issues;
5. Defining task execution limits: time, place, and degree of perfection;
6. Ensuring good understanding of content and involving AP-PSDs in the explanation process;
7. Validating each step of the explanation;
8. Giving equal importance to soft skills instructions;
9. Linking the person's interests with their workload;
10. Continuously considering AP-PSD's well-being, perception, and emotional state during task execution (mental load and work-related stress levels).

This compilation of conditions serves as an initial step and forms the foundation for creating an inclusive and supportive workplace environment for individuals with autism spectrum disorder (AP-PSDs).

3. Juxtaposing ideal user's vision of use of VR system and its contradiction

The categorization method proves valuable in implementing immediate fixes and promoting workplace comfort by addressing specific environmental or procedural issues (Zhi et al., 2021; Attwood, 2019). However, it is essential to recognize that the expectations for our system extend beyond these adaptations alone. Consequently, this work begins by presenting a list of categorized situations that may present challenges for AP-PSDs in the workplace. However, it is crucial to emphasize the importance of adopting an individualized emotional approach rather than relying solely on these categories. The findings from our focus group study highlight the impossibility of adopting a universal approach to environmental adaptation as observed behaviors only capture a fraction of AP-PSDs' experiences. The focus group underscored the need for a tool that can effectively communicate situations, sensations, and emotions that may not be easily verbalized. Both human resources managers and AP-PSDs themselves emphasized the necessity of evaluating the emotional states of AP-PSDs in the workplace to enhance mutual understanding and improve their relationship dynamics. VR systems, in their current form, do not possess these features. Thus, the following section will outline our approach to addressing this gap and meeting the expectations of the focus group. Following the algorithm, we identified a contradiction: the inability of the current VR system to effectively communicate the implicit features necessary for a better understanding of AP-PSDs, despite its potential to enhance work productivity through real-time multisensory display of information.

4. Applying the technical and physical contradictions matrix to identify potential solutions

TRIZ offers various approaches, one of which involves utilizing the 40 principles Matrix (Kumar, 2005) to resolve contradictions that point towards existing solutions. In our specific case, the findings from the Focus Group highlight the primary challenge of effectively communicating internal states, as the interlocutor often struggles to understand the situation. Thus, for the TRIZ Matrix, the input includes identifying the loss of information as the element we aim to improve, while maintaining productivity as the overarching goal of the workplace.

The Matrix presents three principle solutions: 1) Feedback, 2) Dynamics, and 3) The Other Way Round. It is important to note that TRIZ supports creativity by guiding the designer in finding the appropriate processes and tools to implement these principles and reach a solution.

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40 Principles Matrix	Parameters	Solutions
What should be Improved?	*Loss of Information*	*1-The Other Way round : 2-Feedback 3- Dynamics*
What Should be Preserved ?	*Productivity*	

Matrix elected 3 principles regarding our contradiction entries summarized here:

1. Principle # 13- The Other Way round: Invert the action(s) used to solve the problem.
2. Principle #23- Feedback: If feedback is already used, change its magnitude or influence (Change a management measure).
3. Principle #15- Dynamics: Design to find an optimal operating condition. Such as, Divide an object into parts capable of movement relative to each other.

The orientations chosen based on these results shall now be discussed. One relevant principle that emerged is the concept of inverting the action. Typically, the responsibility for adapting the workplace environment for AP-PSDs lies with the employer or designer. However, the solution principle suggests that the action should come from the opposite side, with the receiver of the adaptation taking the lead. In this case, it means that the AP-PSD should be the one driving the adaptation process.

Another principle, Principle #13, highlights the importance of information coming from the other way round. In this context, it means that information about the emotional state should come from the AP-PSD themselves. This principle guides the provision of instructions and feedback to the AP-PSD employee through the use of a VR system.

The Feedback principle suggests that obtaining missing information can be achieved through specific measurements tailored to the user's needs. In this case, measuring physiological signals related to well-being, such as levels of relaxation, cognitive load, and indicators of social well-being, appears to be a promising avenue to explore. It is crucial to emphasize the principle of reciprocity, where both parties actively engage in measuring and understanding these physical indicators. This allows for a comprehensive understanding of the emotional context from different perspectives, enhancing the overall effectiveness of the system.

Technologically, this led to the identification of devices for measuring relevant signals, which would be displayed on a dashboard accessible to both the employee and the employer. The interpretation of these signals would be provided, along with a protocol to facilitate effective communication and maintain productivity.

Considering the results from the Focus Groups, it became evident that identifying the AP-PSD's center of interests could be key in fostering a stronger connection between the individual and the workplace. Ideally, establishing a direct link between the AP-PSD's interests and their work tasks would be the optimal approach, whenever feasible.

5. Identify objectives and refining the formulation of the problem

According to the TRIZ methodology, it is crucial to redefine the problem and objectives at this stage of the process. In our case, we considered whether a VR interface could serve as a means to effectively engage both the employee and the employer representative, facilitating the visual sharing of typically implicit emotional states.

With this in mind, we established three specific objectives for implementation:

1. Designing a VR context that leads AP-PSD to be able to assess what could be provided more comfort at work.
2. Proving a suggested protocol to enhance online collaboration and meaningful exchange
3. Interpreting visually in real time in the VR Interface the emotional state of both interlocutors to improve mutual understanding.

Consequently, this study proposes a real-time virtual reality interface (RTVR) that allows exploration of a workplace, training with feedback on practical tasks or social relationships, and self-assessment of stress and cognitive load using biometric measurements. The tool under review can potentially help both AP-PSDs and human resources managers understand and address challenges as they arise, but further research is needed to prove its utility for users.

The study integrated an individualized approach in the application while acknowledging the limitations in addressing certain communication modalities. Using alternate realities to describe concrete physical universes helps explain situations that may be difficult for AP-PSDs to grasp by providing more explicit and visual information (Cohn, 2019; Shane et al., 2012; Pijnacker et al., 2009). Although this type of alternate reality device may not be suitable for everyone, it is hoped that this study paves the way for future research to ensure a more inclusive workplace for AP-PSDs.

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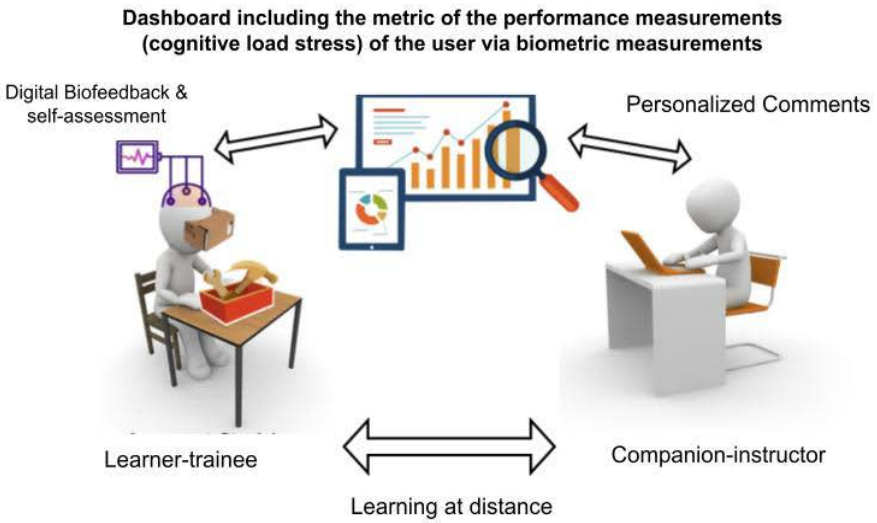


Figure 2: Space for companion-student exchanges

6. Trimming the parts that we could not be address, as opportunity for further studies

Applying the TRIZ Algorithm led to the selection of a specific contradiction to focus on, in line with the principles of the methodology. This decision does not diminish the consideration given to other aspects of the Focus Group results, nor does it imply that only one contradiction was identified. Rather, it reflects the intention to target a specific area for improvement within the broader context of AP-PSD workplace adaptation. It is important to acknowledge that the proposed design does not claim to provide a comprehensive solution for all challenges faced by AP-PSDs in the workplace. However, it aims to address a significant aspect of their well-being by addressing the communication of their emotional health through the utilization of existing solutions and methods.

7. Implement the solution: Results

The results of this study reveal that using concrete representations through interactive videos (https://www.criv.online/impulsion-frqsc) or representations of places, people, and explicit descriptions of expectations can facilitate the communication and understanding of work tasks for AP-PSDs. The interview questions in the interface focus on validating the processes that the AP-PSD has already carried out beforehand, with open questions reduced to a minimum in favor of interactive actions.

The results of the study involve providing free access to a virtual building, allowing the person with AP-PSD to explore at their own pace and become familiar with their daily routine before meeting their attendant. The attendant initially appears as an avatar and later transitions to a videoconference format. Similarly, other employees are not present at the beginning but are gradually introduced as avatar-bots with pre-recorded behaviors based on their tasks.

Virtual spaces offer significant advantages for AP-PSDs, as they provide well-defined frameworks that explicitly describe situations, allow multiple attempts without the risk of judgment, and filter out potentially intrusive elements such as emotions and physical contact. This approach creates a supportive environment for AP-PSDs to familiarize themselves with their workplace and develop a better understanding of their tasks and social interactions.

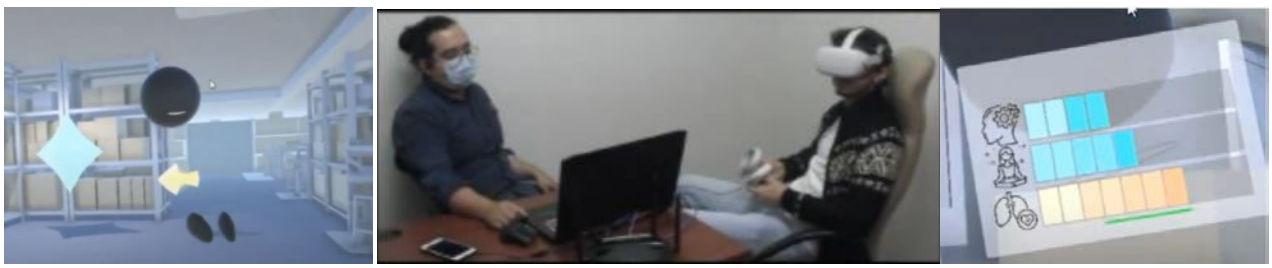


Figure 3: a-VR Interfaces with bots, b-assistance during session and c-Stress level and emotional stability during task performance (Show progress bars that visualize biometric measurements)

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Furthermore, the virtual environment allows the person with AP-PSD to observe their own actions and self-correct. Saade (2021) found that interactions during online training for AP-PSDs enhance their inclusion capacity and promote self-evaluation and self-correction of their productivity. Generally, well-supervised online teaching appears promising for AP-PSD training (Taslibeyaz et al., 2022). In recent years, human and technological assistance devices have emerged (Wali & Sanfilippo, 2019), demonstrating that digital environments, under certain conditions, present exciting prospects for AP-PSDs in the workplace (Tomczak, 2021). In the upcoming sections, the paper will provide illustrative examples of some of these conditions. It is crucial to consider that AP-PSDs often experience significant stress when confronted with new situations, particularly when they cannot relate them to previously learned categories. Offering clarity and reducing ambiguity is essential for reducing stress levels, which in turn contributes to the retention of trained individuals within the company. This sense of comfort is also beneficial for other staff members who have expectations regarding appropriate behavior. The paper will discuss the integration of learning and anticipation processes into a dedicated virtual simulation that closely replicates the work environment and interactions. This simulation enables individuals to immerse themselves in a safe space, allowing them to project themselves into future situations and better prepare for them. While the usability and potential effectiveness of this VR interface will be explored in a separate study, the paper will examine the limitations and possibilities of this approach in the subsequent sections. These findings have the potential to provide new insights into the situations experienced by both AP-PSDs and those in their immediate surroundings.

Discussing one's perception of stress in the workplace is often uncommon due to various reasons, and it can be viewed as a sign of weakness or complaint (Correia Leal et al., 2020). Autistic individuals, including AP-PSDs, may be inclined to overcome stress rather than explicitly verbalize their stress levels. However, excessive stress can lead to issues such as increased absenteeism or even resignation. To address this, we incorporated measures within a VR interface to assist autistic employees in becoming more aware of their stress levels, mental load, and the quality of their social interactions (Seok, 2022). These measures can be utilized at the discretion of the individual, allowing them the option to share this information with their manager or keep it private. It is important to note that there are potential challenges associated with using these measures, as an individual may already be experiencing stress before work or have a naturally high level of relaxation. To mitigate these challenges, our methodology involves consistently recording biometric data and comparing the differences observed in stressful situations, thereby establishing a unique stress signature for each individual. If the user grants their manager access to this information, it may assist the manager in adapting their requests and communication methods accordingly (Grandin, 2009b).

AP-PSDs' strong points and weaknesses lie in their "center of interests" (Goldfarb, 2021). When their job aligns with their passions, retention is more likely. However, this is not always possible, and there are challenges in retaining employees without this alignment. Social activities, such as celebrating birthdays, can be distressing for AP-PSDs (Bader & Fuchs, 2022), even though they promote belonging for neurotypical employees (Waller, 2020). It is important to balance social interactions for AP-PSDs, as proper introduction can bring well-being. HR managers should maintain efforts to make AP-PSDs feel comfortable and understand the expectations of social events. Technological tools, like those developed by Vanderbilt University School of Engineering, can help employers, employees, and autistic individuals better understand and adapt their behavior in social environments.

V. Discussion

In all, planning can significantly improve executive functions and anticipation for AP-PSDs, favoring their integration into the work environment (Wallace et al., 2016). It can also help alleviate stress linked to workplace integration (Wallot, 2021). Although there are limitations to anticipatory activities (Angus, 2015), using alternate reality devices to simulate situations has proven to be a relevant process for AP-PSDs (Wainer & Ingersoll, 2011), provided they receive proper human support (Glaser & Schmidt, 2022). These devices are tools that cannot replace managerial supervision but offer a secure context for practice (Brosnan & Gavin, 2015) and remote monitoring when necessary. The main objective of a virtual environment is to reduce stress from unknown situations, establish mutual trust, promote exchanges, inculcate expected behaviors, and identify AP-PSDs' strengths and interests (Giaconi et al., 2021). However, it is essential to consider certain points to better understand the limits of such a system when creating a virtual work environment for AP-PSDs.

Finally, it is crucial to recognize that AP-PSDs do not react in the same way as neurotypicals (Nicholas et al., 2019). While virtual environments can help simulate situations for AP-PSDs, they are not realistic enough to authentically replicate social situations. It is recommended to have a live human companion connected within the interface (Zhang et al., 2018), as using bots cannot fully replace human presence. The same person should also provide support in real-life situations to ensure consistency and adherence to social codes (Parsons et al., 2005). Gradually

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introducing learned behaviors from the virtual mode into real situations can help generalize these behaviors (Almurashi et al., 2022). Further exploration of augmented reality's potential in work integration contexts for AP-PSDs could provide valuable insights for future advancements.

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The study was approved by the Research Ethics Committee of the Integrated University Health and Social Services Centrede la Capitale-Nationale (2022-2429- RIS_) and informed consent was obtained from all participants. This study was conducted in accordance with the Declaration of Helsinki.

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The Role Played by Zen “Kong” in Japanese Aesthetics

By Yuxi YI
Fudan University

Abstract- Japanese Zen Buddhism has led the way for Japanese aesthetics and has continued to bring this aesthetic to the public, most notably in the form of ukiyo-e. Zen Buddhism is a branch of Buddhism with the core principle of "no thought, no appearance, no dwelling," and "Katsu" as its practice from Linji School. As Zen became integrated into Japanese life, meditation was likewise manifested in social life, most notably in the Edo period. As a declining, last feudal period in Japanese history, the Edo Shogunate was flawed in terms of notification. The samurai class, which was attached to the Shogunate, was fundamentally lacking in subject matter, and the Tokugawa family gave them the idea of Bushido but not its inner pillar. Japanese merchants, who had no status, spent their money recklessly but gained confusion and emptiness. Bijinga-e, who specializes in painting Japanese geisha in Ukiyo-e, shows all the meanings of "Kong" through the composition, white space, and the form of people in the painting. Most impressionists in the nineteenth century expressed their emotions and imitated East Asian style artworks, and only "had the form but not the spirit." This paper thus concludes that the status of "Kong" in Japanese Zen aesthetics is like a butterfly in an invisible net, out of control and out of sight.

Keywords: “kong”, bijinga-e, zen, japanese aesthetics.

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The Role Played by Zen “Kong” in Japanese Aesthetics

A Case Study of "Kong" in the Bijinga-e and the Post-Impressionism Imitation Forms

Yuxi YI

Abstract- Japanese Zen Buddhism has led the way for Japanese aesthetics and has continued to bring this aesthetic to the public, most notably in the form of ukiyo-e. Zen Buddhism is a branch of Buddhism with the core principle of "no thought, no appearance, no dwelling," and "Katsu" as its practice from Linji School. As Zen became integrated into Japanese life, meditation was likewise manifested in social life, most notably in the Edo period. As a declining, last feudal period in Japanese history, the Edo Shogunate was flawed in terms of notification. The samurai class, which was attached to the Shogunate, was fundamentally lacking in subject matter, and the Tokugawa family gave them the idea of Bushido but not its inner pillar. Japanese merchants, who had no status, spent their money recklessly but gained confusion and emptiness. Bijinga-e, who specializes in painting Japanese geisha in Ukiyo-e, shows all the meanings of "Kong" through the composition, white space, and the form of people in the painting. Most impressionists in the nineteenth century expressed their emotions and imitated East Asian style artworks, and only "had the form but not the spirit." This paper thus concludes that the status of "Kong" in Japanese Zen aesthetics is like a butterfly in an invisible net, out of control and out of sight.

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I. Introduction

Nowadays, the world order is chaotic, the world pattern is fluid, and new possibilities can arise every day. The sense of crisis brought about by the new coronavirus puts people in fear of being threatened by death every day. The British exit from the European Union (Brexit) and the war between Russia and Ukraine make it impossible to return to the complete peace of the past in a short period. There are growing sea levels, melting glaciers, dwindling trees on the planet, and species going extinct with dramatically changing biodiversity. Each of those crises acts as a threat, which makes it impossible for us to rely solely on ourselves for survival. As a result, people are looking for spiritual support, some for their love of country, some for God, and others for a simple, "empty" state of existence.

Such an era stimulated the consciousness of question and the desire to continue my exploration of the aesthetics of Japanese Zen art based on the article An Analysis of the Status of Japanese Zen Art Aesthetics in Ukiyo-e: From Katsushika Hokusai, the famous painter in the formation of Ukiyo-e, to Van Gogh. In my previous paper, we opened the door to the desire to explore the aesthetics of Japanese Zen art. According to the previous article, we opened up with a hot topic, namely the specific relationship between Japanese Zen art aesthetics and ukiyo-e, to understand the dominant and driving position of Zen thought as deified philosophy in ukiyo-e by analyzing the normative style, painting form, painting content, and structural lines of Hokusai ukiyo-e paintings. This paper hopes to delve into the question of what ideas and ideologies in Zen Buddhism dominated the Japanese artistic aesthetic. How was this aesthetic art articulated through the Ukiyo-e that flourished in the Edo period? This paper holds that this subjectivity, in essence, can be understood as the Zen empty ideology. This idea of Kong drives human beings to express their abilities, roles, perceptions, and status through artistic expression in the practice process, demonstrating the form and spirit of this artistic aesthetic through autonomous, purposeful, and dynamic activities.

I have to clarify the use of the word "空（written as “Kong”）"before we begin talking about its position. In contemporary society, there are many expressions of Kong. When it is widely used in the aesthetic concept of fashion and residential furnishing style, it often has a similar meaning to "sunyata" and "sabi," expressing the normalization of white space, nothingness, and silence. Due to the fact that the Kyoto school incorporated the purely empirical understanding of the classical German philosophy of Kant, Heidegger, and French philosopher Sartre into their interpretation of Mahayana Buddhism, which led Kisaragi Nishida to propose the concept of "absolute nothingness" equal to sunyata, a continuous negation called catuskoti expresses the dualistic idea that one should not assert emptiness and one should not assert non-emptiness. But this is not the kind of "empty" I want to research. Since I think that Kong is not the negation of a negation, nor is it nothingness, nor is it the characteristic Japanese aesthetic of "dharma (open and quiet)[1]," nor is it simply the "Sugata (emptiness)" of the understanding of the text of the Heart Sutra. As it is

Author: Ph.D. Candidate in the School of Philosophy at Fudan University, China. e-mail: yuxi.yi@sciencespo.fr

[1] Dharma is a spiritual essence of "nature is beauty" based on the natural environments in Japan.

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said in the Treatise on the Many, "In sunyata, emptiness is fullness, and fullness is emptiness; formlessness is formed, and formlessness is formlessness. ..... True emptiness is a magical existence." (Abe, Zen, and Western Thought, pp. 126-27). The word "Kong" is used because it is specific to all civilizations and cultures, not simply the "emptiness" of the Japanese Kyoto School and the Zen thought of the Cao Dong School.

Mono no aware, wabi-sabi, and yugen were the key terms and focuses of Japanese Zen aesthetics for a long time. But this is not the entirety of the Japanese aesthetic, nor is it the entirety of the influence of Japanese Zen Buddhism on its artistic aesthetic. Undoubtedly speaking, art is a form of expressing emotions and spirits. By conveying such emotions and spirit through visual means, Japanese art aesthetic is always associated with Japanese Zen thought. Therefore, this paper wants to explore this concept of Kong by selecting one of the visible artistic expressions in Japan. This paper will analyze, interpret and visualize Kong through a type of woodblock print Ukiyo-e. Focusing on the Bijinga-e of the Edo period, it will reveal the veil of the Geisha (or so-called Geiko, Geigi, Oiran, and courtesans) rarely seen in civilian life from the gestures, character, body shape, appearance, background, and costumes of the figures in the paintings, to open the door to the Japanese merchants and samurai. It expresses the dimensions of Japanese thought and the general understanding of life in an aesthetically pleasing way, further revealing the concrete manifestation of "Kong".

II. Literature Review and Method

Contemporary analyses of Japanese Zen aesthetics are mostly limited to the researcher's field of study, such as *On the Beauty Painting in the Ukiyo-e* researcher Xu Qing (2004), who belongs to the category of practical art, so her focus is on the brushwork and painting styles of artists such as Kwaigetsudo Ando and Kita Kawagami. Cox (2013), a member of the Department of Anthropology and the European Centre for Japanese Studies at Oxford Brookes University, focuses his research on the popular and historical imaginings of the connections between Zen Buddhism and Japanese culture. He also gives what kinds of Japanese aesthetic pursuits show dynamic expression within anthropological descriptions and historical criticism. Then again, Jamieson (2018) is a musician who tried to fill in the blank of the research on the influence of Zen and the Kyoto School on the definition of contemporary music aesthetics through the cognition of Japanese music aesthetics. The subject the researchers belong to has limited their thoughts and understanding of Zen and ukiyo-e. This paper will not be confined to a single cognitive system and not just belong to one of the fields of aesthetics and religious philosophy, nor art or fine arts. This paper is an interdisciplinary article with multidisciplinary knowledge background.

The paper draws on Daisetz Suzuki's (2019) definition of Zen, Zen Buddhism, Bushido, swordplay, art, and haiku in Zen and Japanese culture, where he describes in simple, poetic terms what Zen is and highlights how its focus on primitive simplicity and self-effacement has helped shape an aesthetic that permeates Japanese culture. Also, from a more Western perspective, Bayou's (2011) *Du Japon à l'Europe, changement de statut de l'estampe ukiyo-e*, published in *Arts Asiatiques* (Paris) argues that such replicative Japanese prints shed their association with pure classical culture but considered a "fad." This fad articulated an aesthetic attitude of "pleasure" and portrayed a fleeting image of the world that influenced the European market in the second half of the 19th century. After all, nineteenth-century Western artists, comfortable with the academy, needed a new language to express contemporary ideas. The centuries-old fusion of East Asian philosophy and art was a decisive influence (Rodríguez Llera, R, 2022, pp. 368).

Accordingly, I will analyze the Zen Buddhist idea of Kong based on the intellectual background of *Linji Lu* and Huineng's *Tanjing*, the understanding of the personal experiences, creative styles, and paintings of ukiyo-e artists such as Utagawa Yoshitaki and Hokusai, and the influence of these ukiyo-e work on Western post-impressionism. The main research method I use for this study is to ask questions about the relationship between Zen Buddhism Kong and Japanese art aesthetics and Bijinga-e. The research methods used in this article are questioning, synthesis, discovery, judgment, analysis, comparison, and case study analysis using Ukiyo-e works as core examples.

III. Results and Discussion

a) The ideology of " Kong " (its original form in Japan)

Zen Buddhism is a branch of Buddhism that was born as a rebellion against the caste system established in India after the Aryan conquest of the South Asian Subcontinent. This caste system divided Indians into different groups and classes, namely Brahmins who were born in the mouth of Brahma, Kshatriyas who mastered and manipulated politics, economy, military, and culture, Vaishyas who were in the lower position of Brahma named farmers and merchants, Shudras who were of low status, and pariah who were not included in the list. When the Brahmins weakened in the fourth century A.D., Prince Siddhartha broke the caste system, abandoned the superiority he possessed, advocated the equality of all beings, and promoted the universalization, popularization, and colloquialism of Buddhism. Thus, in the beginning, the Kong of "all is vanities" represented the dispossession

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and despair of the once privileged aristocratic and intellectual minority and the absence of class and lack of common knowledge. Moreover, this idea has existed since the beginning of Buddhism. Kong is considered in Mahayana Buddhism to be divided into two parts: the Kong of humans and the Kong of dharma, i.e., the absence of its own body and entity for human beings, and the absence of entity for the existence of all things that arise from causes. Each branch of Buddhism has different interpretations of this "Kong," ranging from "two empty" to "twenty empty," for example, from the four views of the Madhyamakakarika into human emptiness and dharma emptiness, and "three empty" from the Differentiation of the Middle Way from the Extremes. Among them, the "eighteen empty" are interpreted from the Maha Prajna Paramita Sutr, which considers that there are adhyatma-sunyata, bahirdha-sunyata, adhyatma-bahirdha-sunyata, sunyata-sunyata, maha-sunyata, paramartha-sunyata, samskrta-sunyata, asamskrta-sunyata, atyanta-sunyata, anavakara-sunyata, prakrti-sunyata, svalaksana-sunyata, sarva-dharma-sunyata, abhava-sunyata, svabhava-sunyata, abhava-svabhava-sunyata, a total of eighteen kinds of sunyata. They are the foundation of the Nanzen thought of ″无念为宗，无相为体，无住为本[2]." After all, this nothingness is built on the great Kong of the ten worlds and ten directions.

Buddhism was introduced to China at the end of the reign of Emperor Ai of the Western Han Dynasty and went through a long and arduous process in the Eastern Han Dynasty, the Wei, Jin, Northern, and Southern Dynasties, and the Sui and Tang Dynasties. During this period, Zen Buddhism also passed through the six groups of Huineng, Nanyue Huairang, Mazu Daoyi, Baizhu Huaihai, Huangbo Xiyun, and Linji Yixuan, the core figure of the Linji school that eventually spread to Japan. Linji Yixuan, a native of Shandong Province in China today, lived in a period when the Great Tang Dynasty had just issued a decree on the destruction of Buddhism, demolishing more than 4,600 monasteries in the seventh year of the Huichang era, destroying more than 40,000 Caturdesa and Aranya, and returning more than 260,000 monks and nuns to the monastic world. However, the Linji school survived as one of the most prosperous of the five houses and seven schools that emerged during the Northern Song Dynasty[3], and as the ancestor of Japanese Zen Buddhism, which holds the premier seat in Japanese Buddhism, the Linji school must have its uniqueness, which lies precisely in what it advocates ″平常心之道[4]." This normal mind of Linji school is based on material scarcity and intellectual barrenness, as it is said in the Baizhang Qinggui that "one day without work, one day without food," and that the teachings of Linji school are fundamentally based on an atmosphere of political and economic dependence and its "Kong" is also founded in the realm of the need for self-sufficiency to exist.

The Linji lu says that you enter the mortal world, you enter the holy world, you enter the contaminated dust, you enter the pure, you enter the land of various Buddhas, you enter the pavilion of Maitreya, you enter the world of Vairocana, and every place is the land of existence, in which there is existence, decay, extinction, and emptiness. The Buddha appeared in this world, turned the wheel of dharma, and later entered nirvana, but his past and future are invisible to you, so it is useless to seek his birth and death. This kind of invisibility is what Linji understands as the "empty appearance（空相)," a kind of illusion of all things, such as the saying that ″入净入秽、 入弥勒楼阁，又入三眼国土，处处游履，唯见空名[5]。" They are just empty names, and these names are also empty[6]. These empty forms are related to and born with all dramas which do not have 'self-nature' (all the dharmas in this world and the next are without self-nature) and 'birth nature,' because the mind is empty. The dharma is empty, and the single thought is decisively cut off and transcended.

b) The "practice" of "Kong" in Japanese social life and its appearance in Ukiyo-e

The representation of the "Kong" in Zen is the master's "raised whisk" and "Katsu (to yell or to shout, to browbeat, to scold, and hoarse)", as the fundamental Zen that leaves behind words. It is also the foundation of Linji School[7] since there are inherent phrases called ″德山棒，临济喝 (Deshan Bang, Linji He.)." This "Kong" has other manifestations in Japanese everyday life, such as the "Kong" of the declining rule and lack of authority of the Muromachi Shogunate, the ritualistic "Kong" of Bushido that ends with seppuku, and the vacuous, flatulent, degenerate "Kong" of the Japanese merchants' culture. The regime holders who cannot be autonomous and the policies that cannot land from on high are the sticks raised high in the air. And all those abstract glory, rituals, and punishments are the big stick hanging over the heart of the aristocratic warrior ruling class, the thought that hangs for a decision. In addition, the shout

[2] Translated as: For the subject of awareness, the absence of thoughts, to be in all stages but free from all stages, and no basis is fundamental.

[3] There is a saying: ″临天下，洞一隅 Lintian Xia, Dongyi Yu."

[4] Translated as: Ordinary mind is the way.

[5] Yuho, K. T., & MumonYamada. (2017). The Record of Linji. University of Hawaii Press. pp.221

[6] Yuho, K. T., & MumonYamada. (2017). The Record of Linji. University of Hawaii Press. pp.221

[7] Linji considerably developed this tradition and Katsu technique as the so-called "Linji's Four Shouts." He distinguished four different categories of Katsu: 1) the precious sword of the Diamond King, 2) a golden-haired lion crouching on the ground, 3) the search pole and the shadowed grass, 4) not working like a shout at all. Watson, Burton; tr. The Zen Teachings of Master Lin-Chi: A Translation of the Lin-chi lu. New York: Columbia University Press, 1999. ISBN 0-231-11485-0.

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that does not represent public opinion and the parasite that cannot accomplish self-assertion are silent cries. The ultimate and pure expression of unanimity of thought by seppuku is also the outreach of the soul, the silent cry, and the loyalty to achieve the purpose decisively and actively. The merchants at the bottom of Japanese society, who could not get equality and respect, were looking for a place to enjoy themselves amid the turmoil. Their wandering around Hanamachi, Karyukai, and Kagai was their silent warning and cried to the society.

The Edo period was the last period of the feudal era of the warrior families in Japanese history, and the paramount ruler was the Tokugawa family. Since the Tokugawa family eliminated its greatest political enemy, the Tokugawa shogunate has wielded real power while the Mikado enjoys great prestige. The Edo Shogunate established Bushido as their fundamental spirit from the ideological point of view, making the samurai work for them with loyalty, righteousness, and courage as the benchmark of their living and hara-kiri as the code of honor of their death. Bushido greatly revived the status of Zen in Japan, as Peter Haskel says: "The Japanese Zen as we know it today is Tokugawa Zen, a teaching that looks back to its medieval roots but does it through the prism of its particular concerns[8]." The Zen revived by the Tokugawa family is mainly through zazen, meditation, combat, and the spirit of "逢佛杀佛，逢祖杀祖（Fengfo Shafo Fengzu Shazu）[9]" for those who are absent-mindedness and unconsciousness with a "Katsu" by the master. This method helped the military elite of the Shogunate to consolidate militarism. It was also fundamentally different from the foreign values brought by the Christian missionaries. Since the Shogunate during the Edo period forbade the Japanese from practicing Christianity, all Japanese were required to register at Buddhist temples to ensure no conversions occurred. Later, after the Tokugawa family took complete control of Japanese politics, reforms appeared frequently. They used the same method on those peasants with martial families and warriors as obligations which led to turmoil in society. This martial style of rule revealed the rulers' dictatorship and their bad habits in governance. The general citizens and peasants, so-called the "machi people" of the Edo period, who were constantly being crushed and governed, were powerless. However, they became aware of the commercial and handicraft industries emerging around cities, ports, and temples based on economic development and became practitioners. These merchants disrupted the Japanese dualistic class division between the samurai and non-samurai classes. The culture constructed by these people gave the urban population the conditions and leisure to support, for the first time, art and entertainment different from the aristocratic arts and culture and could satisfy the demands and participation of the masses. This entertainment briefly escaped the class status and identity of the "aristocracy," but was limited and constrained by its social environment and assets. Therefore, it was mainly expressed as personal, direct, erotic entertainment for the masses.

In the Edo period of Japanese history, "Kong" was evident from the political system, the vassals, and the masses. In terms of politics, the Shogunate system of the Edo period was based on the military, but it was in a situation of internal and external troubles. For example, in the seventh year of the Kanaga period, the Shogunate accepted the request to open a port under the coercion of the United States and later signed the *Japan-U.S. Treaty of Goodwill* in Kanagawa. Thus, political emptiness was the "Kong" of having no power in the face of the turbulent nineteenth century. The samurai class, the vassal of the Tokugawa Shogunate, and its antagonist, the Japanese merchants, practiced "empty forms" in two ways, respectively. The Japanese merchants sought life, and the samurai sought death, both of which were different in their demands, but both were making and fulfilling their needs. The former sought the "floating world" and used it as a false reality. The latter sought to honor and nobility as their synonyms and hara-kiri as their honor and ritual. Thus, each expresses "Kong" in different acts from the inside. This kind of "Kong" from the heart, in essence, shows their inner emptiness and confusion. That is to say, they do not know what they want, they do not know what they live for, and they do not know what they die for.

In the late 17th century, with the rise of the Japanese merchants' thinking and culture, the Kano and Tosa school of painting, which had served the court nobility, gradually lost its charm and was replaced by this type of Ukiyo-e. Ukiyo-e, with its gorgeous style and explicit materials, was the best able to express the Edo period. And the Bijinga-e was the most expressive of the "Kong" that existed from the hearts of the noblemen to the ordinary people. After all, the degradation of Japan in the Edo period was from the state to the people.

c) Contrast the expression of "Kong" in Japanese Ukiyo-e and post-Impressionist works influenced by East Asian civilization

Most of the Bijinga-e are expressed and painted the Geiko and Geido. Although Geiko is an art and even a national treasure in Japan, it is still a Japanese female

[8] Haskel, P., & 永琢. (1990). Bankei and his world. UMI Dissertation Information Service.

[9] Followers of the Way, if you want insight into dharma as it is, just don't be taken in by the deluded views of others. Whatever you encounter, either within or without, slay it at once. On meeting a Buddha, slay the Buddha. On meeting a patriarch, slay the patriarch. On meeting an arhat, slay the arhat. On meeting your parents, kill your parents. On meeting your relatives, kill your relatives. Then, you attain emancipation. By not cleaving to things, you freely pass through. Retrieved from Linji Lu. pp.236.

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performance tradition, a profession that serves to entertain wealthy clients. The job, which originated during the Edo period and trained women to dance, sing, talk, and host in the Japanese performance style, was a stage performance in Geisha[10], fulfilling the role of emptiness as well as emptiness itself. Just as when some dancers dance, their primary principle is to empty their minds, the rhythm of their bodies and the steps of their feet are their expression and performance, and there is no exception to Geiko. After much practice in traditional Japanese art forms, Geiko's behavior is revealed through a combination of habit and instinct. For example, Kitagawa Utamaro's *The Painting of a Women Playing in Shamisen* uses vermilion, gofunn, ink, and other Yamato-e pigments to freeze-frame the picture of the Minarai-Jaya performing her mastered shamisen, this kind of static performance in Bijinga-e for the acting Geiko is also the expression of "Kong."

Chōbunsai Eishi was born into a family that managed the general finance of a Shogun family, and he was a member of the official hatamoto appreciated by the Tokugawa family. So, his series *Six Immortal Poets* is exquisite, with well-groomed women, from the dresses on the leading figures to the bonsai behind them, all exquisite. This full title of the Bijinga-e is about the Monk Henjo. Henjo (Yoshimine no Munesada) is the grandson of Emperor Kammu and was a waka poet who became a monk of a temple after the death of Emperor Ninmyo. The famous Yamato Monogatari writes about his love story with Ono no Komachi, a beautiful female immortal poet. Most of his waka was light, beautiful, rich in emotions, and humorous. Such as the poet "淡淡绿，丝绦满树，白露珠。春柳枝上，玉珠串串。(Pale green, the tree was covered with silk, with white dew pearls. On the willow branches in spring, jade pearls are strung.)[11]" Henjo's waka is delicate, focusing on the most minor details of the landscape, and he likes to portray it vividly and charmingly. In the Bijinga-e, there are exquisite bonsai of plum blossoms, walls composed of bamboo leaf patterns, and a Karesansui made of fine sand and gravel outside the door, plus some well-stacked stone groups of the miniature garden landscape, which are the setoff of Henjo's waka. The three women in the picture also fill up the picture through their body language and body forms, completing the plot of the story. But, no matter how subtle the images are, the women in these images are treated with the same contempt as the waka, which is folk literature, and regarded as lingering interests by the nobility. The other works of Chōbunsai Eishi are also mostly large-scale, clean, and composed of well-dressed twelve-headed women. These works glorified Kyoto, a city without the darkness that expresses the meaning of the floating world and leads a befuddled life as if drunk or in a dream since that ever-bright city would be an empty city without those Geikos in the painting.



Figure 1: Six Immortal Poets·Henjo

Suzuki Harunobu invented the woodblock prints of multicolored Nishiki-e, and the painterly matters were mostly from classical waka to express the local custom. He often uses Nishiki-e and karazuri printing methods to depict his characters. He painted Bijinga-e, from young girls to Kabuki. The women in his works are between extensive (Bijinga-e aesthetic before him) and slender (Bijinga-e aesthetic after him). For example, in *Lovers Beneath an Umbrella in the Snow*, the dressed similar men and women mean that their love is eternal. Such background with solid and single color makes the picture mysterious, initially revealing the poetic tenderness of the quiet, yugen, and the subtlety of a possible fall with a faint sadness. Another example is Kaigetsudo Ando, whose paintings depicted Geiko in the gesture of standing or looking back, mostly shaped as a reversed Japanese character "く." That pin-up poses are a feature of his paintings, such as Standing Portrait of a Courtesan and Showing a Courtesan. He was a merchant first and last and often ran the Kaigetsudo painting workshop in the Suwa-cho district of Asakusa in Edo. He usually sold his Bijinga-e to the significant number of pilgrims and travelers who returned from Shin-Yoshiwara, Edo's pleasure district. In other words, from the picture to the way of buying and selling, Ando's works are empty in the fictitious transaction, and he is the best representative of Japanese merchants' profit-seeking thoughts.

[10] Foreman, Kelly (2008). The Gei of Geisha. Music, Identity, and Meaning.

[11] Jiang, Wenqing. (2021). Riben Zhonggu Hege 500 Shou: Pingan Shidai De Riben Hege. The People's Press of Yunnan.

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Figure 2: Lovers Beneath an Umbrella in the Snow

Kitagawa Utamaro's Okubi-e (large-headed pictures of beautiful women) is mostly of commoner women or married middle-aged women (a married middle-aged woman with a Shimada hair bun with her eyebrows cut off), expressing the beauty of women in the Edo period through depicting their hair. In the Okubi-e, such as *The Courtesan Ichikawa of the Matsuba Establishment* from the series *Famous Beauties of Edo*, *Ase o fuku onna*, *Sugatami Shichinin Kesho, and Karagoto of the House of Chojiya in Edo-cho Nichome* from the series *A comparison of Courtesan Flowers*, women postures are often expressed by looking into the distance or out of the painting. For example, the color used in *The Hour of Xu* (Figure 3) in the series *The Twelve Hours in the Yoshiwara* is mostly pale red, presenting an indescribable lightness with this light color, and a hazy light black color is added to express the color reflected from the distance as some haloes appear to be erratic. In addition, there are bright blues (sora-iro), reddish blues (benimidori) reflecting on peach blossoms, dark red (kurobeni) and dove feather grey (hatobanezumi) of smoldering flames, and bright and clean whitish green (byakuroku) and aloeswood brown (tonocha) This is the so-called asymmetry and dissonance (fausse) that expresses the Zen meaning. The famous Chinese contemporary writer Eileen Chang once described *The Twelve Hours in the Yoshiwar* in her *Unforgettable Painting.* She said, "The famous ukiyo-e *The Twelve Hours in the Yoshiwar*, which depicts the life of Geisha in twenty-four hours. The attitude of the painter is entirely different respect and solemnity, which is hard to be understood[12]." She analyzed that Japanese Kabuki is selected from a group of people as an institutionalized existence as if the Geisha is a mass lover trained by rules and regulations, and the weight of traditional habits is in the lightest small movements. In *The Twelve Hours in the Yoshiwar*, she only remembered the one in the day from 1 a.m. to 3 p.m. A woman changed into a dressing gown late at night, one hand catching the light flowered dress on her chest to prevent it from sliding down her shoulder, and the other hand holding an incense burner with a fine smoke floating from the incense head. A maid is squatting on the side to serve, painted much smaller than the Geisha. The Geisha stood there as if she were too tall, and her low hanging neck was too thin and too long, and her small white feet, which had not yet reached the wooden clogs, were too small to fit, yet she did know that she was loved, though she was alone at that time, the night seemed quieter and longer. Both the ukiyo-e and the understanding from Eileen idealize the prostitute. This idealization is derived from the system where the Japanese made the Geisha extraordinarily close to the standard of feminine beauty through rigorous training. What we see here is the day from 7 p.m. to 9 p.m., i.e., it should be a famous Geisha in Yoshiwara, and he realistically depicts the Geisha writing haiku and poems to the guests on one side, playing what she has been cultivated during Shikomi including culture, etiquette, language, decoration, poetry, song and dance, and music and music. The woman in the middle of the scene is assigned to a room where she is alone to show her talent to the guests and interact with them, and long scrolls filled with writing are scattered on the floor. Although it is not confident whether she is a Tayu, a Yujo, or something else, at least she is a Yujo, since she was dressed in a gorgeous costume and had a very high hairdo on her head. Although the women in these pictures are slaves (servants) of the yukaku operators, there is still a hierarchy of high and low rank among them. Some are Yujos, while others are maids. Isn't it idealistic and vague to ask each to live in their position and face all this with an ordinary mind? Utamaro is known as one of the three great masters of Japanese ukiyo-e. He expressed not only the organ aesthetics and social tendency and fashion of those kabuki actors but also the political ecology of the Edo period, as expressed in Ehon Taikoki and Hideyoshi and his *Five Wives Viewing the Cherry-Blossoms at Higashiyama*, in which he offended the government and was imprisoned for 50 days. Have to admit that Kitagawa Utamaro opened the pinnacle of Bijinga-e followed by a decline.

[12] Dan, Chen, & Zhang, Ailing. (1995). Xinbi Suiyi: about the Unforgettable Paintings. Mingzuo Xinshang (05), pp. 39-40.

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Figure 3: The Twelve Hours in the Yoshiwar. The Hour of Xu

At the end of the Shogunate, culture, economy, and politics were increasingly impoverished, and the political strength was slowing down, while the financial power of the Japanese merchants was growing and the Shogunate, to which the samurai were subordinate, lacked authority. Ukiyo-e, as a cultural product, was also affected. Painters tended to paint to satisfy the visual stimulation of their buyers. For instance, Utagawa Kunisada's Bijinga-e were close to the culture of Japanese merchants, such as *Hoshi no shimo tosei fuzoku* (Strarfrost contemporary manners) and the *Harvest of Leisure and Catching Fireflies by the Sumida Rive*r (Sumida no hotarugari) all of which had a clear preference for a bent body with some male tension inside of it. The style is to paint those women with a pig's head and a cat's back (猪首猫背). This style has also been taken by Keisai Eisen, Kikukawa Eizan, and others. It embodies the chic, carefully calculated simplicity, and stylish Japanese aesthetic ″粋 (Iki)" of the Japanese Geisha and the idea of "人情噺（real-life story）" in Edo Rakugo. This perspective is derived from daily life and contains relationships and friendships connecting people. This kind of tension and lively atmosphere, with the hazy painting technique, brings out the decadent and depressed mood of Japanese society.

Bijinga-e with the "Kong" thought was widely imitated by European society in the 19th century. After the Universal Exhibition held in London in 1862, the works of the Ukiyo-e were sent to France, where artists such as Stevens, Whistler, Tissot, Latour, Degas, Monet, and others collected the Ukiyo-e artworks. Among them, the Post-Impressionism artists were most interested in this Asian art. Van Gogh's *Pere Tanguy*, Van Gogh's *La Courtisane (after Keisai Eisen)*, Monet's *La Japonaise: Camille Monet in Japanese Costume*, James Abbott McNeill Whistler's *The Princess from the Land of Porcelain*, Gustave Leonard de Jonghe's *The Japanese Fan*, Edouard Manet's *Portrait of Emile Zola,* Mary Cassatt's *Woman Bathing*, and George Hendrik Breitner's *Girl in a White Kimono* are artworks that were produced after the Universal Exhibition when the artists were strongly influenced by the Oriental art school.



Figure 4: La Japonaise: Camille Monet in Japanese Costume

In *La Japonaise: Camille Monet in Japanese Costume* and *The Princess from the Land of Porcelain*, the artist painted his wife as the model in kimono. The composition of the image, the S-shaped pose, and the expression of the woman imitated and converged with Ukiyo-e and Japanese culture. Still, this convergence is limited to the East Asian elements rather than the connotation behind the paintings. In *La Japonaise: Camille Monet in Japanese Costume*, Monet depicts Camille wearing a padded ornate red kimono with the solemn expression of a samurai, standing on a Japanese tatami mat against a wall decorated with Japanese Noh masks and fans. Camille is facing the viewer, and her hair has been painted yellow from black to indicate her European identity, which is typical of European paintings, as well as her smile and dancing figure are different from the bitterness shown in the Ukiyo-e. Monet assembled many Japanese elements, but the complexity and his characteristic primary colorism are antagonistic to the central idea of emptiness embedded in the Bijinga-e. His paintings do

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not contain the humble, degenerate, silent, and hollow emotions that pervaded Japanese people and society; rather we can only perceive the feelings such as surprise and novelty. Besides, the figures in both paintings possess noble status; they are more essential figures like nobles and wives rather than the prostitutes in the Bijinga-e.

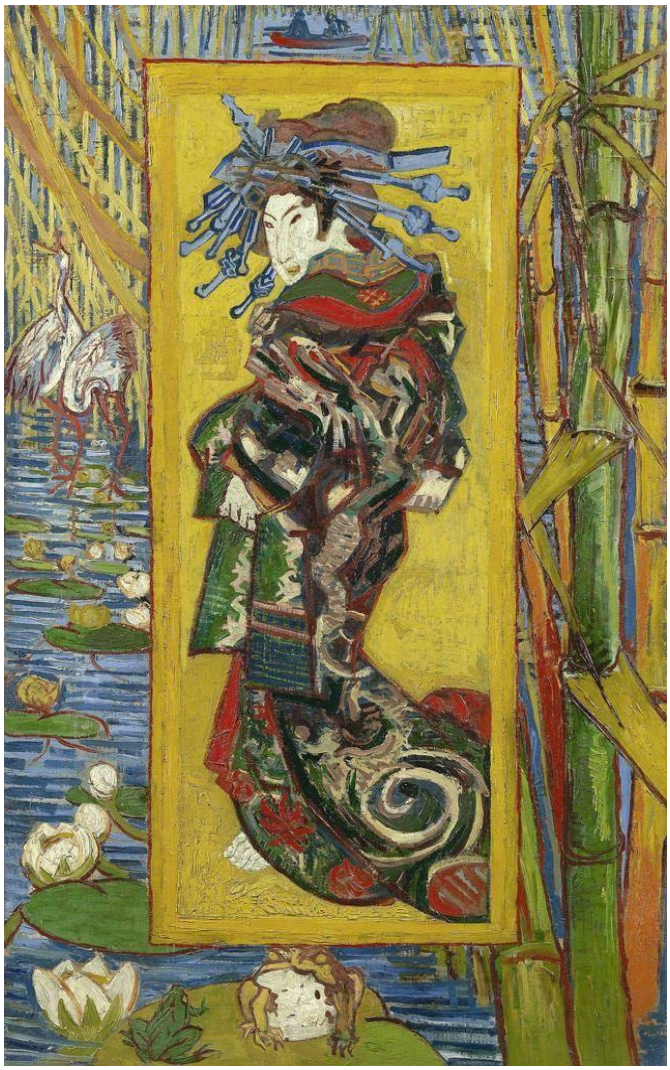


Figure 5: La Courtisane (after Keisai Eisen)

Some may argue that Van Gogh's *La Courtisane (after Keisai Eisen)* depicts an uncompromising Japanese Geisha. Indeed, Van Gogh's copying technique is even better, from the composition of the picture to the content of the painting, which is very similar to Ukiyo-e. Even the frogs and cranes drawn in the background of the image represent the "prostitute" in French slang. But the "Kong" here expressed in this copy from Eizumi Kisai's *Geisha* in 1887 is the one Van Gogh's understanding, as he wrote in his 1888 letter to Theo Van Gogh. He also felt the emptiness everywhere. He did indeed live in a great and true era of artistic revival, but the worn-out traditions still exist. We are powerless and lifeless, and new painters are isolated, impoverished, and treated like madmen. In the 1880s, Van Gogh was trying to break through the shackles, making his brushwork brutal, his forms and colors gradually leaning towards the Eastern style, and even trying to understand Zen Buddhism to understand Katsushika Hokusai. However, this is still unable to truly integrate his attitude and thoughts into the Japanese color reproduction of his paintings, or at least his expression makes it difficult for us to see his proper understanding of emptiness. These paintings are short of more profound thoughts and interests. Van Gogh never visited the last feudal Shogunate in Japan. He could not handle the idea of emptiness of confrontation, samurai spirit, and Machi civilization, with disunity, integration, poverty, and scarcity inside of it. He put it into his work. Van Gogh showed a new rendering of the soul and body of a returned object attached to the native Europe to which it belongs. It is a reproduction of the Kong aesthetic in the picture as if mirroring the people and civilization of a distant Eastern land. The image only expresses the visual beauty without showing the sentiment and story behind the content of the painting itself. As a result, the scenes have an impact on themselves, as Van Gogh combines his distress and confusion with the scenes in the paintings, forming his expression of "Kong." Or perhaps we should say that copy and imitate was originally Van Gogh's intention; after all, Van Gogh said to Theo when he copied Hiroshige Kogawa's painting: "I have found something wonderful that I must copy[13]." It wasn't even just Van Gogh, but many others, such as Gauguin, who painted with Van Gogh for nine weeks in Arles. Gauguin's *A Courtesan*, from the series *Night Cherry Blossoms in the Pleasure Quarter*, after Utagawa Kunisadade, shows a woman with a stiff physique and a background of lamps, balustrades, and cherry blossoms, In the background of the picture, the lamp, the railing, and the cherry blossoms all look like objects placed on top of each other without any connection. The loneliness, contained in "leaning on the railing", looking at the flowers, the moon, and the night, as well as the sadness and sorrow of the wind and the lamp, are not expressed by Gauguin. In other words, in Japanese painting, the matter is the place where color moves and emptiness is the attachment that is not separated from matter, just like the relationship between Courtesan and the railing in the picture. Kong is not emptiness, but the true nature of all dharmas, the true nature of color and mind. The European artists struggled, in replications, to find that mystery and vitality in Asian art that they could not comprehend, to explore the symbolic depth of imitation that had gradually tapered off in traditional European art forms. Perhaps this mimicry was effective, even laying a

[13] Vincent van Gogh to Theo van Gogh Arles: c.25 July 1888. Web Exhibits: https://www.webexhibits.org/vangogh/letter/18/514.htm

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vital foundation for the post-impressionists, leaving greater pictorial space and opportunity for their claim on the evasion of traditional art through the distinctive decorative subjects, elongated image format, asymmetrical composition, aerial perspective, and abstract color of the Ukiyo-e, but this expression lacked a critical understanding and inheritance of a key element in Japanese Zen aesthetics —— "Kong."



Figure 6: A Courtesan, from the series "Night Cherry Blossoms in the Pleasure Quarter"

IV. Conclusion

In general, this paper argues that Kong in Zen and Japanese aesthetics has multiple meanings as it is not subordinate to any interpretations or scriptures alone. We begin by analyzing the initial ideology of the Kong in Japan. Buddhism emerged from Hinduism, passed through China, giving rise to Zen Buddhism, and then went through many generations, dynasties, and transformations before arriving in Japan. From the *Vajra Sutra* to the *Baizhang Qinggui* to the *Linji Lu*, the system and teachings were gradually developed and perfected so that "Kong" was also perfected ideologically and theoretically. Second, we examine the practice of Kong in Japanese daily life, often referred to as the Linji method of Zen practice (Katsu), among the samurai and the townspeople. In this paper, we choose the Edo period, when the Ukiyo-e was formed, as the timeline for our case study. In other words, we analyze "Katsu" in the last feudal era of Japan from three aspects: the ruling authority, the Bushido culture of being towards death, and the carpe diem of the Japanese merchants. Finally, we put this aesthetic into the context of paintings called Bijinga-e, the most famous art form in the Edo period, except for the Ukiyo-e. The gradual collapse of political power in Japan during that era brought a rich, evolving, an additional form of amusements and popular developed Yoshiwars. Bijinga-e is a delicate representation of that era, a true reflection of the emptiness, decadence, and dissipation of the samurai and the townspeople, a sign of the decline and degradation of martial power, and a construction of all the meanings of "Kong." With the spread of Ukiyo-e to the West, Bijinga-e was also copied by many famous Western painters of the Impressionist school. Whether it is the Geisha in the Ukiyo-e or the noblewoman in the Western oil painting, that one thing remains the same. The kind of reproduction after removing the modification of spirit and flesh is the loneliness and desolation that the artist strives to express, the individual human's complicated loneliness, and the unreachable breadth of thought and nature. What "Kong" can achieve is the lack of abundance, and what is mapped out is the same space. However, the Japanese Zen aesthetic ideology of "Kong" has not been inherited. The capture of Western reproductions in the context of Eastern painting is like a net that catches butterflies. The net waved and waved in the sky. The beauty of the "Kong" presentation of Japanese Zen aesthetics is like a flying butterfly, always flying, not in the net. Nobody knows where it goes.

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Forensic Sciences at 50: Past, Present and Future?

By The Hon. Michael Kirby AC CMG

Abstract- In this article, delivered originally as an address to the Australian Academy of Forensic Sciences on its fiftieth anniversary, the author – a past President – reflects on the past, present and future of the Academy. In the review of the past, he recalls the personality of Dr O.R. Schmalzbach who founded the Academy and initiated the successful mix of topics and members in the first 25 years. He then reviews the changes that came about producing the present Academy with more women members, scientists and less ceremony. Looking to the future he concludes that there will be no going back to the old ways. However, he suggests initiatives to broaden the definition of "forensic sciences" beyond primary attention to bench science. He also encourages the revival to some degree of the participation of the leaders of the medical and legal professions and their engagement with the issues of science and society or forensic sciences, broadly envisaged.

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I. Vivat Academia Nostra

If our Founder were here, he would regale the Academy in his beloved Latin:[3]

> Bene scio me a uobis, Academici, plurimis esse oneratum honoribus, quod uos me socium huius praestantissimae Academiae elegeritis, quod uos me etiam, ut uerbis nostri Horati utar, socium honoris causa 'uita dum superest' feceritis, quod uos me praesidem Academiae nominaueritis, quod uos meas scriptiunculas in lucem diei in actis uestris saepe produxeritis, denique quod uos me iam rogaueritis ut orationem anno quinquagesimo ab Academia condita.
>
> 'I am well aware, Academicians, that I have been weighed down by you with numerous honours, in that you have elected me a member of this eminent Academy, that you have even – if I may borrow words from our poet Horace - made me an honorary member 'as long as life lasts', that you have appointed me president of the Academy, that you have often brought forth into the light of day in your journal modest writings of mine, and that finally you have now asked me to deliver an oration in the fiftieth year since the foundation of the Academy.'

In members of my age, memories of the Academy inevitably involve vivid recollections of Dr Oscar Rivers Schmalzbach. He was the founder of the Academy. He left the stamp of his distinctive personality on its objectives, its activities and its perception of itself. As his influence was broad and deep, and overwhelmingly beneficial, it is appropriate to bring him back to our minds in remarks that honour the first half century of the Academy's life.

Oscar Schmalzbach was born on 17 April 1912 in Lvov (previously Lemberg), in Poland. He was a member of the Jewish community that suffered much discrimination in that country. He qualified in medicine in Lvov, Poland and in neurology and psychiatry in Warsaw. However, not long after the Second World War broke out in Poland, in September 1939, he fled via Czechoslovakia to Budapest in Hungary. He then escaped to Palestine and made his way to England. There he secured an appointment to research into brain physiology at Middlesex Hospital in London. He completed post-graduate studies at Maudsley Hospital and at the National Institute of Neurology, Queen's Square. In 1949, he left England for Australia arriving here on Melbourne Cup Day.

Soon after his arrival in Sydney, he was appointed a medical officer at the Callan Park Institution. At the time it was officially called a 'lunatic asylum'. In the 1960s he became senior consultant in psychiatry for the Crown in prosecutions that raised the mental state or capacity of accused persons. His evidence was called in numerous homicide and other cases. The former Associate Justice of the Supreme Court of New South Wales, J.K. McLaughlin, remembers, as a judge's associate, Dr Schmalzbach arriving at court to give evidence before a jury. He was dressed in the formal manner of a Middle Europe expert: wearing a homburg hat, yellow kid gloves and a formal suit. However his down to earth, practical approach to psychiatry well suited the Crown's sceptical scrutiny of insanity and other defences. In 1971, he wrote a book *Profiles in Murder*, based on his trial experiences.

It was in 1967 that Oscar Schmalzbach founded the Academy of Forensic Sciences. He invited Mr Justice Russell LeGay Brereton to be its first President.[4] Effectively, Schmalzbach gathered around himself a distinguished company of judges, lawyers, medicos and a few scientists. They were known personally to him or by public repute. They included the leaders of their respective professions. His objective was to establish a

Author: *e-mail: mail@michaelkirby.com.au*

[1] Text for an address to the meeting of the Australian Academy of Forensic Sciences at the, Union Universities and Schools Club, Sydney, 22 November 2017.

[2] Honorary Life Member and Former President of the Academy.

[3] I am indebted to Professor James Adams, an Australian Latin scholar and now Fellow of All Souls College, Oxford University, for checking my schooldays effort. And to Acting Justice Emmett for this contact.

[4] The inaugural Presidential address was given by Mr Justice Brereton. R.LeG. Brereton, "Evidence in Medicine, Science and the Law" (1968) 1 AJFS 1.

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high level interdisciplinary society that would address topics of mutual concern loosely involving the forensic sciences. There had to be a scientific element. But it did not need to be bench science. He was elected to serve as the inaugural Secretary-General of the Academy. He held that post three times and was twice elected President. He was specially vigilant in upholding the high status of the members.

Because, at that time, senior judges were commonly knighted, they had the inner running in the quest for membership. However, a few medical knights were also admitted (including Sir Douglas Miller and Sir Kenneth Noad). Important scientific knights also joined up (including Sir Ernest Titterton and Sir Philip Baxter). He had an eye for future incumbents of Vice-Regal office, inviting Sir John Kerr, Sir Zelman Cowen and Justice Gordon Samuels into membership and office in the Academy. He spotted judges on the rise (including Sir Harry Gibbs and myself). He was the "kingmaker". But he was also the "defrocker" of the Academy. He rusticated members who fell from his grace, silently removing them from the list of Council members; although he sometimes later restored them equally without explanation.[5] Looking back, it is a tribute to his willpower and personality that he got away with such an autocratic rule over so many powerful personalities. In essence, they submitted to his form of tyranny because they valued the Academy and knew that he was its chief moving force and inspiration.

When Mr Justice Brereton died in 1974,[6] he was succeeded by my predecessor as President of the New South Wales Court of Appeal, Sir Bernard Sugerman. It took a couple of years for the written constitution of the Academy to be adopted; and then only because of the insistence of lawyers that the Academy should have a permanent form outside the notions of the Secretary-General. When adopted, the Constitution delivered most of the power of the Academy to the Council. And the Council was substantially an adjunct to the activities and ideas of the Secretary-General. Four times each year, he organised 'scientific sessions'. In later years they convened at the Sebel Town House in Potts Point. The arrangement for quarterly meetings has continued to the present time. However, as I shall show, there has been a shift in the focus of the activities of the Academy. One of the first papers, at the birth of the Academy reflecting the present focus on science was by Mr L.G. Clark, NSW Government Analyst, on "the role of the forensic laboratory in crimes of violence".[7] Clark's paper identified problem areas that were to take decades to address in Australia, and to which the Academy later contributed.

In keeping with the Oscarian view of the Academy, that lawyers – especially judges - should predominate in power and dignity, the distribution of the Presidency since 1967 has seen nine legal presidents (mostly judges); seven medical; and four scientific or other categories. Until Justice Annabelle Bennett of the Federal Court of Australia was elected (2004-5) no woman served as President. By the time of her election Oscar Schmalzbach had departed the Academy. Indeed, he had died in Sydney on 26 December 1996. Very few women were elected, to the Academy when he was presiding. However, wives were welcome, and some were active participants, in the scientific sessions and the dinners that followed. It is a tribute to the changing times and the leadership of Professor James Robertson AM PSM, as President, that the present Secretary-General of the Academy is a woman (Professor Shari Forbes), as is the Treasurer (Ms Alison Sears). The Founder would doubtless be shocked.

As he grew older, Oscar Schmalzbach's summonses to give forensic testimony in court for the Crown dried up. The Academy effectively became the residual centre of his life. He held the office of Secretary-General for more than 20 years in all. He also served as long-time editor of the Academy's Journal. He was President twice (1976-78) and (1985-87). He even floated the idea, during his second term as President, that he should be elected "honorary life president". This proved a bridge too far.

With great deference to Oscar Schmalzbach and his devotion to the Academy, I resisted this notion, believing that it was inimical to a body that, despite its failings, was nonetheless a valuable intellectual society. Only partly in jest, I pointed out the only life president of distinction in history was probably Simon Bolivar, liberator of the Hispanic Americas from Spanish colonial rule. Distinctive as Oscar's service had been for the Academy, it did not rise to that level. His idea was eventually dropped. Oscar knew when he did not have the numbers. Instead, I was myself elevated to the Presidency. He accepted this substitution with good grace.

By the late 1980s, Oscar Schmalzbach was clearly failing. Honour was saved when he was designated the "Founder", a factual not a constitutional office. To this day he is memorialised on the letterhead of the Academy. There his name can still be seen. Generations will come who never knew Oscar Schmalzbach, the man. However, within the Academy, whilst memories of him remain fresh amongst the older members, his astonishing personality should be

[5] Commentary: 'Reflections on the Formation of the Australian Academy of Forensic Sciences on the Fortieth Anniversary of the Journal' by Maurice J. Sainsbury (2008) 40 *Australian Journal of Forensic Sciences* 97 at 98. Dr Schmalzbach himself wrote a history on the creation of the Academy; O.R. Schmalzbach, "A Short History of the Formation of the Australian Academy of Forensic Sciences" (1968) 1 AJFS 20-22.

[6] Obituary (1972) 6 AJFS 288. An obituary of Mr Justice R.LeG. Brereton appears (1974) 48 ALJ 280.

[7] (1975) 9 AJFS, 196.

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recorded and his central contribution should be honoured. As it happens, I believe that the Founder has an important continuing message for the Academy of today. I shall return to that theme by way of remembering the focus of the Academy during the years that Dr Schmalzbach exerted primary influence on its membership, meetings and intellectual endeavours.

II. First Quarter Century: Broad Focus

What was the magic formula that Dr. Schmalzbach dispensed in the first quarter century of the life of this Academy? How did so many extremely busy, senior and even powerful members find time to turn out regularly in such large numbers for the Academy's scientific sessions? It was surely not the food at the Sebel Town House, passable though it was. Nor was it the occasionally tedious and even misogynistic approach of the Secretary-General to some issues presented for debate.[8] The presence of so many accomplished and senior professional members was obviously secured by the intellectual fare that was regularly presented for consideration and debate. There was also the common feeling that the Academy was useful, stimulating and valuable as a source of cross-disciplinary information that moved beyond the strict professional boundaries of most of its members. In a sense, the very seniority of many of the participants attracted junior professional members, from the same profession. It was a privilege to rub shoulders with one's own professional leaders. It was also stimulating to meet and gain the perspectives of the leaders of other disciplines, gathered in the Academy. Professional leaders demonstrated their knowledge and skills. They were willing to be beckoned out of their specialised disciplines to listen to the younger members and external and overseas experts, addressing topics of the day. Overwhelmingly, they stayed and valued the Academy's sessions.

Oscar Schmalzbach had an eye for the important issues and controversies of his time. They had to be issues of cross-disciplinary interest or the members would have drifted away and withdrawn.

When I reviewed the scientific sessions of the Academy, up to the commencement of my Presidency in 1987, I did so by a review of the papers published in this Journal, derived from the earliest quarterly "scientific sessions".[9] In seeking to rediscover the "magic formula" of that time, it is useful to return briefly to that analysis.

1. *Sentencing*: The sentencing of convicted offenders was a matter upon which most participants in the Academy between the 1970s-1980s had an interest. Sometimes they had perspectives that were useful to share. On this basis, sentencing law and practice was a principal subject of the scientific sessions in the first half of the life of the Academy.

Sir Leslie Herron (first Patron of the Academy and also Chief Justice of New South Wales) provided an early paper on "The Science of Sentencing".[10] Over 25 years, a range of topics dealing with crime and punishment was examined. They included a paper by a frequent participant, David Biles, on "Penal Reform" and another by Gordon Hawkins (one time prison governor in England and an inaugural commissioner of the Australian Law Reform Commission) who addressed "Prisoners' Rights". This was a topic in an age when many experts did not conceive that prisoners had many rights at all. Dame Roma Mitchell was one of the few women in the early years, invited to address the Academy. She also chose the topic of sentencing. Sir Zelman Cowen examined "Crime and Society". Professor Tony Vinson (who moved from academic life to Corrective Services) addressed "The Social Drama of Corrections". In volume 13 of this Journal, I, myself offered a paper focussed on a topic based on the then current work of the Australian Law Reform Commission (ALRC) on "New Trends in Crime and Punishment".[11]

2. *Evidence*: The next most popular topic of the Academy's scientific sessions, and a recurring theme of the Academy in the 1970s and 1980s, was the Law of Evidence and how it affected the proof of crime and forensic facts. A repeated topic under this heading was identification evidence. By the 1980s the risks of identification evidence had become well known to the judiciary. Those risks were frequently mentioned in the rulings and decisions of Australian courts.[12] In the Academy, important papers were delivered on this theme in the early days by Sir Bernard Sugerman and also by a fine federal judge, Sir Richard Eggleston.

Mr Justice Brereton, who had presided in the trial of the notorious Mrs Grills, convicted of murdering her victims by the use of rat poison, presented a paper on that topic. G.D. Borrows spoke of hypnosis in evidence. Sir Ronald Wilson, a Justice of the High Court of Australia, read a paper on "Lying and Confabulation". Dr C.B. Degotardi examined the then state of evidence on the potential use of "truth drugs" in the search for safe and convincing evidence.

[8] He wrote a paper on "Evil in Women: the Delilah Syndrome". It proved very controversial. It was hotly contested and criticised; but not supressed by the Academy. See O.R. Schmalzbach, "Evil in Women – "Delilah Syndrome" A New Psychiatric Syndrome" (1983) 15 AJFS 53. See also O.R. Schmalzbach, "Pathological Lying – Psydologia Phantastica" (1973) 5 AJFS 45.

[9] M.D. Kirby, "Forensic Sciences – What Have We Learnt?" (1987) 20 AJFS 183. See also M.D. Kirby "Hail and Farewell" (1989) 22 AJFS 23.

[10] Sir Leslie Herron, "The Science of Sentencing" (1969) 2 AJFS 80.

[11] M. D. Kirby, "New Trends in Crime and Punishment" (1980) 13 AJFS 96.

[12] See e.g. *Domican v The Queen* (1992) 173 CLR 555.

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3. *Science and Technology*: Another recurring theme was the general impact of science and technology on criminal trials and on the evidence called in those trials. This issue was tackled by Sir John Minogue, a Victorian judge who had become Chief Justice of Papua New Guinea, then an Australian colony and mandated territory. Sargent A. Clarke wrote on "Crime Scene Analysis".
4. *Computer Analysis of Evidence:* There were several papers in the early years on the identification of ballistic evidence and the analysis of voice recordings measured against the best available scientific standards. The growing availability and capacity of computer scrutiny of masses of factual testimony was beginning to be felt. The Academy was there at the outset. There were many papers on this theme.
5. *Youth and Law:* Another common theme for the Academy was the interaction of youth with the law, especially criminal law. The guest appearance of "beatnicks" was noted by Dr Masserman. The impact of youth unemployment was examined by Tim Moore. Issues of battered children and of young people in the law attracted a paper by Sir Ninian Stephen (former High Court Judge and later Governor-General). Sir Harry Gibbs (later High Court Justice and President of the Academy) and Sir Ronald Wilson (High Court Judge) addressed issues of young people, crime and forensic science. In one session, the Secretary-General stretched his stern rules to permit Simon Bleasel, son of President medico Dr. Kevin Bleasel, to speak on this topic on behalf of youth. The participation of young persons was even rarer than the participation of women.
6. *Drugs:* The concern of the Australian community about the impact of narcotic and other illegal drugs was reflected in many papers read to the Academy. These included one by Justice Ray Reynolds (NSW Court of Appeal) on the impact of criminal responsibility. Another paper was presented by G.V. Chesheger on the dangers of cannabis. (It looks somewhat old fashioned viewed with today's eyes). The impact of alcohol and drugs on older offenders was explored. On this topic, Oscar Schmalzbach was himself far from conservative. He presented a paper on what he saw as the web of disproportional laws and powers to deal with drug use in Australia. This remains a challenge and a legitimate topic for an intellectual society like the Academy. If senior cross-disciplinary professionals do not examine the direction of such laws (and also the recent laws on terrorism) who will?
7. *Sex:* The eternal subject of sex was examined in many papers. Professor Duncan Chapell (ALRC commissioner) examined the topic of rape in marriage. Astonishingly, until the High Court abolished it, the common law crime of rape had no application to the conduct of husbands in relation to their wives.[13] Entering into marriage was taken by the common law to exclude complaint about a husband's violence, however objectively excessive and disrespectful.

J.S. Andrews tackled the sensitive subject of incest in a paper titled "Incest: Who Needs It?" Most lawyers and other experts steer clear of this topic because of common visceral reactions. However, the Academy tackled it. Likewise the topic of transsexualism. Justice Samuels, earlier the President at the Academy, read a sympathetic and sensitive paper on "Transsexualism".[14] It introduced the topic to members of the Academy, most of whom had never met a transgender person. There is no record that a transgender participant was invited to attend and speak to the topic.

8. *Psychiatry:* Naturally enough, with such a Secretary-General, many sessions of the Academy addressed problems of psychiatry. Dr Schmalzbach read a paper of his own on "Lying, Including Pathological Lying". He also invited a paper by the respected United States judge, David Bazelon, on "The Perils of Wizardry". This warned against the overreach of the claims of psychiatry.
9. *Hot Topics:* Common to the agenda of the Academy's scientific sessions were topics of the moment. They concerned topics that seemed likely to present diverse subjects with a forensic element. Thus Sir Ernest Titterton and George Seddon gave papers on the environment and its challenges. Several papers addressed pesticides. Industrial relations was a recurring and often highly political topic in Australia. This subject was opened up to discussion by Sir John Moore, President of the Conciliation and Arbitration Commission and by Justice Terry Ludeke, a Deputy President. Phillip Adams, still regularly broadcasting on the ABC on today's 'hot topics', delivered a paper on films and censorship. Except for purely transient issues, the members of the Academy could rely on the Secretary-General to spot a subject of public controversy and to find serious and knowledgeable commentators who could unravel the issues for the examination, questioning and education of the members.
10. *World conflict:* Nor did the scientific meetings of the Academy in those days confine themselves to local or national issues. Possibly because of his own background and experience in war and

[13] Abolished in *The Queen v L* (1991) 174 CLR 379.
[14] G.J. Samuels "Transsexualism" (1984) 16 AJFS 57.

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escape, Oscar Schmalzbach insisted on sessions that addressed some of the most serious topics of the world. Thus the two nuclear knights, Sir Phillip Baxter and Sir Ernest Titterson, examined the subject of nuclear dangers. I recall the occasion when Dr. Schmalzbach insisted on a session that was addressed to psychiatric illness in world leaders and how nations, and the United Nations, could respond effectively where a world leader appeared mentally unbalanced, yet in control of fearsome weapons of mass destruction.[15]

I remember, at the time, thinking that this was an absurd topic. Such concerns belonged solely to the internal arrangements of each nation state. So indeed they still may. However, the advent and election of President Donald Trump of the United States of America and of North Korea's Supreme Leader, Kim Jong-un, renders this topic more relevant and urgent today than I originally conceded. A flood of Presidential tweets at 2am Washington D.C. time, often in extreme language, suggests that the subject is more serious and urgent than I once imagined. The two leaders appear to share features of narcissism; a tendency to violent language; a habit of self-praise and walking around clapping their own performances. The existential dangers to humanity of the weapons under their control make the subject of national and global checks on political leaders a reasonable subject for rational debate. Oscar Schmalzbach saw this and brought the topic to the attention of the Academy's distinguished members years before contemporary justifications.

III. The Present 1993-2017: Into the Engine Room

Determined to supress any Bolivarian tendencies on my own part, on demitting office as President in 1989, I withdrew virtually completely, as in other offices I have held, from the activities of the Academy. Very occasionally I would give a talk (as I did recently on my mandate from the UN Human Rights Council as chairman on the UN Commission of Inquiry on North Korea). However, I was determined not to interfere. The current President, Professor Robertson, has held the office of President twice (2010-15) and (2016- to date). This is an honour only previously enjoyed by Dr. Schmalzbach. At least this is the case unless one considers that the Presidencies of Mr David Bennett AC, QC (2000-2001) and of his wife Justice Annabelle Bennett AO, QC (2004-5), fall within the coverture of marriage as being essentially the separated manifestations of the one personhood.

However, for some reason, which is something of a mystery, the number of judges and barristers who have joined the Academy and attended its sessions of late has fallen away in the recent quarter century. Along with the loyal toast to the Queen, and the portraits of H.M. the Queen and H.R.H. the Duke of Edinburgh, which hung behind the main table of Academy dinners in the Sebel Town House, vice-regal occasions have virtually disappeared. The wearing of decorations, so beloved of Dr Schmalzbach,[16] is no more. It is to rekindle memories of those earlier charming customs that I have worn tonight the insignia of the Order of the Rising Sun, recently presented to me by the Emperor of Japan for my work on North Korea.

Glamour, celebrity and professional leaders dressed to the nines in the 1970s and 1980s were a common feature of professional life the 1970s and 1980s. They did seem to attract professional members throughout the first half of the life of the Academy. Perhaps these symbols of power were a feature of public life generally in those years. Perhaps it was part of the 'male' thing that predominated in the Academy at that time. However, it is not only such external elements that have changed significantly in the Academy. The business of the Academy appears almost totally to have changed. It is now very much focused on scientific and forensic activities in the sense of police and prosecution evidence and expert opinions relevant to court cases. These played a part in the early years; but only a part. And a small part at that.

Take Issue No. 3 of the latest volume of the Journal (Vol. 49). It contains papers on the analysis of human hair;[17] skeletal trauma;[18] forgery detection;[19] parallel sequencing;[20] parentage analysis;[21] sexual determination from the study of mandibles;[22] and cloud storage in forensics.[23] The same subjects also predominate in Volume 49 Issue No. 4. Apart from the opening items in that issue, containing obituaries (including one of Sir Peter Lawler OBE (b.1921, d. 2017)), written by the President and myself concerning an habitual participant at Academy sessions in the old days, the scientific papers effectively represent the business and interests predominately of those who gather, analyse and seek to present scientific forensic evidence to establish, or cast doubt on, the criminality of an accused person. Substantially, these articles in the

[15] Cf. Bruce Guthrie, "Trump might be feigning insanity" *New Daily* October 14, 2017: available http://thenewdaily.com.au/news/world/2017/10/14donald-trump-crazy/?utm_source=Responsys&utm_campaign-20171015. The article contains a report of a panel of psychiatrists warning that anyone as "unstable" as Mr. Trump should not be entrusted with the life and death powers of the presidency".

[16] He was appointed an Officer of the Order of the British Empire (OBE) 1979.

[17] (2007) 49 AJFS 239.

[18] (2017) 49 AJFS 261.

[19] (2017) 49 AJFS 281.

[20] (2017) 49 AJFS 308.

[21] (2017) 49 AJFS 326.

[22] (2017) 49 AJFS 332.

[23] (2017) 49 AJFS 344.

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Academy's Journal address the matters of importance for Crown Prosecutors, police agencies, terrorism experts and (occasionally) defence counsel.

The latest part of the Journal (Vol. 49 Part 4) contains papers on cranio-facial gunshot wounds;[24] experts in land and environment litigation;[25] fatal falls;[26] soil analysis;[27] age estimation by vertebrae;[28] age estimation on juveniles;[29] fatal hyperthermia in rat livers;[30] lethal brush abrasions;[31] and plastic bag asphyxia.[32]

Each of these topics is likewise interesting, occasionally fascinating, and in its own sphere important. Thus, the published paper on "brush abrasions" by Melissa Thompson examines minutely the evidence (photographs were deleted) about a cyclist who was collected by a fast moving truck and dragged great distances along the road causing his death. The evidence, analysed in the paper, helped to convict the truck driver of causing death by dangerous driving. These are therefore not trivial subjects. Inferentially, they reflect the concerns of many, perhaps most, of the present members of the Academy. My point is solely that they are very different subjects, with a much narrower focus, than those that gathered the great and the good to the meetings of the Academy two decades ago.

Occasionally today there is an Academy conference which addresses large issues affecting the judiciary and legal process.[33] However, the dominance of scientific and laboratory bench perspectives of forensic sciences was certainly established at least by 2012.[34] At that time, the Journal became the official publication of the Australian and New Zealand Forensic Science Society (ANZFSS). In 2016 the Journal moved to six issues annually, comprising 720 pages. This was so as to include publishable scientific papers which were felt to have a market not currently served by other learned journals.

The Academy is now an almost entirely different organisation than it was in the first half of its institutional life. It has a mainly police, prosecution and courtroom focus. It does not address large philosophical issues about society, its laws and professions; still less its national governance, the safety of our world and the impact of science, medicine and law upon the nation and the planet. The emphasis of the Academy has shifted away from law and even medicine[35] towards highly specialised, intricate scientific and expert evidence of interest mainly to full time official forensic personnel. There is little or no ceremonial. On the other hand, the repeated calls of the Academy for the creation of a national centre for forensic studies have at last been heeded. President James Robertson, is the director of that body at the University of Canberra. The Academy and its journal obviously serve the needs of an expert community. Moreover, it is probably a community whose interests were not, or not adequately, catered for in the past, certainly by this Academy.

IV. The Academy and the Future: 2018

The foregoing reflection on the past and the present of the Academy of Forensic Sciences inevitably raises a question about the future of the Academy. If the "towering figures" of the professions of law and medicine cease joining the Academy or coming to its scientific sessions, nothing can be done to force them to do so. They will only participate if they see utility and/or pleasure and interest in doing so. It is most unlikely that Chief Justices of the High Court and the most senior judges, silks and medical practitioners would regularly come to events focused on highly precise and particular scientific subjects of the kind recorded in the most recent parts of this journal. This is because they would not feel that they could add much to the discussion of such topics. As the case of brush abrasions illustrates, the subjects may be important and even potentially interesting. But the opportunity for dialogue and meaningful interchange to which diverse professional leaders could contribute, is small. If this is so, most such people (and their spouses) will find a better way to use their time.

In 2018 it is possible that rebuilding any substantial part of the life of the Academy to engage with the subjects of yesteryear would now be impossible. Certainly, it would be exceedingly difficult. Just as it is difficult now to get busy professionals to resume attendance at church, or in Rotary Clubs or participation in old fashioned gentlemen's clubs (even when they have admitted women as members). Social life in every society continually changes. Perhaps there is also more scepticism, less deference and smaller perceived utility in comingling with professional leaders, than was the case up to the 1990s. Certainly, one hopes, there would be no return today to the substantial male only domain. The fact that the Academy now includes many more women and younger and diverse members is unquestionably an advance. It is one that I constantly urged upon Dr Schmalzbach and the Academy in my time as President, but without success.

[24] (2017) 49 AJFS 369.
[25] (2017) 49 AJFS 392.
[26] (2017) 49 AJFS 392.
[27] (2017) 49 AJFS 403.
[28] (2017) 49 AJFS 421.
[29] (2017) 49 AJFS 449
[30] (2017) 49 AJFS 459.
[31] (2017) 49 AJFST 468
[32] (2017) 49 AJFS 468.
[33] See (2010) 42 AJFS 1 – 49 (a conference on judicial reasoning in 2010).
[34] (2012) 44 AJFS (4), 319.
[35] (2017) AJFS 49 483. M.D. Kirby, "World AIDS Day – Reflections by Lake Geneva" (1999) 21 *AJFS* 75.

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This notwithstanding, the Academy should accept the challenge of broadening the focus of its definition of "forensic sciences". In doing so, it could look at some of the topics that were examined by the Academy in the first half of its corporate life. It should do this because of the objective importance of those topics and the outstanding contributions that the Academy made in those days to cross disciplinary enlightenment, dialogue, shared wisdom and fostering an appropriate "big picture" focus. This depended on a very broad definition of what forensic sciences were about.

The broader view, originally adopted about the domain of "forensic sciences", opens up cross-disciplinary dialogue about some of the most important issues of our time. It is a dialogue in which expert and non-expert discussion is helpful to the traditional professions, to their members, and to society.

The topics which we examined in the Academy in the 1970s and 1980s, always with the assistance of highly respected experts, broadened the lens of our focus. They included nuclear weapons; environmental challenges and climate change; global poverty; the operations and limitations of the United Nations Organisation;[36] even the extent to which world leaders should be subject to psychological checks and civic scrutiny addressed to their mental health, given the destructive weapons and missiles entrusted to many of them.

Self-evidently, such topics provoke energetic exchanges among non-experts. They make for interesting, stimulating and enjoyable intellectual and social occasions. If they were restored to the agenda of the Academy, even occasionally, they might attract once again the "wise heads" whom, as a young man, I met in the activities of the Academy. We cannot revive Oscar Schmalzbach or anyone like him. Today, that may be just as well. To a very large extent, his opinions and attitudes are out of harmony with the present age. Still his focus was never just the laboratory bench. It was the world, the nation, our society and its professions. In my opinion, the Academy needs to revisit its focus. Certainly more than it has done in recent years. The bench scientists (who should certainly retain a major say in the subjects of discussion) would probably enjoy occasional engagement with the subjects of "forensic sciences", assigning that discipline the broader ambit it formerly assumed.[37]

In 1973, not long after the establishment of the Academy in Sydney, and before I became a judge or involved in the Academy's affairs, Sir Leon Radzinavicz, the noted British expert in forensic sciences, addressed the Academy and looked to its future. Asked where forensic science academies were headed, he predicted:[38]

> "There is never an end to invention. We are now witnessing a hippie fashion amongst our young criminologists… Each generation needs to discover something fresh. The pendulums swings backwards and forwards and progress depends on an uneasy balance. Perhaps this is the philosophy of middle age. To invent you have to be young. Perhaps the advice I can give to the elderly and impatient is to say "wait". …To quote G.K. Chesterton, another enthusiastic Englishman:
>
> "For there is good news yet to hear and fine things to be seen,
>
> Before we go to Paradise by way of Kensal Green."

[36] Such as a paper addressed following the advent of the AIDS epidemic: M.D. Kirby: "AIDS – Insights from the Stockholm Conference" (1988) 20 AJFS 282 (based on the author's closing summation at the International Conference on AIDS in Stockholm on 16 June 1988). Also M.D. Kirby "AIDS and Human Rights" (1991) 22 AJFS 29. See also M.D. Kirby, "Medical Negligence – Going Dutch" (2001) 33 AJFS 59 and M.D. Kirby, "DNA Evidence: Proceed with Care" (2001) 33 AJFS 9.

[37] The President James Robertson reflected several times on the changes that were happening in the Academy. J. Robertson, Editorial, "The Times They Are A-Changing' – Or Are They?" (2014) 46 AJFS 1.

[38] (1974) 6 AJFS 11. See also (1987) 20 AJFS 183 at 193. Kensal Green is a cemetary in London with a crematorium.

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The Legal Regulation Model of Open Banking in China

By Mi Wang
Liaoning University

Abstract- Although, open banking has been developed rapidly in China since 2018, there is not a clear legal regulatory framework. Open banking can stimulate competition, provide better services to customers, and reduce the traditional "screen-scrapping" risk. However, it causes concerns over data security, customer privacy, data abuse and challenges to current Chinese regulatory system. Therefore, it is necessary to establish a better regulatory system for open banking in China. Through learning from regulation forms in other jurisdiction, it is found that "active guidance" regulation is more appropriate for China which requires government to provide standards for open banking but not force banks to share data. Under the "Active Guidance" model, it is necessary to improve current Chinese regulatory and legal regime including establishing feasible rules for data portability implementation, constructing a multi-level regulatory system for data sharing, as well as changing data privacy protection mode from "Notice-Consent" to "Data Autonomy".

Keywords: *open banking, data sharing, data autonomy, data privacy, data portability.*

GJHSS-H Classification: *LCC: K564.C6*



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The Legal Regulation Model of Open Banking in China

Mi Wang

Abstract- **Although, open banking has been developed rapidly in China since 2018, there is not a clear legal regulatory framework. Open banking can stimulate competition, provide better services to customers, and reduce the traditional "screen-scrapping" risk. However, it causes concerns over data security, customer privacy, data abuse and challenges to current Chinese regulatory system. Therefore, it is necessary to establish a better regulatory system for open banking in China. Through learning from regulation forms in other jurisdiction, it is found that "active guidance" regulation is more appropriate for China which requires government to provide standards for open banking but not force banks to share data. Under the "Active Guidance" model, it is necessary to improve current Chinese regulatory and legal regime including establishing feasible rules for data portability implementation, constructing a multi-level regulatory system for data sharing, as well as changing data privacy protection mode from "Notice-Consent" to "Data Autonomy".**

Keywords: open banking, data sharing, data autonomy, data privacy, data portability.

I. Introduction

Under the age of digital economy, the most precious property is "data", which is called the "new oil" [1]. On 9th April 2020, Chinese state council issued the policy *Opinions of Building a More Complete Market-Oriented Allocation System and Mechanism for Factors*, which firstly indicated that, except for land, labor, capital, technology factors, "data" has become 5th major factor of production.[2] This policy emphasized the status and importance of data in China and stimulated the potential development of data market. Data also plays a significant role in financial market. Many countries and areas such as United Kingdom (UK), United States (US), Australia, Hongkong, Singapore and European Union (UK) have taken measures to encourage Fintech companies to take advantage of data to innovate financial products. They develop the "open banking" model to authorize customers with data portability right to give Fintech companies access to their financial data for obtaining better financial services and products. Open banking can bring many benefits such as stimulating Fintech industry, strengthening competition in financial market, providing customers with better products etc. However, open banking may bring some risks, which require government legal regulation. Different countries and areas implement distinct supervision and regulation model. EU and UK applied the perspective regulation model which forces banks to share data through legislations, but US takes the voluntary model which authorizes enterprises to decide how to share data and relevant standards of data sharing. Hong Kong and Singapore take the active guidance regulatory model where government only sets standards without forcing banks to share data. Open banking also developed quickly in China, however, legal framework of open banking is not mature, which might be a barrier to future open banking development. In comparison with open banking regulation model in other jurisdictions, currently China should adopt the "active guidance" model for open banking development before establishing a mature legal system. This article will introduce the background of open banking, and the current open banking practice and legal basis in China. Also, benefits and flaws of open banking would be discussed. Then, through analyzing open banking regulation in other jurisdictions, this article would suggest that active guidance model should be applied in China and give specific advice of establishing Chinese open banking regulation structure under this the active guidance model.

II. Background

It is necessary to understand the definition and characteristics of open banking before exploring the proper regulation model in China. Also, it is supposed to consider the differences in culture, economic and financial development from other regions regarding open banking. Therefore, it is reasonable to consider the current open banking practice and relevant rules and policies in China.

a) Definition of Open Banking

There is no uniform definition of "open banking" all over the world. EU legislation defines "open banking" as a term which broadly describes a financial system in which personal financial data can be shared with

Author: Liaoning University, China.
e-mail: 476581369@qq.com

[1] Charles Arthur. 2013. Tech giants may be huge, but nothing matches big data. https://www.theguardian.com/technology/2013/ aug/23/tech-giants-data (Access on 9 May 2023).
[2] Chinese State Council. Opinions of the CPC Central Committee and the State Council on building a more complete market-oriented allocation system and mechanism for factors. 2020.

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multiple companies at the direction of consumers.[3] Advisory Committee describes open banking as "a system that allows consumers to securely and efficiently transfer their financial data between financial institutions and accredited third-party service providers in order to access services that can help them improve their financial outcomes.[4]The Basel Committee on Banking Supervision describes as "the sharing and leveraging of customer-permissioned data by banks with third party developers and firms to build applications and services, including for example those that provide real-time payments, greater financial transparency options for account holders, marketing and cross-selling opportunities".[5] From the technical perspective, open banking can described as a system where banks adopt open application programming interfaces ("APIs") that allow consumers to share their financial information with third-party providers ("TPPs") by allowing their software to communicate with each other.[6]

Although there is no standard of defining open banking, analyzing from the above definitions, it is reasonable to claim that there are three parties in open banking relationship including the bank, consumer and third-party provider. Open banking governance mainly refers to financial data regulation over banks and third-party providers, and financial data governance is a dynamic process with its core components interact as different regulatory forces interact.[7]

b) Open banking characteristics

Open banking focuses on serving consumers, with API or SDK technology as the core technology and financial ecology as the main form.[8] According to the definition of open banking, there are three main characteristics of open banking including data portability, customer autonomy and recipient accountability.[9]

i. *Data portability*

The International Standards Organization (ISO) defines data portability as the "ability to easily transfer data from one system to another without being required to re-enter data."[10] Based on these definitions, consumers are able to share their relevant bank data with TPPs under open banking, which is consistent with "data portability". Data portability in open banking is supported by interoperable standardized data technology, primarily APIs".[11]

ii. *Customer autonomy*

Consumer autonomy is the ability to reflect on what one has good reasons to do in the marketplace, and to act accordingly, which is a foundational principle of liberal democracy whereby marketers are granted license to influence consumers, provided they respect their autonomy.[12] Open banking authorizes consumers to control the sharing of their banking data, and it is supported by the legal rights of customers to share their data through open banking.[13]

iii. *Recipient accountability*

Open banking makes the recipients (TPPs) of shared customer banking data accountable to customers.[14] Therefore, Fintech companies which receive banking data should be responsible for protecting these data from leaking or stealing etc., and regulation over TPPs are very important.

Generally, these three characters of open banking both reflect the goals of improving competition, encouraging innovation, and enhancing consumer protection.[15]

c) Practice and policies of open banking in China

Open banking has been developed quickly in China since 2018, however, there is no mature legal system to supervise open banking. Before exploring proper supervision model, it is necessary to find the

[3] DELOITTE. How to flourish in an uncertain future Open banking. Report. 2017. P9-11. https://www2.deloitte.com/uk/en/pages/financial-services/articles/future-banking-open-banking-psd2-flourish-in-uncertainty.html (Access on 11 May 2023).

[4] Advisory Committee on Open Banking. Final Report. 2021. https://www.canada.ca/en/department-finance/programs/consultations/2021/final-report-advisory-committee-open-banking.html (Access on 11 May 2023).

[5] Basel Committee on Banking Supervision. Report on Open Banking and Application Programming Interfaces. 2019. P4. Report on open banking and application programming interfaces (APIs) (bis.org) (Access on 11 May 2023).

[6] Andreas Myers. BANKS ARE OPEN FOR BUSINESS RECOMMENDED REVISIONS TO SECTION 1033 OF THE DODD-FRANK ACT. 2022. N.C. J.L. & Tech. 24. P73.

[7] DOUGLAS W. ARNER. & GIULIANO G. CASTELLANO. & RIKS K. SELGA. Financial Data Governance. 2023. Hastings L.J.74. P241.

[8] Yang Bin. Speech at the Second China Internet Finance Forum. 2018. https://finance.sina.com.cn/money/bank/bank_hydt/2018-12-08/doc-ihmutuec7398251.shtml (Access on 25 May 2023).

[9] Scott Farrell. Designing Data Rights for Canadian Open Banking Lessons from Banking Law in Australia and the United Kingdom. 2022. Sask. L. Rev.85. P170-172.

[10] International Organization for Standardization. Information Technology – Cloud Computing – Interoperability and Portability. 2017. https://www.iso.org/obp/ui/#iso:std:66639:en. (Access on 9 May 2023).

[11] Oscar Borgogno & Giuseppe Colangelo. Data Sharing and Interoperability: Fostering Innovation and Competition through APIs". 2019. Computer Law & Security Review. 35(5). 105314. https://doi.org/10.1016/j.clsr.2019.03.008

[12] Thomas Anker. Autonomy and Marketing: History, Present and Future. 2022. https://www.jmmnews.com/autonomy-and-marketing/#:~:text=Broadly%2C%20consumer%20autonomy%20is%20the%20ability%20to%20reflect,consumers%2C%20provided%20they%20respect%20their%20autonomy%20%28Anker%2C%202020%29. (Access on 9 May 2023).

[13] Scott Farrell. Designing Data Rights for Canadian Open Banking Lessons from Banking Law in Australia and the United Kingdom. 2022. Sask. L. Rev.85. P170.

[14] Scott Farrell. Designing Data Rights for Canadian Open Banking Lessons from Banking Law in Australia and the United Kingdom. 2022. Sask. L. Rev.85. P172.

[15] Scott Farrell. Designing Data Rights for Canadian Open Banking Lessons from Banking Law in Australia and the United Kingdom. 2022. Sask. L. Rev.85. P172.

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current open banking practice in China. Although there is not a uniform law governing open banking in China, there are some other relevant rules and policies regarding open banking, which must be considered by Chinese regulators.

i. *Open banking practice in China*

Open banking is a starting point for the digital transformation of China's banking industry, and an important direction to promote the development of China's digital economy and financial technology. According to the *2019 Open Banking Development Research Report* issued by the Internet Finance Association of China, a survey of 51 commercial banks of various types found that 65% of commercial banks have established open banking platforms. China's first open bank was established in 2018. In 2018, SPD Bank launched the API BANK in the industry, which is driven by API architecture to enrich financial scenarios and integrate into the business ecosystem. Later, other domestic commercial banks began to explore such models. By the end of 2019, about 65% of China's commercial banks had participated in open banking. Different from other open banking practice in other jurisdictions, the development of China's open banking is initiated by major banks, and the formulation of relevant legal systems and governance frameworks for open banking is still in progress.[16]

The implementation of China's commercial bank open banking is mainly through the establishment of open platforms, but not all banks disclosed their open platforms. Most open platforms of commercial banks are only used and maintained internally and would only be disclosed when it is necessary to connect them with partners. In principle, when banks establish their own open platforms, they have the "passive ability" to acquire customers, that is, users can apply by themselves through documents and service instructions on open platforms and obtain corresponding services by themselves.[17] The following Table 1 shows the open banking practice among several commercial banks in China.

Table 1

Open Banking Practice in China: Several Commercial Banks	
Industrial and Commercial Bank of China(ICBC)	Building an Open Smart Banking Ecosystem Since 2018, ICBC has launched the EC0S construction project of smart banking, taking "openness" as the core feature of smart banking. It reshapes the new open business architecture, implements the open transformation of IT architecture, creates a series of cross-border cooperation platforms, which supports and promotes the construction of digital, intelligent and open financial services, and builds an open "smart banking ecosystem".
Bank of China(BOC)	Bank of China proposed the concept of open platform as early as 2012, and officially released the BOC Open Platform in 2013, opening more than 1,600 interfaces, involving transnational finance, collection and payment, mobile payment, as well as map services, network inquiry, exchange rate quotation and other services.
China Everbright Bank	On the one hand, China Everbright Bank actively integrates financial products and services into the production scenarios of cooperative companies. On the other hand, China Everbright Bank would build the mobile banking app into an open mobile financial ecosystem, making mobile banking a hub for extensive connection with external partner companies and Internet users, and a platform for customers operation.
Shanghai Pudong Development Bank (SPD Bank)	API Bank of SPD is an organic unity of business and technology, openness and ecology, capabilities and scenarios, focusing on providing basic financial products and services such as accounts, payment and settlement, and product sales, supplemented by value-added financial products such as orders management and equity exchange. After SPD Bank API Bank was put into operation, the number of application scenarios and docking partners increased steadily. In the first half of 2019, there were 304 API open interfaces, with a daily transaction volume of about 200,000-300,000 transactions and a peak transaction volume of about 1 million. It also connects with 124 partners such as China UnionPay and JD Digital. SPD Bank API Bank open functions involve account management, loan financing, payment and settlement, investment and wealth management, equity activities, information inquiry, foreign exchange business, innovative services, and other services in 9 major sectors and 246 APIs.

[16] Internet Finance Association of China. Open Banking Development Research Report. Preface part. 2019.

[17] Yealink Bank. Analysis of the latest development status and trend of open banking in 2021. http://www.openbanks.com.cn/openbanks_article/100046.html (Access on 9 May 2023).

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China CITIC Bank	China CITIC Bank has been committed to the deep integration of financial technology and application scenarios. In September 2019, China CITIC Bank launched three major retail banking open products based on the application ideas of "open, boundless and warm", "Payroll Easy", "Credit Vision" and "Cardless", which is consistent with open banking concept. Through cooperation with leading enterprises in various industries, it integrates financial technology and banking, solves specific problems in actual scenarios, that innovates and extends new scenarios of banking services.
China Minsheng Bank	Minsheng Bank mainly builds open banking through direct banking, applies "ABC" technology (AI, Big Data, Cloud Computing) to helps the bank to find business entry points.
Bank of Jiangsu	Bank of Jiangsu adopts the product responsibility system for business management, and the opening of products and services is the responsibility of its competent department, including the work from determining cooperation standards, partner expansion to business connecting online. The open banking project team of Bank of Jiangsu is responsible for specific technical docking. In 2019, there are more than 40 open cooperation contents of open banking.
Shenzhen Qianhai WeBank	Shenzhen Qianhai Weizhong Bank developed an open banking model in loan business, mobile payment business, interbank technology business, and financial technology business.
Sichuan Xinwang Bank	Sichuan Xinwang Bank was officially opened on December 28, 2016, and is the first private bank in Sichuan and the first Internet bank in the central and western regions. Since its inception, Xinwang Bank has integrated the concept of openness into its business model, risk management, and daily operations. Compared with traditional banks, Xinwang Bank has created a flat organizational structure that adapts to open banking, which reduces the intermediate level of approval, enables rapid trial and error iteration updates, and flexibly adjusts operations and business models according to market conditions.
Chongqing Fumin Bank	Chongqing Fumin Bank is the first private bank in the central and western regions. Under the background of digitalization as the core strategy, Chongqing Fumin Bank strengthens its open banking capabilities through self-empowerment, and realizes business openness through cooperation and sound financial environment.
AI Bank	AI Bank, a member of the Open Banking Eco-Accelerator, is the first independent legal person and direct sales bank in China, and officially opened on November 18, 2017. AI Bank has established the "Smart Inside" platform as a unified entrance for Shengfang Bank, widely connecting scenarios, fintech companies and financial institutions. At present, more than 350 API interfaces have been opened, achieving minute-level access, docking with more than 80 platforms such as Baidu, Xiaomi, and iQiyi, and exporting open banking capabilities such as credit, wealth management, bank accounts, and intelligent risk control, realizing the integration and symbiosis of financial services and scenarios.

Source: from Internet Finance Association of China Research Report of Open Banking 2019

In April 2021, China Ping An Bank and Boston Consulting Group jointly released the "China Open Banking White Paper 2021" (The White Paper), which points out that open banking has large-scale commercial value. The White Paper indicates that open banking is the only way for the digital transformation of Chinese commercial banks, and it represents a platform-based business model. From 2015 to 2020, marked by the emergence of standardized interface, China's open banking entered the "Open API" era. Although standard APIs, SDKs, mini programs, and H5 bazaars have appeared in the market, however, in many cases, specially designed development is still required. The White Paper also points out that at present, commercial banks in China still face many challenges when carrying out open banking. Firstly, the implementation effect of open banking is not good since there is no detailed and executable strategies or sufficient resource guarantee. Secondly, banks are still in the early stage of exploring the open banking model and therefore their business model is not mature. Building an open banking platform is a huge project, which requires a huge amount of capital, time and manpower. Thirdly, in China, commercial banks still lack experience and ability to deal with new fraud risks and security risks, without enough ability to effectively use scenario-specific non-financial data to create scenario-specific risk control models. Also, small and medium-sized banks are facing difficulties, lacking competitive power in open banking. Furthermore, there exists a conflict between the commercial banks and Internet enterprises. For instance, commercial banks tend to focus on risk prevention and compliance, but Internet enterprises tend to pay more attention to customer experience and business growth, which causes the obstacles to cooperation between commercial banks

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and their partners.[18] It is necessary to create a better legal environment for commercial banks to participate open banking in China.

ii. *Policies regarding open banking in China*

a. *Policy of interface security technical specifications*

In February 2020, the People's Bank of China (PBOC) issued the *Code for Security Management of Application Programming Interfaces of Commercial Banks*, detailing security technologies and security requirements such as the types and security levels of APIs of commercial banks, security design, security deployment, security integration, security O&M, service termination and system offline, and security management.[19] This is China's first specification on APIs, and then open banking has official clear technical standards in China.

b. *Macro policies of promoting open banking construction*

In August 2019, the PBOC issued the *Financial Technology (FinTech) Development Plan (2019-2021)*, which stated that "cross-border cooperation should be deepened with the help of APIs, software development kits (SDKs) and other means, and new business paradigms should be created with the help of high-quality channel resources in various industries, so as to maximize the use of resources and build an open, cooperative and win-win financial service ecosystem".[20] This marks that China has begun to attach importance to open banking and vigorously promote data sharing and cooperation.

Under this policy, commercial banks with certain fintech capabilities have begun to build their own open platforms to achieve the goals of cost saving, unifying interface standards, serving more scenarios, and integrating more scenarios.[21]

In January 2022, the PBOC issued the *Fintech Development Plan (2022-2025)*, proposing to rationally use fintech to enrich the level of the financial market, optimize the supply of financial products, continuously expand the reach radius and radiation scope of financial services, bridge the digital divide between regions, groups and institutions, and make the development achievements of fintech more extensive, deeper and fairer to benefit the broad masses of the people and help achieve common prosperity.[22]

In January 2022, the China Banking and Insurance Regulatory Commission issued the *Guiding Opinions on the Digital Transformation of the Banking and Insurance Industry*, emphasizing the need to actively develop industrial digital finance, build a digital financial service platform, promote the construction of open banking, and strengthen scenario aggregation and ecological docking.[23]

In January 2022, the China State Council issued the *Fourteenth Five-Year Plan for the Development of the Digital Economy*, which put forward the priority actions of "digital inclusive financial services" and clarified the key directions for comprehensively promoting the construction and development of digital inclusive financial services in the context of promoting common prosperity.[24]

c. *Policies of strengthening the protection of data and personal information*

In February 2020, the PBOC issued the *Technical Specifications for the Protection of Personal Financial Information*, which clarifies the security protection requirements for the collection, transmission, storage, use, deletion and destruction of personal financial information from two aspects: security technology and security management. Regulatory authorities further strengthen the protection of open banking user information, establish and improve security assessment and technical security index systems, and improve information release and open service risk compensation mechanisms.[25]

In February 2021, the PBOC issued the *Guidelines for Data Capacity Building in the Financial Industry*, which points out the direction and basis for financial institutions to carry out data work, guides financial institutions to strengthen data strategic planning, focus on data governance, strengthen data security protection, promote data fusion applications, fully release the value of data, consolidate the data foundation for open banking to accelerate digital transformation and development, and build core financial competitiveness that adapts to the development of the digital economy era.[26]

In April 2021, the PBOC issued the *Financial Data Security Data Life Cycle Security Specification*, which puts forward standards for promoting the implementation of data security management and data security protection in the financial industry. It is aimed to provide scientific basis and guidance for the financial

[18] China Ping An Bank and Boston Consulting Group. China Open Banking White Paper. 2021.
[19] People's Bank of China. Code for Security Management of Application Programming Interfaces of Commercial Banks. 2020.
[20] People's Bank of China. Financial Technology Development Plan (2019-2021). 2019.
[21] Yealink Bank. Analysis of the latest development status and trend of open banking in 2021. http://www.openbanks.com.cn/openbanks_article/100046.html (Access on 9 May 2023).
[22] People's Bank of China, Financial Technology Development Plan (2022-2025). 2022.
[23] China Banking and Insurance Regulatory Commission. Guiding Opinions on the Digital Transformation of the Banking and Insurance Industry. 2022.
[24] China State Council. The Fourteenth Five-Year Plan for the Development of the Digital Economy. 2022.
[25] People's Bank of China. Technical Specifications for the Protection of Personal Financial Information. 2020.
[26] People's Bank of China. Guidelines for Data Capacity Building in the Financial Industry. 2021.

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industry to formulate preventive measures and respond to security incidents, and provide a strong guarantee for the application and flow of open banking data.[27]

III. Benefits and Flaws of Open Banking

Open banking can bring many benefits for the society. Open banking can stimulate competitions in financial industry, providing customers with better financial products and services. Also, open banking can reduce the data risks brought by the traditional "screen scrapping" measure taken by Fintech companies before. Nevertheless, open banking also causes some concerns among the public, such as the risks of data security, invasion of privacy and the data abuse. Furthermore, open banking may challenge the current regulatory system.

a) *Benefits*

Data is the "new oil" in the financial world[28], through making usage of data, open banking can bring benefits to the Fintech companies, customers, banks and the whole society.

i. *Stimulate competition*

Open banking was legally established in the UK in 2017[29] and in Australia in 2019.[30] In both jurisdictions, the primary objectives for doing so were similar: improve competition, to encourage innovation, and to enhance consumer protection. [31] Policymakers from different regions share a common goal of increasing competition in attempting to promote open banking. Open banking is aimed to strengthen competition in the financial sector by allowing a huge number of Fintech companies to access personal financial data. [32] In the past, there existed the problem of lack competition and innovation in the financial industry. While small banks struggle to find resources to innovate, large banks have limited incentives to do so due to their oligopoly rents and government guarantees as systemically important financial institutions. This caused the competition-resistant financial market. Open banking creates a great opportunity for Fintech companies since small banks lack the ability to innovate, and large banks lack the incentives to do so, but Fintech companies have both.[33]

In recent years, many Fintech companies have sprung up to attempt to disrupt the financial sector through using new technologies and tapping into new markets. These companies have tended to focus on addressing two of the most severe financial frictions: asymmetric information and switching costs. Data portability in open banking can ameliorate these two issues since customers can transfer their banking data to TPPs as they like more conveniently. By using technology to automate and improve decision-making, it is possible to promise to lower frictions in the financial sector and bring more competition into the financial market.[34]

ii. *Better financial products for customers*

As open banking strengthens competition in the financial market, more Fintech companies and other TPPs would have easier access to financial industry. This in turn allows consumers to have more opportunities to enjoy financial services and products from a wider variety of Fintech companies and other financial services providers, which help consumers better control their financial lives. [35] For example, consumers are allowed to aggregate their income, bill payment, and spending data to better understand whether they can afford a new home or a major purchase. Open banking can also help consumers obtain better rates through sharing their complete financial and non-financial data with lenders. By this way, consumers can provide a more holistic picture of their financial situation and potentially obtain more favorable terms.[36] Also, it is possible for consumers with adverse credit histories to qualify for more loans, as lenders could review payroll data.[37] Except for this, open banking can stimulate inclusive finance development in China since it can help small and medium-sized enterprises to obtain short-term loans and financing by giving lending institutions a better understanding of their cash flows.[38] This is a win-win measure. Lenders can judge the bad debt risk through analyzing the financial information of small and medium-sized enterprises. On

[27] People's Bank of China. Financial Data Security Data Life Cycle Security Specification. 2021.
[28] Charles Arthur. 2013. "Tech giants may be huge, but nothing matches big data". https://www.theguardian.com/technology/2013/aug/23/tech-giants-data (Access on 9 May 2023).
[29] Competition and Markets Authority. Update on Open Banking. 2021. https://www.gov.uk/government/news/update-on-open-banking (Access on 9 May 2023).
[30] The Australian Government the Treasury. Inquiry into Future Directions for the Consumer Data Right. 2020. https://treasury.gov.au/publication/inquiry-future-directions-consumer-data-right-final-report (Access on 9th May 2023).
[31] Scott Farrell. Designing Data Rights for Canadian Open Banking Lessons from Banking Law in Australia and the United Kingdom. 2022. Sask. L. Rev.85. P176.
[32] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P608.
[33] Cesare Fracassi & William Magnuson. Data Autonomy. 2021. Vand. L. Rev. 74. P342.
[34] Cesare Fracassi & William Magnuson. Data Autonomy. 2021. Vand. L. Rev. 74.P338.
[35] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P608.
[36] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P608.
[37] Cesare Fracassi & William Magnuson. Data Autonomy. 2021. Vand. L. Rev. 74. P75.
[38] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P609.

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the other hand, with the help of a wider range of financial data, these enterprises with sound cash flows data can obtain better loan rates, while reducing the loss risk of lenders Simultaneously.

iii. *From "screen scrapping" to APIs in open banking*

Open banking can encourage Fintech companies and other financial service providers from "screen-scrapping" to APIs. [39] Traditionally, many financial service institutions utilize screen-scraping to collect information which is the process of scanning a website and extracting data, to access consumer information. For example, when Fintech companies cannot access customer data directly, they utilize screen-scraping to manually collect banking data using the online banking login credentials of their consumers. While screen-scraping allows for these companies to quickly gather information, it poses risks. Screen-scraping has significant flaws as a method of data collection. Initially, by collecting the login credentials of consumers, screen-scraping increases the fraud and identity theft risks faced by users. Secondly, screen-scraping may prevent banks from knowing when third parties access their customers' data, which reduces the effectiveness of their anti-fraud and cybersecurity systems. Thirdly, when consumers authorize Fintech companies to access their data through screen-scraping, they do not always understand that they are revealing their login credentials to the Fintech.[40]

Screen-scrapping risks could be alleviated by APIs in open banking, improving the safety, scope of access, and consent of the consumer.[41] Regarding risks posed by screen-scraping, the U.S. Treasury has recommended consumer data changes that "would effectively move firms away from screen-scraping to more secure and efficient methods of data access." Therefore, it is significant to develop open banking to provide Fintech companies and other financial service providers with direct access to the data.[42]

b) Risks

Even open banking can bring many social and economic benefits, it still causes wide concern regarding data security and customer privacy protection, abuse of data risks as well as suspicion to the validity of financial supervision. It is necessary to find relevant risks for designing a proper regulatory model for China.

i. *Data security and customer privacy*

Open banking triggers the privacy protection problem. Financial privacy laws of many countries predate the emergence of the Fintech sector and offer consumers relatively limited control over how companies use their financial data.[43] There are concerns over data security and customer privacy regarding their financial lives since personal information is being transferred to third parties.[44]

ii. *Abuse of data*

Open banking would increase both the number of entities that collect personal financial data and the amount of information that private companies know about individuals' financial lives. As industry experts observe, with the development of open banking, the risk monetizing or misusing consumers' data is likely to increase as a wider range of companies obtain access to it. [45] These companies might abuse consumers' personal data by using the data beyond the purpose and scope authorized by consumers, and it is hard for consumers to know of it.[46] Even if consumers found that their data was abused or leaked illegally, it is hard for them to be compensated from this since there might be several companies or institutions have access to their data, it is hard for consumers to prove exactly which party abused or leak their data.

iii. *Regulatory challenges*

Open banking is very different from traditional banking business, and the existing regulatory system of commercial banks is based on current financial practices, and the digitalization of traditional financial products and businesses would bring great difficulties to legal regulation. When dealing with the risk of data sharing in open banking, it might be difficult for the existing legal regulatory system to monitor financial risks effectively.[47]

[39] Cesare Fracassi & William Magnuson. Data Autonomy. 2021. Vand. L. Rev. 74. P96.
[40] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P605-607.
[41] Cesare Fracassi & William Magnuson. Data Autonomy. 2021. Vand. L. Rev. 74. P98.
[42] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P607.
[43] THE AUSTRALIAN GOVERNMENT THE TREASURY. REVIEW INTO OPEN BANKING: GIVING CUSTOMERS CHOICE, CONVENIENCE AND CONFIDENCE. 2017. https://nla.gov.au/nla.obj-2817047138/view (Access on 10 May 2023).
[44] Cesare Fracassi & William Magnuson. Data Autonomy. 2021. Vand. L. Rev. 74. P75.
[45] THE AUSTRALIAN GOVERNMENT THE TREASURY. REVIEW INTO OPEN BANKING: GIVING CUSTOMERS CHOICE, CONVENIENCE AND CONFIDENCE. 2017. https://nla.gov.au/nla.obj-2817047138/view (Access on 10 May 2023).
[46] Xuan Di & Fang Yan. Risk Challenges and Legal Regulations of China's Open Banking Data Sharing. Credit Reference. 2022.7 (282). P41-42.
[47] Xuan Di & Fang Yan. Risk Challenges and Legal Regulations of China's Open Banking Data Sharing. Credit Reference. 2022.7 (282). 282, P42.

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IV. What Legal Regulatory Model should be Applied for Open Banking in China

Although open banking has developed sharply in China since 2018, there is still no uniform legal regulation system. Legislation and regulation are always lagging in the era of digital finance and Chinese government intends to apply "wait-to-see" policy to find a proper regulatory model for open banking. As many other countries and regions have established legal regulatory model for open banking, it is reasonable to explore their regulatory systems, from which Chinese government can learn how to design its own open banking regulatory model based on China's culture, financial and economic development situations.

a) *Regulatory models of open banking in other jurisdictions*

European Unions, UK, US, Australia, Singapore, Hong Kong and India have established their open banking regulation system, and Brazil[48], Mexico[49], and Japan[50] have all recently taken steps to introduce open banking frameworks. However, these regions adopted different regulation models of open banking due to the difference in their culture, economy, financial markets, etc. Generally, there are three types of regulation models as follows.

i. *EU and UK: Compelling Model*

EU and UK adopted the statutory model for open banking development, which forces banks to authorize consumers with data portability and access to data. EU extensively highlighted the importance of data portability and data transfer issue. Cecilio Madero Villarego, senior competition official in the EU, said in late 2019: "Among other things, we will continue to make sure that digital incumbents don't make it too difficult for consumers to switch to competitors or use them in parallel."[51] E.U. Council passed the Revised Directive on Payment Services (PSD2) in 2015, which aimed to go further than the initial Payment Services Directive in opening up banks to data sharing arrangements and competition from fintech firms.[52] PSD2 forces banks and other payment providers to grant access to consumer accounts to third-party providers for account information aggregation services. Also, it requires payment providers to ensure that any time consumers access their account or initiate transactions, payment processors confirm that they consented to the transaction.[53] Also, the Article 20 of the EU General Data Protection Regulation ("GDPR") mandates that individuals have a right to data portability.[54] This reserves the term "portability" to a required transfer when one person wishes to transfer the data. These legislations establish the legal foundation of open banking development.

The application of the legal obligation to share data under UK open banking is complicated, including PSD2 and GDPR, and compliance is required by Account Servicing Payment Service Providers.[55] However, not all commercial banks are required to share data and comply with specific UK data sharing standard. The UK established open banking to address a competition problem in the retail banking market, identified by the UK Competition and Markets Authority ("CMA"). Open banking in UK also allowed the EU to implement its PSD2. The CMA Order established an Open Banking Implementation Entity ("OBIE") to create UK data standards for data sharing. The UK Standards were required to cover not only APIs, data formats, and security, but also governance arrangements and customer redress mechanisms. Further, these standards were mandated to have the features necessary for banks to comply with the open banking requirements of PSD2.[56] However, only the nine banks and building societies specified under the CMA Order, known as the "CMA9," are required to comply with the data sharing obligations.[57]

ii. *US: Voluntary Model*

US adopted the voluntary and market-driven model for open banking regulation, which allows the market rather than the government officials to mainly regulate open banking development. Instead of adopting a mandatory open banking regime, the U.S. Treasury has recommended that regulators should remove legal and regulatory uncertainties which inhibit financial data sharing between banks and Fintech

[48] Banco Central Do Brasil. Open Finance. https://www.bcb.gov.br/en/financialstability/open_banking (Access on 10 May 2023).
[49] New Open Banking Regulation in Mexico. https://www.gtlaw.com/en/insights/2020/6/open-banking-en-mexico-nueva-regulacion (Access on 10 May 2023).
[50] The Slow Introduction of Open Banking and APIs in Japan. https://www.frbsf.org/banking/asia-program/pacific-exchanges-podcast/open-banking-apis-japan/ (Access on 10 May 2023).
[51] Cecilio Madero Villarejo. The Legacy of Commissioner Vestager and a Peek into the Future.2019. https://ec.europa.eu/competition/speeches/text/sp2019_12_en.pdf (Access on 12 May 2023).
[52] Cesare Fracassi & William Magnuson. Data Autonomy. 2021. Vand. L. Rev. 74.P364.
[53] Cesare Fracassi & William Magnuson. Data Autonomy. 2021. Vand. L. Rev. 74. P364.
[54] Article 20 of General Data Protection Regulation. EU.
[55] Scott Farrell. Designing Data Rights for Canadian Open Banking Lessons from Banking Law in Australia and the United Kingdom. 2022. Sask. L. Rev.85. P189.
[56] Scott Farrell. Designing Data Rights for Canadian Open Banking Lessons from Banking Law in Australia and the United Kingdom. 2022. Sask. L. Rev.85. P177.
[57] Scott Farrell. Designing Data Rights for Canadian Open Banking Lessons from Banking Law in Australia and the United Kingdom. 2022. Sask. L. Rev.85. P189.

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companies. This is based on the belief that U.S. market would be best served by a solution developed by the private sector.[58] Although section 1033 of the Dodd-Frank Act requires providers of financial products and services to make available to a consumer, upon request, any information in their possession or control "relating to any transaction, series of transactions, or to the account including costs, charges and usage data."[59] However, it only creates an express data access right in favor of customers themselves, but it says absolutely nothing about whether financial institutions must also share this data with third parties.[60] In US, there is not a well-developed legal framework for open banking, and the burden of developing common data sharing standards has largely fallen to the financial services industry itself.[61] US adopted this model due to the characteristic of its financial market: fragmentation. The United States is home to the world's largest, most fragmented, and most diverse financial services industry.[62] The fragmentation makes it very hard to rapidly respond to new market developments, and therefore it is reasonable to sustain coordination between regulators and industry. This can explain why the US has taken what has been described as a "market-driven" approach to open finance.[63]

iv. *Singapore and Hong Kong: Active Guidance Model*

Different from EU/UK and US, the strategies in Singapore and Hong Kong are both characterized by "active guidance" model. Under the "active guidance" model, regulators only set standards for banks and other payment providers, but without issuing legislative mandates. The central banks in Hong Kong and Singapore have developed open APIs designed to foster collaboration between incumbent banks, fintech disruptors, and data aggregators.[64]

Singapore has been very active in building infrastructure and implementing regulatory guidance through guidelines and nonbinding documents. This guidance serves as the basis of its open finance strategy, which suggests that the regulator-led approach is another possible data governance style.[65]

Hong Kong has begun regulating open banking since 2018.[66] Hong Kong's regulations do not require banks to share account and transaction data. The regulations issued by Hong Kong Monetary Authority require the largest banks to develop open APIs, but they permit banks to choose which TPPs can access customer data.[67] Different from other jurisdictions, Hong Kong requires banks to conduct ongoing supervision and due diligence of the TPPs they partner with and establish contractual terms that mitigate the risk that customer data will be misused.[68] The HKMA believes that this model would strike a balance between innovation and consumer protection since it requires banks to play a custodian-like role with respect to customer data.[69]

b) "Active Guidance" Regulatory Model Should be Applied in China

Through analyzing the open banking regulation models from other regions, there are three main regulation forms including compelling model in EU and UK, voluntary and market-driven model in US and active guidance model in Singapore and Hong Kong. There is not "correct" regulatory model for open banking since each model has its own advantages and disadvantages. Also, governments from different countries have distinct incentives to develop open banking, therefore, it is reasonable to choose regulatory regimes in consideration of their special national conditions. Referring to current legal basis, culture, and financial market development in China, it is more reasonable to adopt the "active guidance" model for regulating China's open banking.

i. *Compelling Model is not Proper for China*

The compelling model of open banking is not suitable for China due to the immature legal framework and the special financial environment in China. The "regulation-driven" compelling model can promote implementation of open banking relatively quickly

[58] Steven T. Mnuchin & Craig S. Phillips. A FINANCIAL SYSTEM THAT CREATES ECONOMIC OPPORTUNITIES: NONBANK FINANCIALS, FINTECH, AND INNOVATION. Report to President Donald J. Trump. 2018. https://home.treasury.gov/sites/default/files/2018-07/A-Financial-System-that-Creates-Economic-Opportunities---Nonbank-Financi....pdf?mod=article_inline (Access on 10 May 2023).

[59] Article 1033(a)-(b) of Dodd-Frank Act.

[60] Dan Awrey & Joshua Macey. The Promise & Perils of Open Finance. 2023. Yale J. on Reg. 40. P19.

[61] Dan Awrey & Joshua Macey. The Promise & Perils of Open Finance. 2023. Yale J. on Reg. 40. P21.

[62] Dan Awrey & Joshua Macey. The Promise & Perils of Open Finance. 2023. Yale J. on Reg. 40. P18.

[63] Basel Committee on Banking Supervision. Report on Open Banking and Application Programming Interfaces. 2019. P8-9.Report on open banking and application programming interfaces (APIs) (bis.org) (Access on 11 May 2023).

[64] H.K. MONETARY AUTH. OPEN API FRAMEWORK FOR THE HONG KONG BANKING SECTOR. 2018. https://www.hkma.gov.hk/media/eng/doc/key-information/press-release/2018/20180718e5a2.pdf (Access on 8 May 2023).

[65] Financial Data Governance, 74 Hastings L.J. 235, P258.

[66] H.K. MONETARY AUTH. OPEN API FRAMEWORK FOR THE HONG KONG BANKING SECTOR. 2018. https://www.hkma.gov.hk/media/eng/doc/key-information/press-release/2018/20180718e5a2.pdf (Access on 8 May 2023).

[67] Gilbert + Tobin, Open Banking Regimes Across the Globe 2018, https://www.gtlaw.com.au/knowledge/open-banking-regimes-across-globe (Access on 8 May 2023).

[68] H.K. MONETARY AUTH. OPEN API FRAMEWORK FOR THE HONG KONG BANKING SECTOR. 2018. https://www.hkma.gov.hk/media/eng/doc/key-information/press-release/2018/20180718e5a2.pdf (Access on 8 May 2023).

[69] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P620.

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because of the policies ensuring its implementation efficiency. However, it fails to take into account the size and strength of banks and tends to pursue "absolute fairness" and therefore leading to unfair opening consequences, accelerating the loss of competitiveness of small and medium-sized banks. Also, administrative orders may stifle commercial and technological creativity.[70] More importantly, the "regulation-driven" model requires a complete and mature legal regulation system. The compelling model derived from EU and UK, which was adopted by Australia, Brazil, Mexica and other countries.[71] Compelling regulatory model forces banks and other payment provider institutions provide data to Fintech companies or other TPPs following the instructions of consumers. This model is effective in promoting open banking since some banks would be reluctant to share consumers' data to other companies to protect competitive advantages. Actually, there is a tension between data sharing and the economic interests of many banks that collect personal financial data. These banks may depend on collecting large amounts of personal financial data to maintain a competitive edge and therefore those economic interests can disincentivize banks from giving consumers control of their data.[72] Therefore, under compelling model, banks must authorize customers with data access which can effectively stimulate open banking development. However, in compelling model, regulators play a significant leading role in data sharing and open banking development and therefore it is required to provide regulators with a clear legal implementation framework. This legal framework must contain unambiguous legislations regarding data rights and data sharing obligations, the clear allocation and cooperation of regulatory powers, regulatory-led third-party access certification and unified technical standards.[73] However, unlike EU or UK, there is no clear and feasible legal framework in China supporting regulators to compel banks to share data. Although article 45 of the *Chinese Personal Information Protection Act* regulates that if individuals request the transfer of personal information to their designated personal information processor, satisfying the requirements provided by the state internet information department, the personal information processor shall provide a channel for the transfer,[74] which seems provided the legal basis for data portability, there are no other rules or legislations supporting the implementation of data portability. And there are no other relevant legislations or rules regarding open banking in China. Therefore, due to the absence of feasible and mature legal framework, it is not reasonable for Chinese government adopt the compelling model. In addition, the compelling model is not proper due to the special financial market and regulation environment in China. The data opening of large commercial banks that occupy a dominant position in data can further expand their business, obtain cooperation opportunities, and win the dividends brought by data sharing, while small financial institutions with scarce customer information and poor data information face the dilemma of losing business resources and further expanding competitive disadvantages. If adopting the compelling regulation-driven model and forcing data sharing among all banks, it will strengthen the data integration of monopoly financial institutions and aggravate the centralization of financial data.[75] Also, e-commerce platforms and third-party payment businesses are well-developed in China. Internet financial enterprises optimizes financial business and provides financial services, which has gradually occupied more and more shares in the Chinese financial field, and even be able to compete with certain banks. According to the business model of open banking, one-way data openness is tantamount to creating an unequal competition where e-commerce platforms can rely on the richer data resources of financial institutions to develop more quickly, while traditional financial institutions such as banks are very easy to lose the advantages of basic data. Accordingly, the mandatory "regulatory-driven" model may affect the financial stability and exacerbate unfair competition in the financial market of China.[76]

ii. *Voluntary Model is not Appropriate for China*

Voluntary model is adopted by US which neither does not require regulators to force banks to share data, nor issue specific technical or data sharing standards. It is driven by the market where institutions make agreements about data sharing and relevant security, APIs standards. The voluntary "market-driven" model can achieve a balance of interests of all parties in the market. However, under this model, there is no effective financial data sharing standard and the enthusiasm of banks to carry out financial data sharing is not high since there is no government promotion, which is difficult to make breakthroughs.[77] US government

[70] Yang Dong & Cheng Xiangwen. Research on the data sharing mechanism of consumer-centered open banking. Financial Regulation Research. 2019.10. P104.
[71] Zhang Jian. Selection of Supervision Model for Open Banking Data Sharing in China. Zheng Fa Lun Cong. 2023.1. P69.
[72] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P626-628.
[73] Zhang Jian. Selection of Supervision Model for Open Banking Data Sharing in China. Zheng Fa Lun Cong. 2023.1. P69.
[74] Article 45 of the Chinese Personal Information Protection Act.
[75] Yang Dong & Cheng Xiangwen. Research on the data sharing mechanism of consumer-centered open banking. Financial Regulation Research. 2019.10. P105.
[76] Yang Dong & Cheng Xiangwen. Research on the data sharing mechanism of consumer-centered open banking. Financial Regulation Research. 2019.10. P105.
[77] Yang Dong & Cheng Xiangwen. Research on the data sharing mechanism of consumer-centered open banking. Financial Regulation Research. 2019.10.P104.

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intends to allow private enterprises to develop open banking rather than limiting their innovation ability by regulatory uncertainties, so it adopts this model.[78] However, due to the different cultures and financial market development, it is not proper for China to adopt the US model. Firstly, without regulation, public confidence in open banking might be impaired and this voluntary model may cause disorder in China's financial market due to the lack of uniform standards of data sharing. Secondly, without proper regulatory limitations, there might a risk of monopoly since large banks are free to make agreements regarding data sharing and impose barriers preventing Fintech companies from entering into the financial market, which might impair competition in the financial sector. Also, the absence of uniform standards would decrease the interoperability of open banking system, which may cause high negotiation fee due to the financial fragmentation in the market.[79] Furthermore, as discussed before, US adopted the market-driven model since US financial market is too fragmented and it is hard for regulators to design and respond quickly.[80] However, unlike US, Chinese financial market is not so fragmented and the Chinese PBOC has already issued several policies clarifying the data sharing standard. Therefore, the US market-driven model is not suitable for China due to difference in financial markets of two countries.

iii. *"Active Guidance" Regulatory Model is More Suitable for China*

In general, active guidance regulatory model should be applied in China, which not only can increase interoperability and reduce transaction costs, but also stimulate better development of open banking. As discussed before, under active guidance regulatory model, government regulators only issue relevant standards for open banking such as data sharing, instead of utilizing statutory legal authority to force banks to share data. On the one hand, issuing uniform standards under active guidance model can increase interoperability and reduce negotiation fees of banks and Fintech companies. As mentioned above, Chinese PBOC has issued several policies clarifying technical specifications and standards regarding data sharing and APIs of open banking including *Code for Security Management of Application Programming Interfaces (APIs) of Commercial Banks(2020)*, *Technical Specifications for the Protection of Personal Financial Information(2020)*, *Guidelines for Data Capacity Building in the Financial Industry (2021)* and *Financial Data Security Data Life Cycle Security Specification* (2021). These policies have set standards of open banking including data sharing and APIs, etc., which can increase interoperability. The Creating of a uniform interface or software standard could simultaneously reduce transaction costs and provide financial institutions with greater certainty about the liability risks and contract terms of data sharing.[81] On the other hand, issuing guidance can facilitate open banking development from a long-term perspective. It might take long time for China to construct a mature legal framework for open banking development, before that, it is reasonable for Chinese regulators to give guidance for monitoring open banking, providing technical standards and constructing infrastructure of open banking, which can reduce public confusion and increase confidence of consumers in open banking and therefore encouraging more parties to participate in this area. Therefore, during the transition period, it is better for China to adopt active guidance model to help the public accept open banking. After then, legislators can issue a better and more socially acceptable legal framework to statutorily force data sharing in open banking.

V. How to Establish the Legal Regulation Structure of Open Banking in China under the "Active Guidance" Model

Generally, under the active guidance model, Fintech companies should reform data and technologies in order to have the ability to connect with traditional financial institutions. For large commercial banks, they should change attitude and accept open banking mode, while for small and medium banks, due to the lack of sufficient technique powers, they should cooperate to construct their open banking platform. For better coordination between these parties in open banking practice, regulators should give the development direction and issue instructive rules, encouraging cooperation between banks and Fintechs while protecting privacy and data security of customers.[82]

It is required to issue some government instruction in standards setting and provide a feasible legal framework giving instructions to banks and TPPs,

[78] Steven T. Mnuchin & Craig S. Phillips. A FINANCIAL SYSTEM THAT CREATES ECONOMIC OPPORTUNITIES: NONBANK FINANCIALS, FINTECH, AND INNOVATION. Report to President Donald J. Trump. 2018. https://home.treasury.gov/sites/default/files/2018-07/A-Financial-System-that-Creates-Economic-Opportunities---Nonbank-Financi....pdf?mod=article_inline (Access on 10 May 2023).

[79] Cesare Fracassi & William Magnuson. Data Autonomy. 2021. Vand. L. Rev. 74. P354.

[80] Basel Committee on Banking Supervision. Report on Open Banking and Application Programming Interfaces. 2019. P8-9. Report on open banking and application programming interfaces (APIs) (bis.org) (Access on 11 May 2023).

[81] Cesare Fracassi & William Magnuson. Data Autonomy. 2021. Vand. L. Rev. 74. P357.

[82] China Ping An Bank and Boston Consulting Group. China Open Banking White Paper. 2021.P41-42.

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however, banks should not be forced to share data through legislation now. Currently, there is not a feasible legal framework for open banking regulation in China. For regulating and stimulating development of open banking and reducing social risks, it is necessary to improve current legal system to establish a feasible framework to facilitate data portability implementation and construct a multi-level regulatory system of open banking. Also, traditional regulatory method for privacy protection is insufficient in open banking, it is necessary to transfer to "data autonomy" approach for protecting privacy.

a) Issue Feasible Rules for Data Portability Implementation

Article 45 of *Chinese Personal Information Protection Act* (valid from November 2021) sets the basis of data sharing for consumers, which indicates that where individuals request access to or copy their personal information, the personal information handlers shall promptly provide it. If individuals request the transfer of personal information to their designated personal information processor, satisfying the requirements provided by the state internet information department, the personal information processor shall provide a channel for the transfer.[83] This clause seems to regulate the foundation of data portability, however, there are no other rules or legislations clarifying specific details and procedures for the implementation of data portability. Also, there are no regulations indicating the definition of data portability. These would be barriers to open banking development in China. A data-oriented financial regulatory system needs focus on creating interoperable standards for data sharing. Not only is it important to create clear ownership rights over data, and clear access rights, but also it is necessary to ensure that this data is stored and managed in standardized ways. Interoperability is integral to the proper functioning of a market in data, and without it, transaction costs and market leverage may threaten to impede competition within the sector.[84] Therefore, it is necessary to improve legislations to increase the feasibility of data portability and interoperability of open banking systems. As discussed before, Chinese PBOC has issued a series of policies clarifying the standards which increase interoperability from the perspective of technology. It is not difficult to technically promote data sharing, but it is more difficult to achieve comprehensive protection of data from a legal point of view. It is necessary to combine the powers of technology and legislation. Not only should we bring technology into the orbit of the rule of law and constrain its risks, but also utilize more technical methods to improve the protection level of data sharing security.[85] Currently, it is crucial to increase interoperability from legislative perspective to clarify the definition and condition of portability, the scope of shard information and accountability in open banking.

i. *Implementation details of data portability*

Article 45 of the *Chinese Personal Information Protection Act* is only a principal provision without sufficient operability. Chinese government and relevant institutions should issue detailed implementation rules as soon as possible, including the conditions, types, methods, costs, and risk prevention of data portability. Also, it is necessary to clarify the definition of data portability. Since open banking and data portability were introduced from UK and EU, it is reasonable to apply the definition of data portability in GDPR which indicates that "the data subject shall have the right to receive the personal data concerning him or her, which he or she has provided to a controller, in a structured, commonly used and machine-readable format and have the right to transmit those data to another controller without hindrance from the controller to which the personal data have been provided".[86]

ii. *Scope of shared information*

Also, it is required to clarify the scope of shared information. The shared information scope is distinct between different countries. In UK, it is required to provide information regarding the following accounts: transaction information for personal current account products, including personal current accounts; basic bank accounts, packaged accounts, reward accounts, student or graduate accounts, and youth accounts; and business current account products, including business current accounts. Under UK open banking, the CMA Order requires that the Read/Write Data Standard provides access to transaction information for covered accounts and initiates payments on behalf of customers on those accounts. The detail of the data to be shared, including the data fields for each of the accounts, is provided by the UK Standards.[87] However, the shared information in Australia is much broader. Australia's open banking rules apply to a wide array of consumer data, including product data, customer data, account data, and transaction data.[88] Australia intends to govern the sharing of data goes beyond the financial industry. The *Australian Consumer Data Right Bill* specified that

[83] Article 45 of Chinese Personal Information Protection Act.
[84] Cesare Fracassi & William Magnuson. Data Autonomy. 2021. Vand. L. Rev. 74. P353.
[85] Zhang Jian. Selection of Supervision Model for Open Banking Data Sharing in China. Zheng Fa Lun Cong. 2023.1. P71.
[86] Article 20 of General Data Protection Regulation. EU.
[87] Scott Farrell. Designing Data Rights for Canadian Open Banking Lessons from Banking Law in Australia and the United Kingdom. 2022. Sask. L. Rev.85. P182-183.
[88] Robyn Chatwood & Ben Allen. Australian Government Passes Consumer Data Right Legislation. 2019. https://www.dentons.com/en/insights/alerts/2019/august/8/australian-government-passes-consumer-data-right-legislation-on-1-august-2019 (Access on 9 May 2023).

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the financial industry would be the first industry to be regulated, but that other industries would also come under its rules.[89]

For China, currently, it is better to limit the shared information in financial industry due to the limitation of technologies and legal basis. Also, it is necessary to divide information according to its sensitivity and significance and gradually expand the scope of shared data based on the sensitivity level. According to *Chinese national standard "Information Security Technology Personal Information Security Specification*, "personal sensitive information" refers to "personal information that may endanger personal and property safety once leaked, illegally provided, or abused, and can easily lead to damage to personal reputation, physical and mental health, or discriminatory treatment."[90] It is necessary to limit the sharing scope of sensitive information and require desensitization treatment under some circumstances to protect privacy of consumers.

iii. *Accountability*

Accountability regarding open banking should be clarified, which can encourage institutions pay more attention to data protection and increase public confidence in open banking market. In Hong Kong, banks should burden to duty to conduct ongoing monitoring and due diligence of the TPPs they partner with and establish contractual terms that mitigate the risk that customer data will be misused.[91] Hong Kong believes that this approach will "strike a balance between innovation and consumer protection" because it requires banks to play a custodian-like role with respect to customer data.[92] China can also adopt this approach and impose responsibilities on banks to monitor Fintech and TPPs. However, the banks should not be the only accountable party, TPPs should also have the duty to protect consumers' data. Banks and their partners TPPs be jointly liable for data abuse, leakage or loss. Furthermore, regulators should issue a more unambiguous and detailed standard for data security protection and impose sanctions on data theft, leakage, abuse as well as the illegal usage of data without customers' consent.[93]

[89] Treasury Laws Amendment (Consumer Data Right) Bill 2019 (Cth). https://www.aph.gov.au/Parliamentary_Business/Bills_Legislation/Bills_Search_Results/Result?bId=r6281 (Access on 9 May 2023).

[90] China National Information Security Standardization Technical Committee. Information Security Technology - Personal Information Security Specification (GB/T 35273-2020).

[91] H.K. MONETARY AUTH. OPEN API FRAMEWORK FOR THE HONG KONG BANKING SECTOR. 2018. https://www.hkma.gov.hk/media/eng/doc/key-information/press-release/2018/20180718e5a2.pdf (Access on 8 May 2023).

[92] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P620.

[93] China Ping An Bank and Boston Consulting Group. China Open Banking White Paper. 2021. P44.

b) Construct a multi-level regulatory system for data sharing

i. *Current Legislation and Rules Regarding Data Sharing in China*

The main goal of China's implementation of open banking is promoting the digital transformation of financial institutions and fully tapping the value of data. Currently Chinese legislations and rules regarding data protection and data dealing. Firstly, Article 42 of the *Chinese Cybersecurity Law* expresses that network operators must not disclose, tamper with, or destroy the personal information they collect; and personal information shall not be provided to others without the consent of the person being collected. However, this is not the case where the specific individual cannot be identified after processing and cannot be restored. Network operators shall employ technical measures and other necessary measures to ensure the security of the personal information they collect and prevent information leakage, damage, or loss. When leakage, damage, or loss of personal information occurs or may occur, remedial measures shall be immediately employed, and users shall be promptly informed and reported to the relevant competent departments in accordance with provisions.[94] Secondly, Article 1038 of the *Chinese Civil Code* indicates that information processors must not disclose or tamper with the personal information they collect or store; without the consent of individuals, their personal information shall not be illegally provided to others, except where the specific individual cannot be identified after processing and cannot be restored. Information processors shall employ technical measures and other necessary measures to ensure the security of the personal information they collect and store, and prevent information leakage, alteration, and loss. When leakage, alteration, or loss of personal information occurs or might occur, remedial measures shall be promptly employed, and individuals shall be notified in accordance with provisions and reported to the relevant competent departments.[95] Thirdly, Article 23 of the *Chinese Personal Information Protection Law* more specifically regulates the data dealing and transferring issue. It indicates that where personal information processors provide information to other personal information operators, they shall inform the individuals of the name or surname and contact information of the recipients, purpose and methods of processing and types of personal information. Also, it is required to obtain the separate consent from them. The recipient shall process personal information within the scope of purposes, following processing methods and types of personal information. Where the receiving party changes

[94] Article 42 of the Chinese Cybersecurity Law.

[95] Article 1038 of the Chinese Civil Code.

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the original purpose or method of processing, it shall re-obtain the individual's consent in accordance with the provisions of this Law.[96] Furthermore, Article 29 of the Implementing Measures for the Protection of the Rights and Interests of People's Bank of China Financial Consumers shows that banks and payment institutions handling consumer financial information shall follow the principles of legality, propriety, and necessity, and obtain the express consent of financial consumers or their guardians, except as otherwise provided by laws and administrative regulations. Banks and payment institutions must not collect consumer financial information unrelated to business, must not use improper methods to collect consumer financial information, and must not covertly force the collection of consumer financial information. Banks and payment institutions shall not refuse to provide financial products or services on the grounds that financial consumers do not consent to the processing of their financial information, except where the processing of their financial information is necessary for the provision of financial products or services. Where financial consumers are unable or refuse to provide necessary information, making it impossible for banks or payment institutions to perform their anti-money laundering obligations, banks and payment institutions may take restrictive measures against their financial activities in accordance with the relevant provisions of the *Anti-Money Laundering Law of the People's Republic of China*. When it is truly necessary, banks and payment institutions may refuse to provide financial products or services in accordance with law.[97]

ii. *Establish a Multi-level Regulatory System of Data Sharing*

Although *Chinese Cybersecurity Law*, *Chinese Civil Code*, *Chinese Personal Information Protection Law* and the *Implementing Measures for the Protection of the Rights and Interests of People's Bank of China Financial Consumers* establish relevant legal basis for personal information sharing, but the above legal provisions obviously only focus on the protection of personal information rather than sharing information, and there lacks the encouragement and mandatory provisions for data sharing.[98] Therefore, there is no mature legal regime for data sharing in China. Except for government regulatory system, making use of the market and social power is also important. It is necessary to establish a multi-level regulatory system for data sharing which should contains supervising parties such as banks, TPPs, customers, social associations and judges.

Firstly, as discussed above, banks and TPPs should be jointly liable for data protection. Learning from the active guidance regulation model in Hong Kong, banks are supposed to supervise the data application actions of their TPPs, which can keep the balance between innovation and financial security. Secondly, Fintech companies and TTPs which receive the data should be mainly responsible for data protection. Therefore, it is necessary to require these companies to design internal supervision systems in their companies to prevent data loss or leakage. Thirdly, Chinese government should build a special compliant system for customers for dealing with matters relevant to data sharing issues in open banking. Social supervision from customers can play a crucial role in data sharing since customers are the party whose interests would be seriously impaired by data abuse. Therefore, it is necessary to authorize customers with compliant rights, which can also educate customers on the significance and value of data. Also, an open banking association should be established to deal with data sharing matter. As discussed before, open banking brings many challenges to the traditional regulatory system due to the information asymmetry and technical issues.[99] Therefore, it is necessary to organize the open banking association composed of technical and financial experts, which can better supervise data sharing matters and provide more information to government officials. The cooperation between associations and government regulators is significant for sound development of open banking. Finally, judicial aid is also necessary which is the last resort for customers. Currently, there is no specific Statutory Financial Interpretation regarding open banking judicial practice. However, data sharing matter is relevant to privacy and personal information protection and therefore, judges can refer to the rules, Statutory Financial Interpretation and legislation relevant to personal data and privacy in *Chinese Personal Information Protection Act*, *Chinese Civil Code* and other relevant legislations. In general, it is reasonable to establish a multi-level regulatory system including different monitoring bodies for data sharing in open banking.

c) *Data Privacy Protection: From "Notice-Consent" to "Data Autonomy"*

Traditionally, financial privacy laws in many countries follow a "notice and consent" model, which requires enterprises to notify consumers of their data collection practices and give consumers the option to opt-in or out. However, the "Notice-Consent" approach has significant structural flaws that limit its efficacy.[100]

[96] Article 23 of the Chinese Personal Information Protection Law.
[97] Article 29 of Implementing Measures for the Protection of the Rights and Interests of People's Bank of China Financial Consumers.
[98] Wen Shuying. Open Banking Regulation in UK and the Lessons from Its Experience. Journal of Shanxi University (Philosophy & Social Science). 2023. 46 (2). DOI:10.13451/J.cnki.shanxi.univ(phil.soc.).
[99] Xuan Di & Fang Yan. Risk Challenges and Legal Regulations of China's Open Banking Data Sharing. Credit Reference. 2022.7 (282). P42.
[100] Daniel J. Solove. Privacy Self-Management and the Consent Dilemma. 2013. HARV. L. REV. 126. P1886-1888.

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Notice and consent laws place an unmanageable burden on consumers by requiring them to read lengthy and often opaquely-written privacy policies, which consumers do not have time to read and often struggle to understand.[101] Moreover, even if consumers had the time to read all of the privacy policies that they are presented with in a given day, they are often unable to assess the risks of sharing their data.[102]

Better protecting customer privacy in digital economy era requires us to replace the traditional "data privacy" with a more comprehensive concept "data autonomy." Data autonomy grants customers a set of rights over their data that wrests control over data back from the large financial institutions that, until now, have maintained a vice grip over it. It can satisfy the data protection requirement and secure information be accessible and shareable, which is more consistent with open banking development trajectory. While data autonomy requires important changes in legal rights and responsibilities, it is better matched with "open banking" rules.[103] Authorizing customers with greater control of data sharing could potentially mitigate the traditional privacy protection problems brought by "notice-consent" regulation method.[104] If consumers can affirmatively decide and continuously control which company can have access and use their financial data, they will have a greater ability to preserve their personal expectations of financial privacy when they share their data with a third party.[105]

However, there are still certain risks of "data autonomy".[106] Firstly, similar to traditional "notice-consent" regime, consumers are generally unable to independently manage their data privacy due to the lack of time and knowledge to understand what most companies do with their data. Secondly, as more companies access personal financial data, consumers will find it increasingly difficult to keep track of how their data are used or who has access to it, this might increase the privacy risk and it is hard for customers to find accountable parties.[107] Thirdly, there is tension between consumer privacy and the economic interests of banks and certain companies that collect personal financial data to maintain a competitive edge.[108] Those economic interests can disincentivize these enterprises from giving consumers meaningful control of their data.[109] Under "active guidance" model without compelling data sharing, it might be difficult for banks to support the "data autonomy" approach.

Therefore, it is important for legislators and policy makers to strike a balance in this regard. Although the desires of consumers should dictate how their data are used, companies should not be foreclosed from reasonably using data to improve their own services or from fulfilling regulatory compliance obligations.China can learn from UK for balancing the interests between the bank and customer. UK Although U.K. regulations allow consumers to choose how their data are used, they do not prevent Fintech companies from providing innovative services. Rather, they require TPPs to explain their services clearly and allow consumers to select their desires. The third parties are only authorized to use and share personal data which is necessary to provide the requested services or for other reasonable purposes.[110] Generally, U.K. rules play a role in offsetting the tension between banks and customers by allowing consumers to affirmatively choose and continuously control which parties access their data, through centralized licensed platforms.[111] Learning from UK, Chinese regulations should limit the scope of data usage and balance the data application between banks and TPPs. Also, it is necessary to establish centralized platforms and require platforms to obtain licenses before helping customers share data, which can help regulators pre-cautiously reduce data abuse risk and provide timely remedies for data abuse.

VI. Conclusion

Open banking has been developed rapidly in China, although Chinese government issue many policies regarding open banking, there is not a clear legal regulatory framework. Although open banking benefits Chinese economy development, it also brings

[101] Privacy Rights and Data Collection in a Digital Economy. 2019. hearing | Hearings | United States Committee on Banking, Housing, and Urban Affairs (senate.gov) (Access on 11 May 2023).
[102] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P613.
[103] Cesare Fracassi & William Magnuson. Data Autonomy. 2021. Vand. L. Rev. 74. P332-333.
[104] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P626.
[105] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P626.
[106] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P626-628.
[107] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P626-628.
[108] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P626-628.
[109] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P626-628.
[110] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P629.
[111] Charles Marshall Wilson. DATA SHARING IS CARING CONSUMER PRIVACY AND INTERNATIONAL APPROACHES TO OPEN BANKING. 2022. Geo. Wash. Int'l L. Rev. 53. P630.

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some risks at the same time. Therefore, it is urgent to establish an effective regulatory system in China. Through learning from regulation forms in other jurisdiction, "active guidance" regulatory model should be more appropriate. Currently, without sufficient legal basis, it is reasonable to adopt the "active guidance" regulatory model, which can reduce the risk of disorder in the financial market and decrease negotiation costs among banks and TPPs. Therefore, the "active guidance" model can help open banking improve during the transition period. Under this model, current Chinese regulatory and legal regime needs to be improved as well. It is suggested to issue more feasible rules for data portability implementation, establish a multi-level regulatory system for data sharing including different supervision parties, as well as transfer the data privacy protection regime from traditional "Notice-Consent" to "Data Autonomy" model.

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Entrepreneurship as a Lever for Growth and Endogenous Development in Low-Density Territories

By Fernanda Maria Bizarro Policarpo, Ricardo Maria Hernandéz Mogóllon, Marí Ángeles Revilla Camacho & Antonio Fernandéz Portillo

Universidad de Extremadura

Abstract- From the analysis of GEM data, in relation to the Portugal-Spain border space, more specifically Alentejo-Extremadura, we tried to assess whether the development of entrepreneurial activities was affected by its territorial context. This being one of the least developed borders in the whole European Union (EU) and a problem for territorial cohesion, leading to the definition of policies and lines of support for its development, we try to understand whether entrepreneurship, a major factor in the development of the territory, followed the position of the respective countries or if there is a divergent performance. Entrepreneurship, increasingly pointed out as a means of enhancing the development of regions, either through job creation or through innovation, allows the inversion of the vicious cycle of low-density territories. The study of entrepreneurship in these regions, important for the perception of the relevant variables of this dynamic, is fundamental in this region in particular, since it is one of the regions of the EU with the lowest socio-economic development rates, being pointed out as an area of low density in which entrepreneurial captivity may be the driving force behind this situation.

Keywords: frontier, entrepreneurial activity, gem, territorial cohesion, regional development.

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Entrepreneurship as a Lever for Growth and Endogenous Development in Low-Density Territories

O Empreendedorismo Como Alavanca do Crescimento e Desenvolvimento Endógeno em Territórios de Baixa Densidade

Fernanda Maria Bizarro Policarpo [α], Ricardo Maria Hernandéz Mogóllon [σ], Marí Ángeles Revilla Camacho [ρ] & Antonio Fernandéz Portillo [ω]

Resumo- A partir da análise de dados GEM, em relação ao espaço de fronteira Portugal-Espanha, mais concretamente Alentejo-Extremadura, tentamos aferir se o desenvolvimento das atividades empreendedoras era afetado pelo seu contexto territorial. Sendo esta, uma das fronteiras menos desenvolvidas de toda a União Europeia (UE) e uma problemática paraa coesão territorial, conduzindo à definição de politicas e linhas de apoio ao seu desenvolvimento, tentamos perceber se o empreendedorismo, fator de relevo no desenvolvimento do território, seguia a posição dos países respetivos ou se apresenta uma performance divergente. O empreendedorismo, cada vez mais apontado como um meio de potenciar o desenvolvimento de regiões, quer através da criação de emprego quer através da inovação, permite a inversão do ciclo vicioso dos territórios de baixa densidade. O estudo do empreendedorismo nestas regiões, importante para a perceção das variáveis de relevo dessa dinâmica, é fundamental nesta região em particular, uma vez que ela é uma das regiões da UE com índices de desenvolvimento socioeconómicos mais baixos, sendo apontada como uma área de baixa densidade em que a catividade empreendedora poderá ser o motor de inversão dessa situação. A partir do estudo dos dados GEM e de dados estatísticos caracterizadores da região, utilizando uma metodologia analítico-sintética, foi possível perceber a sua realidade, no sentido de incrementar a atividade, determinante para todos os agentes e decisores, bem como para o desenvolvimento regional. Concluímos, que a existência em tempos de uma fronteira, criou características que o tempo ainda não corrigiu e que influem na AE da região.

Palavras-chave: fronteira, atividade empreendedora, gem, coesão territorial, desenvolvimento regional.

Abstract- From the analysis of GEM data, in relation to the Portugal-Spain border space, more specifically Alentejo-Extremadura, we tried to assess whether the development of entrepreneurial activities was affected by its territorial context. This being one of the least developed borders in the whole European Union (EU) and a problem for territorial cohesion, leading to the definition of policies and lines of support for its development, we try to understand whether entrepreneurship, a major factor in the development of the territory, followed the position of the respective countries or if there is a divergent performance. Entrepreneurship, increasingly pointed out as a means of enhancing the development of regions, either through job creation or through innovation, allows the inversion of the vicious cycle of low-density territories. The study of entrepreneurship inthese regions, important for the perception of the relevant variables of this dynamic, is fundamental in this region in particular, since it is one of the regions of the EU with the lowest socio-economic development rates, being pointed out as an area of low density inwhich entrepreneurial captivity may be the driving force behind this situation. From the study of the GEM data and statistical data characterizing the region, using an analytical-synthetic methodology, it was possible to perceive its reality, in the sense of increasing the activity, determinant for all agents and decision makers, as well as for regional development. We conclude that the existence in times of a frontier created characteristics that time has not yet corrected and that influence the region's EA.

Keywords: frontier, entrepreneurial activity, gem, territorial cohesion, regional development.

I. Introdução

O objetivo fundamental deste estudo, foi o de perceber se a fronteira ainda influi nas diferentes iniciativas empreendedoras e de que forma isso acontece. A fronteira Alentejo-Extremadura, é cada vez mais uma região socialmente deprimida resultando daí possibilidades e capacidades de cooperação substancialmente reduzidas (Reigado, 2013). Numa situação de periferia geográfica, económica e política, é um espaço marginal muito distanciado dos centros de decisão nacionais, regionais e também dos centros de consumo (Carrera Hernández, 2013). Por outro lado, transformar uma fronteira que divide numa fronteira que une, potenciando uma maior coesão territorial, foram e continuam a ser os grandes desígnios da cooperação territorial europeia (Soeiro, Beltrán, Cabanas, Lange, Mao, & Masarova, 2016), dai a necessidade de fomentar o empreendedorismo como forma de a desenvolver.

Neste trabalho tentamos aferir se o empreendedorismo, nas duas regiões de fronteira, é semelhante entre si e em relação aos seus países de origem, ou se por contrário as suas evoluções são tão dispares que revelam a pouca preocupação que existe

Author α: Instituto Politécnico de Portalegre[1]. e-mail: policarpo@ipportalegre.pt
Author α ω: Universidad de Extremadura. e-mails: rhernand@unex.es, antoniofp@unes.es
Author ρ: Universidad de Sevilla. e-mail: arevilla@us.es

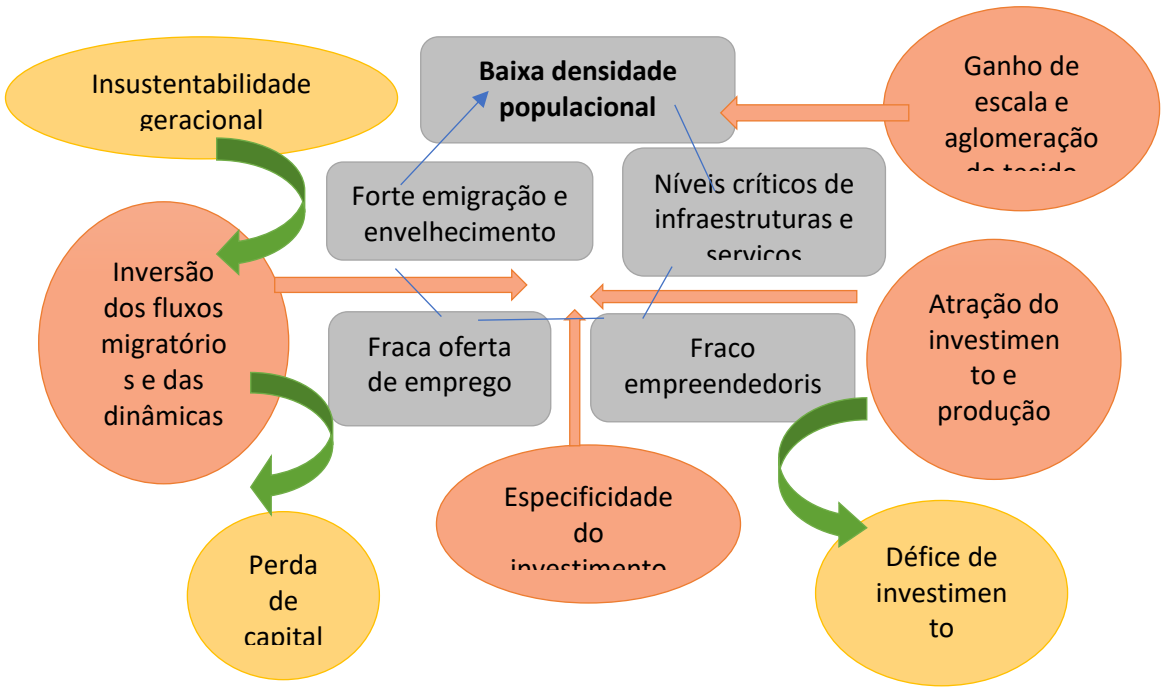
[1] Autor de correspondencia.

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em potenciar estas iniciativas no território. Para essa análise utilizamos dados estatísticos sobre as regiões e os dados GEM, tentando caracterizar tanto os territórios como a sua atividade empreendedora.

II. A Fronteira

Sendo esta uma região em que os esforços da UE para nivelar o seu desenvolvimento, relativamente à média europeia, parecem não ter o efeito pretendido, foi possível aferir alguns dos entraves ao desenvolvimento da atividade empreendedora, num território em que estas iniciativas são preponderantes para inverter a sua trajetória. Entendendo que o efeito da existência de uma fronteira conduziu ao desenvolvimento de um território de baixa densidade, económica e socialmente débil, é importante fomentar o empreendedorismo e a cooperação entre as áreas geográficas de forma a potenciar o seu desenvolvimento económico e social.



Fonte: Elaboração própria

Figura 1: Quebra do ciclo vicioso dos territórios de baixa densidade

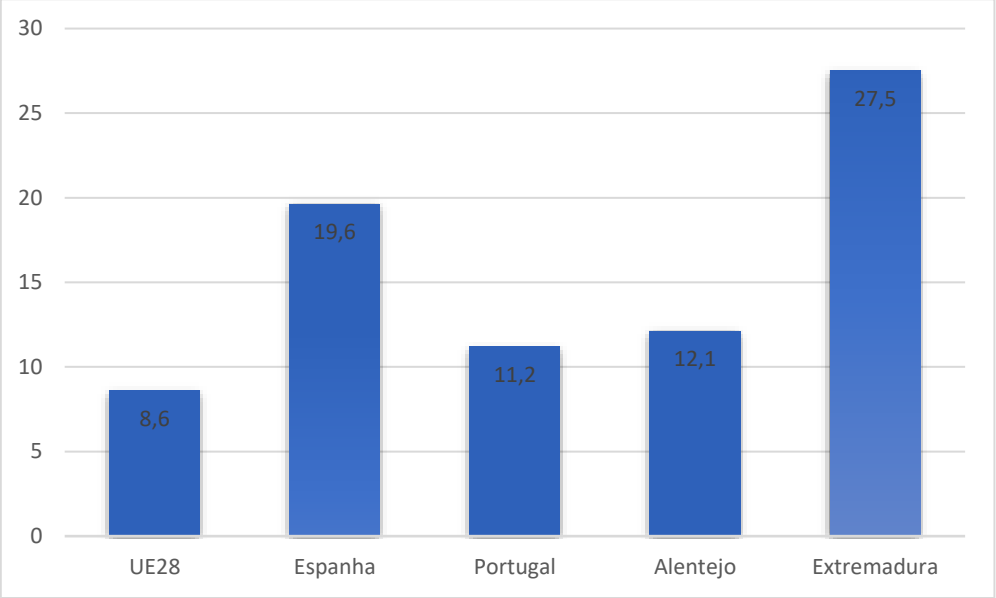
A fronteira, criando uma influência especifica na envolvente, que diverge em intensidade e tipo, de território para território, dependendo dos processos de interação e integração entre os diversos atores e agentes locais, conduziu a desenvolvimentos económicos distintos que importa entender. Esses desenvolvimentos distintos ou descontinuidades espaciais (acesso difícil), físicas (rios, montanhas, mares), culturais, linguísticas (diferentes línguas), demográficas, sociais e económicas, resultam em barreiras que diminuem as oportunidades de cooperação, afetando o crescimento e desenvolvimento dessas regiões (CE, 2016).

Nesse sentido, importam no aumento dos custos de transação, em barreiras linguísticas, na divisão de áreas de influência, em custos alfandegários e em potenciais conflitos políticos e militares (Anderson & O´Dwod, 1999).

Com efeito, nas regiões de fronteira, o efeito barreira visto que engloba obstáculos e descontinuidades de acessibilidades importantes que favorecem a fragmentação das áreas de mercado e a duplicação de serviços, o que se materializa em (des) economias de escala (Suárez-Villa, Giaoutuzi & Stratigea, 1991), apesar da linha de fronteira não passar de um artificialismo humano (Policarpo, F. & Hernández, R., 2015, p.110)

Neste caso, sendo regiões de fronteira com características de regiões periféricas, localizadas longe de áreas metropolitanas centrais e de grandes mercados dinâmicos (Arbuthnott & von Friedrichs, 2013), apresentam efeitos de perda e fragilidades, quer por via da penalizadora evolução da sua população, diferentes regimes laborais e fiscais, quer pela ausência de estratégias coletivas e concertadas de coesão económica e social (Natário *et al.*, 2018).

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Fonte: Elaboração própria, com base em ine.es e ine.pt

Gráfico 1: Taxa de Desemprego – 2016

A taxa de desemprego na região da Extremadura, em 2016, situou-se em mais do dobro da região Alentejo, continuando acima da média do seu país em quase 8%. Por sua vez, o Alentejo mantém-se acima da média nacional, em cerca de 1%. Os dois países estão acima da taxa média da UE, contudo a Espanha, com mais do dobro, cerca de 11% mais. Tal como a CCRA (Comissão de Coordenação da Região Alentejo) reconhece no documento de apresentação do Pacto Territorial para o desenvolvimento e o Emprego no Alentejo (Galego, Alegria & Garcia, 1988), esta região possui uma série de constrangimentos ao seu desenvolvimento, nomeadamente:

1. Elevados níveis de repulsão e envelhecimento, com a consequente perda de vitalidade demográfica;
2. Reduzidos níveis de qualificação e instrução de recursos humanos;
3. Elevado número de pessoas desempregadas e sub-empregadas;
4. Reduzida diversificação da base económica com grande dependência do sector agrícola, dos serviços públicos e das transferências de rendimento;
5. Debilidade do tecido empresarial.

Entre 2013 e 2017, os valores do salário mínimo mensal (considerando a remuneração anual dividida por 12) em Portugal e em Espanha aumentaram, respetivamente, de 566 € para 650 € e de 753 € para 826 €. É claro o contraste com os valores mínimo e máximo existentes na UE no mesmo período: a Bulgária passou de 159 € para 235 € e o Luxemburgo de 1 874 € para 1 999 € (OCDE, 2017).

O nível de instrução dos empregados no ano 2016 era claramente mais elevado em Espanha (43,2% possuíam um grau de ensino superior) do que em Portugal (44,0% não tinham ido além do 3.º ciclo do ensino básico).

Face ao exposto, e analisando o quadro abaixo apresentado, é factual que o índice de população desempregada seja maior nas regiões em estudo do que nos países de que fazem parte, apresentando a Extremdura um valor mais do dobro do Alentejo.

Quadro 1: População, Emprego, e Desemprego - 2016

Milhares	População Ativa	População Empregada	População Desempregada	Ind. Pop. Ativa	Ind. Pop.Des
Espanha	22.823	18.813	3.487	49	15
Extremadura	463	357	106	43	30
Portugal	5.178	4.605	573	50	11
Alentejo	343	302	41	45	12

Fonte: Elaboração própria com base em, www.pordata.pt/Portugal/Densidade+populacional+segundo+os+Censos-412

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Com base no estudo de Vaz, Barbosa, Cesário e Guerreito (2003) sobre a atratividade regional das zonas rurais do sul da Europa, onde se inclui as áreas em análise, identificaram-se um conjunto indicadores de atratividade regional de todos os países do sul da Europa, por regiões, os quais foram classificados (a Itália foi excluída devido ainconsistências de dados) em três grupos de acordo com o quadro 2 abaixo apresentado. Estes três grupos, criados com base nas características regionais de atratividade para as empresas, sendo o primeiro grupo, aquele em que se insere a região Alentejo, o que respeita a condições de atratividade para negócios inadequadas, o segundo, o que apresenta algum potencial de crescimento começando a indicar uma atratividade média; e, onde se insere a Extremadura, e finalmente, o terceiro grupo, o que mostra ter condições de sucesso para estabelecer estruturas e mantê-las auto-sustentáveis e estáveis.

Quadro 2: Atractividade regional

Cluster 1 Inadequate conditions	Cluster 2 Potencial for growth	Cluster 3 Successful conditions
Anatoliki Makedonia, Thraki	Attiki	Champagne
Kentriki Makedonia	Galicia	Picardie
Dytiki Makedonia	Asturias	Haute-Normandie
Thessalia	Cantabria	Centre
Ipeiros	Pais Vasco	Basse-Normandie
Ionia Nisia	Navarra	Bourgogne
Dytiki Ellada	Rioja	
Sterea Ellada	Aragón	
Peloponnisos	Madrid	
Voreio Aigaio	Castilla-La Mancha	
Notio Aigaio	Extremadura	
Kriti	Cataluña	
Baleares	Comunidad Valenciana	
North	Andalusia	
Centro	Murcia	
Alentejo	Canarias	
Algarve	Lisbon and Tagus Valley	
Azores		
Madeira		

Fonte: Elaboração própria, com base em Vaz et al., 2003

Face ao estudo, o Alentejo e a Extremadura, situam-se em diferentes grupos ao nível da atratividade para as empresas, apresentando estruturas socioeconómicas e de governaçãodistintas.

O Alentejo está incluído no grupo de regiões de baixa e constante perda de densidade populacional, com poucos centros urbanos, fracas acessibilidades, baixo nível de investimento privado e no que diz respeito às atividades de investigação e desenvolvimento (I & D), estas são poucas e basicamente apoiadas pelo setor público. Também neste cluster verifica-se falta de qualificação da mão de obra o que afeta a procura por parte das empresas levando à falta de estabilidade dos empregos. O

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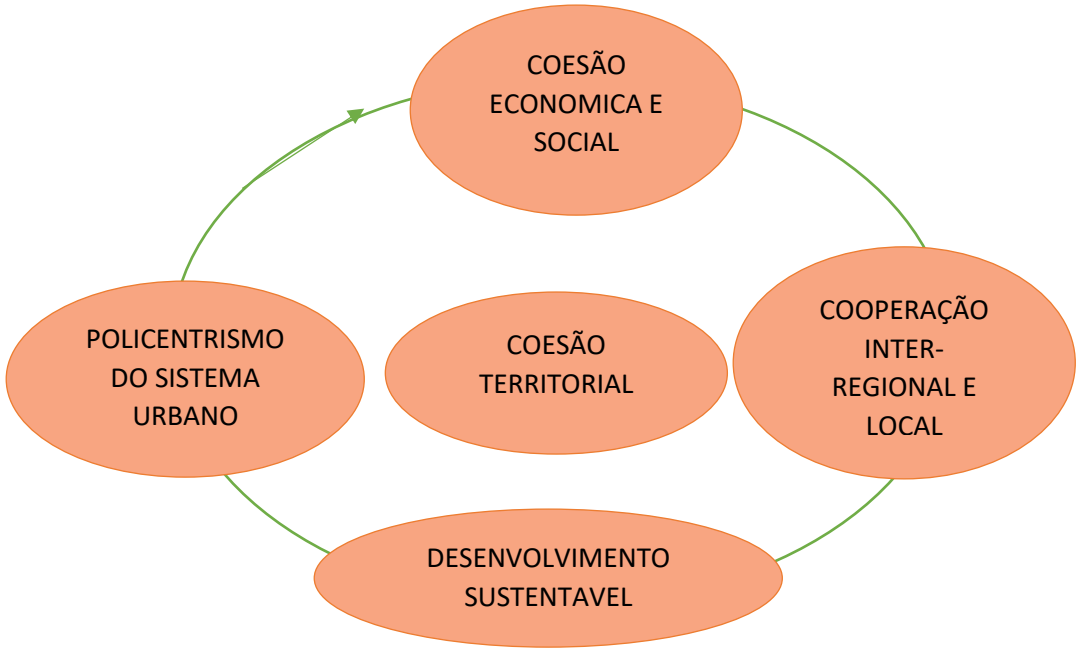
segundo grupo observado inclui a Extremadura, integra regiões com bons acessos, níveis de formação mais elevados, maiores centros urbanos o que potencia a densidade populacional, maior esforço em I & D, estando as empresas localizadas neste grupo cientes da sua importância, denotando sinais de querer integrar essas atividades nos seusprocessos de produção.

Por outro lado, convêm não esquecer, que quando uma fronteira separa duas regiões económica e socialmente deprimidas, como as regiões em estudo, as possibilidades e capacidades de cooperação são substancialmente reduzidas (Reigado, 2009).

Desde as alterações ocorridas em Portugal e Espanha com a integração europeia, assistimos a uma alteração dos comportamentos, face à fronteira e na fronteira, devido, essencialmente, à livre circulação de pessoas, capitais e mercadorias aprovada entre alguns países da União Europeia no Tratado de Schengen (1985) (Lima, 2012, p.79).

Nos dias de hoje, as fronteiras, assumem cada vez mais um valor estratégico de controlode mercados e de competitividade supranacional. Por isso, a União Europeia(UE) considera-as como lugares especiais de aplicação de políticas públicas orientadas para o desenvolvimento, por onde passa o desafio da atenuação de diferenças internas e de reforço da coesão (Lima, 2012).

Certo é que o processo de integração política e territorial que ocorreu por quase toda a Europa, conduzindo à abertura das fronteiras permitiu, consequentemente, o aumento da sua permeabilidade (Janeco, 2015). Por esse facto, as regiões de fronteira alcançaram uma posição de especial interesse, não só pelas questões de soberania nacional, mas, também, pela cooperação entre populações, com vista a uma maior coesão e desenvolvimento (UE,2007).



Fonte: Elaboração própria

Figura 2: Componentes estruturantes da coesão territorial

A coesão territorial, prevista no Tratado de Amesterdão (1997), representa a adoção de outro quadro conceptual que entende o território como uma dimensão ativa do desenvolvimento, situada ao mesmo nível que os processos sociais e económicos (André, 2002). Nesse sentido, o Tratado de Lisboa (2007) e a Estratégia Europa 2020, inseriram uma nova vertente na estrutura da coesão territorial, defendendo assim uma das suas principais ideias, a de uma Europa sem fronteiras vocacionada para a cooperação territorial (Isidro, 2013).

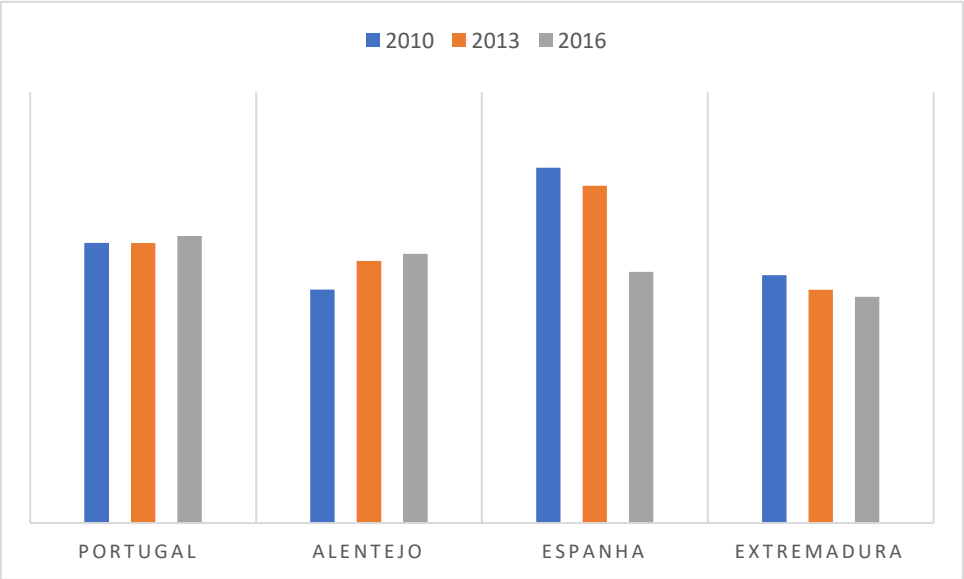
"Contudo, os processos de cooperação transfronteiriça a nível ibérico, apesar do seu dinamismo inegável, não estão a progredir e a desenvolver-se tão rapidamente como noutras regiões da Europa" (Castanho, Loures, Cabezas & Fernández-Pozo, 2017, p.1). Por seu lado, as desejadas convergências, em particular nas regiões de fronteiras, não têm sido conseguidas pelos diversos quadros comunitários (QCA) na medida em que continuam a existir disparidades regionais, (Fath & Hunya, 2001; Santamaría & Pires,2016).

Porém, a Comissão Europeia (2016) considera que a região de fronteira Espanha-Portugal está integrada no grupo das fronteiras europeias com maior potencial de competitividade e de integração de

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mercado. Sendo um espaço de trocas, de resiliências e de conflitos, de hibridismos culturais, onde diferentes quadros fiscais, lógicas de governação e políticas criaram condicionalismos específicos, que afetam os fluxos internacionais gerados e os potenciais desenvolvimentos, face aos enquadramentos político-administrativos existentes (Fernandes, Natário & Braga, 2016).

Porem, apesar da abolição da fronteira, ainda são apontados como potenciadores so seu efeito os seguintes aspetos: diferentes níveis de desenvolvimento que, marcando o sentido de mobilidade, podem potenciar contra-corrente em situações de desequilíbrios intersectoriais (por. ex. diferentes preços); entraves à mobilidade dos fatores, como sejama língua, a cultura, a legislação e diferentes sistemas de proteção social; deficiente circulação de informação (por ex. sindicatos e empresários); intensidade e sentido da mobilidade dos capitais devido à legislação referente ao investimento e politica de crédito, nível de desenvolvimento tecnológico e eficiência dos serviços de administração publica; ofertas concorrentes de produtos e serviços originadas pela semelhança de recursos e de estruturas económicas dos dois lados da fronteira (Reigado, 2009).



Fonte: INE.pt; Pordata

Gráfico 2: Evolução do PIB Regional

Para Baptista (1985), o processo de estagnação económica no Alentejo resulta quer de fatores de natureza geomorfológica e climática, quer de outros, de ordem sociopolítica.

Este processo caracteriza-se pela desvalorização dos recursos regionais, conduzindo a uma diminuição das vantagens locativas, do potencial do mercado, e de iniciativa endógena, com os consequentes baixos níveis de investimento e de modernização da estrutura produtiva.

O tecido produtivo do espaço fronteiriço em análise é caracterizado por empresas de muito pequena dimensão, microempresas de cariz familiar, com um número muito reduzido de pessoas ao serviço, o que significa que há maiores dificuldades para a obtenção de financiamentos e para investimentos externo. Estas são pouco diversificadas e com peso pouco significativo, centrando-se, fundamentalmente, em serviços básicos e exploração de recursos naturais endógenos (Soeiro *et al.,* 2016).

A produtividade destas áreas situa-se 18% abaixo da média da EU, sendo que as áreas com mais dinamismo são as com maior densidade populacional e com um capital humano mais qualificado. O carácter rural e periférico do território, a existência de numerosos núcleos urbanos de reduzido tamanho e a dispersão da população geram problemas adicionais às PMEs instaladas no território (Castro, 2013). Pequenos negócios apresentamescassos valores de crescimento/ índices de desenvolvimento.

De acordo com estudos anteriores, algumas explicações são comumente dadas para este fato: a fraqueza do tecido económico e de negócios, a fraca capacidade de atrair novos negócios, dificuldade de acesso aos principais mercados, menor capacidade de comunicação com centros de decisão e até mesmo a simples falta de empreendimento naquelas áreas (Castanho *et al.,* 2017).

Por outro lado, o capital investido leva muito tempo a recuperar o que representa um problema para

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os investidores, para além de constituir um processo muito burocratizado, o que agrava a implementação formal e funcional da iniciativa empreendedora (Macias, Rodríguez, Fernandes, Natário & Braga, 2014).

Numa região com povoamento disperso, forte ruralidade e decréscimo de população, a agricultura permanece como atividade relevante. A taxa de atividade inferior às médias nacionais, é potenciadora do maior nível de desemprego e é afetada pelo analfabetismo superior às médias dos respetivos países. Desta realidade destaca-se Badajoz que vêm contrariar alguns destes indicadores, sendo a cidade mais próxima da fronteira em análise. O número de empresas destas regiões não tem crescido significativamente ao longo do tempo, o que se deve essencialmente à já existente debilidade do tecido económico e empresarial e ao facto deste espaço ter características pouco atrativas para a fixação de novas empresas. Dificuldades de acesso a grandes mercados, menor capacidade de discussão com os centros de decisão e falta de capacidade de iniciativa caracterizam esteespaço.

Em relação a Portugal, o Alentejo Interior apresenta apenas cerca de 4% do total de empresas do país, sendo que destas 98% são microempresas, em que o emprego médio éna ordem de 2,5 trabalhadores por empresas, número inferior ao observado no país. Apenas 5,6% são indústrias transformadoras. Num total de 15 milhares de euros, o PIB *per capita* regional apresenta valor inferior ao registado no país.

Quanto ao pessoal ao serviço e ao volume de negócios, no Alentejo Interior, estas percentagens descem para 5,3% e 4,2% em relação aos valores nacionais.

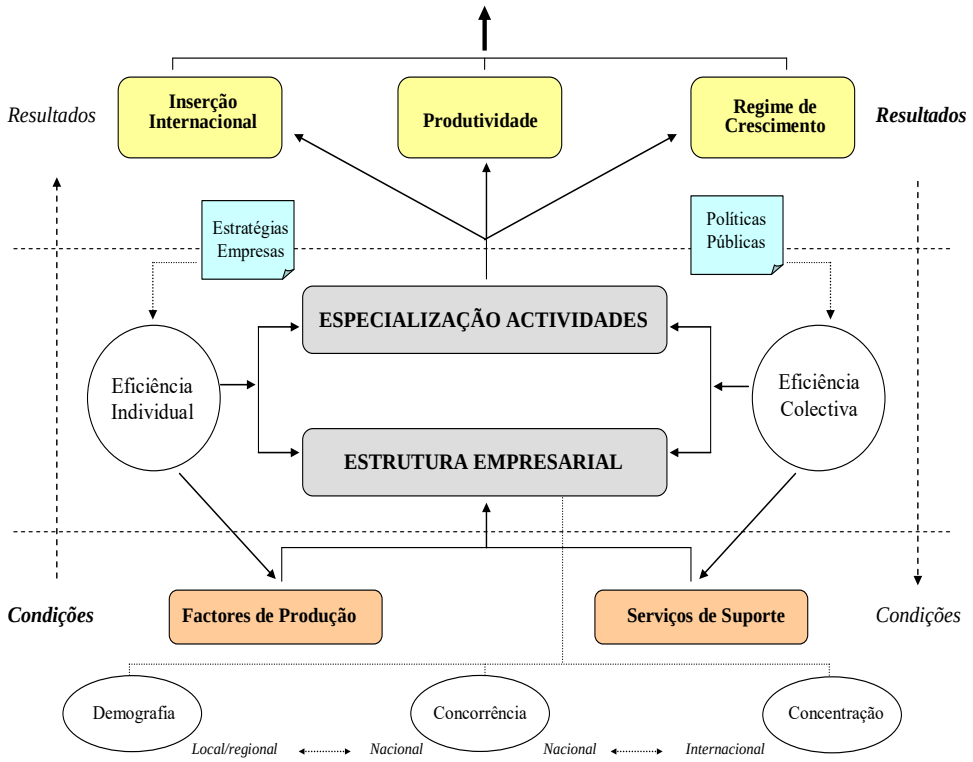
Em relação a Espanha, na Extremadura a importância do setor dos serviços sobressai na estrutura económica desta comunidade, tendo vindo a substituir o peso que o setor primário tinha nessa região ao longo das últimas décadas. Apenas 8% são indústrias transformadoras, sendo que as empresas de serviços (sector com maior peso, 57%) e de comércio, no seu todo, representam 79% do tecido empresarial. O tecido empresarial desta Comunidade Autónoma, cerca de 2% do total de empresas do país, caracteriza-se pelo facto de cerca de 65% das empresas existentes possuírem apenas um ou dois trabalhadores e mais de 20% contar com menos de 5 trabalhadores, existindo apenas cerca de dez empresas com mais de 500 trabalhadores. Os principais subsetores industriais sãoo agroindustrial, o energético, a cortiça e o têxtil.

Pelo exposto, estas regiões tendem a apresentar condições menos favoráveis à criação e desenvolvimento de atividades empresariais (Oinas & Malecki, 1999), pelo que o nosso estudo visa entender a incidência no empreendedorismo da localização na zona de fronteira, como forma de conhecer alguns desses constrangimentos regionais. Só através da sua identificação é possível apontar soluções que permitam a criação de uma nova dinâmica territorial, dependente da interferência e da habilitação dos atores locais e regionais, na exploração de fatores endógenos comuns, aproveitando a criação do mercado único.

III. Actividade Empreendedora

Sendo importante para o seu desenvolvimento enquanto região, mas também do país que integra, o relacionamento entre estas regiões e num contexto de rápidas mudanças tecnológicas, de globalização das economias, e em que, simultaneamente, é atribuída uma importância acrescida, para que as regiões incrementem a sua competitividade, através das caracteristicas locais, é necessário fomentar o empreendedorismo e a inovação nestas regiões, para que explorem sinergias resultantes da sua localização (Fig. 3). Entende-se, assim, que "as estratégias e ações a promover devem reconhecer as especificidades territoriais com que os atores económicos e sociais se debatem, a valorização dos recursos, produções e saber-fazer locais, numa visão de internacionalização e cooperação a uma escala transnacional" (Fernandes, Natário & Braga, 2016, p. 3).

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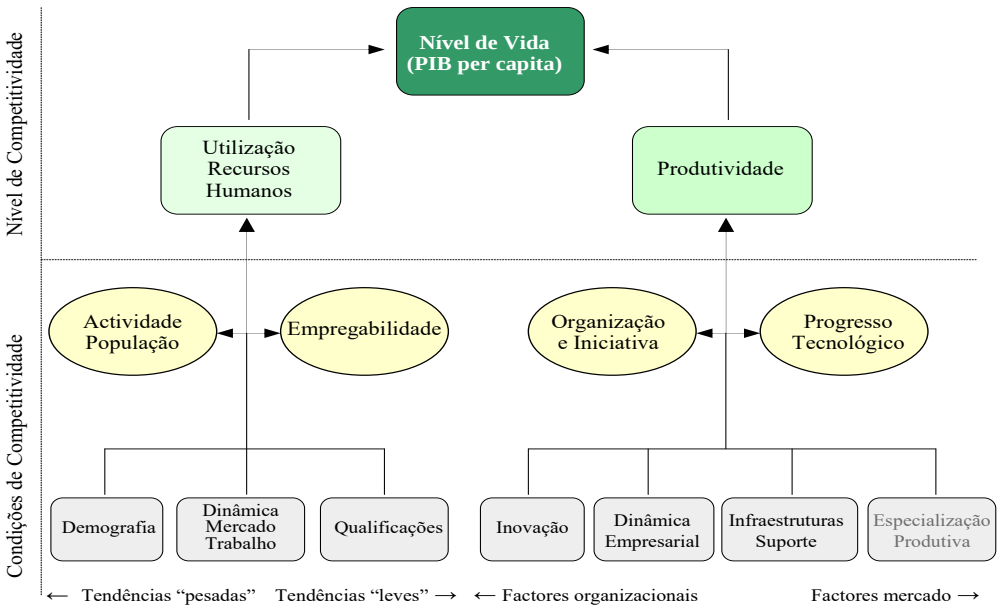


Fuente: Elaboração própria, com base em Mateus & Associados, 2005

Figura 3: A Competitividade como articulação da eficiência coletiva e individual

Contudo, o desenvolvimento do ecossistema empreendedor exige uma série de recursos e um novo modelo educacional e cultural que favoreça e incentive o espírito empreendedor. De facto, nos últimos anos, devido essencialmente à intensa crise vivida, o empreendedorismo tem ganho relevo, uma vez que é parte fundamental da solução no atual cenário económico.

Por outro lado, se a atividade empresarial fomenta a competitividade regional (Fig. 4.), é necessário empreender em contextos deprimidos e pouco inovadores, como forma de aumentar o emprego e melhorar o rendimento dos cidadãos (Barata, 2013), potenciando a criação de emprego e riqueza e criando igualmente valor social (Fernández-Laviada, Peña, Guerrero & González, 2014).



Fonte: Elaboração própria, com base em Mateus & Associados, 2005

Figuras 4: Pirâmide da competitividade regional

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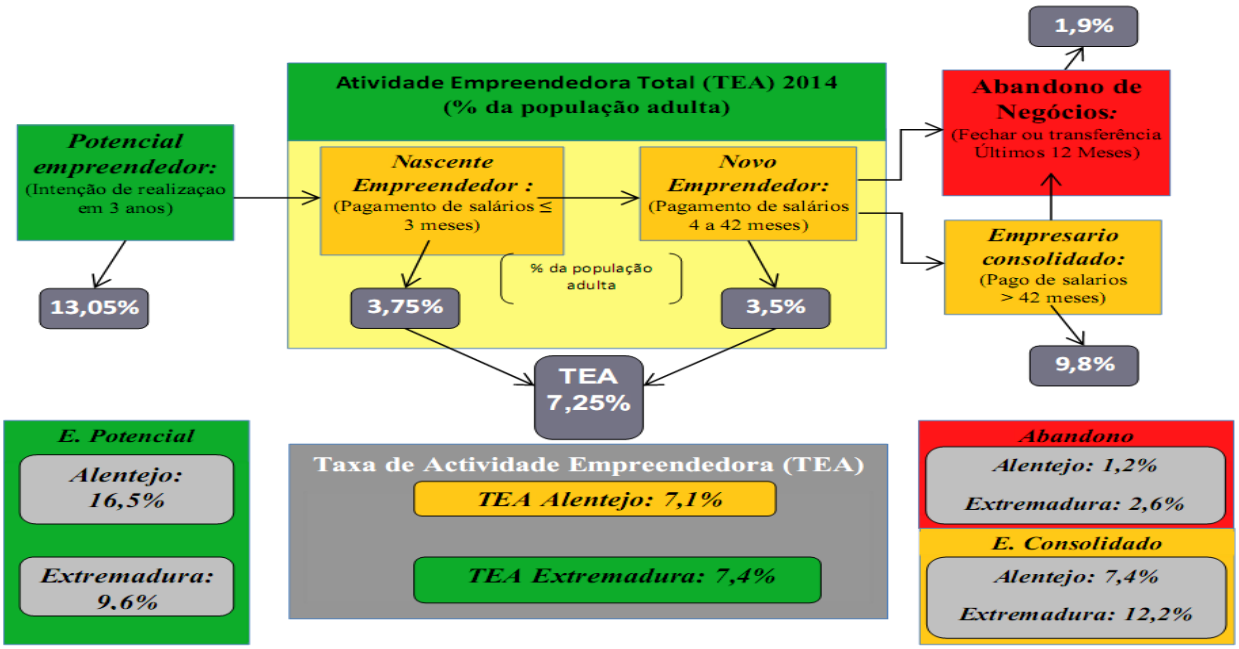
De acordo com o referido, o desenvolvimento de um País ou de uma região passa pela capacidade de se produzir riqueza capaz de gerar bem-estar e qualidade de vida às suas populações. A envolvência territorial e as questões da proximidade tornam-se visíveis e pertinentes para análise da performance empresarial, uma vez que as empresas são obrigadas a agir em função dessas diferenças. A existência de alguma permeabilidade nessas regiões, permite às populações explorar as diferenças entre os dois lados da fronteira, comparando os desiguais níveis de preços que sempre estimularam o comércio transfronteiriço entre Portugal e Espanha (Gaspar, 1996). Nas regiões de fronteira o empreendedor enfrenta uma serie de desafios e é limitado em muitos fatores, incluindo a procura local limitada, a pequena dimensão do mercado, a falta de acesso a mercados extraregionais, a baixa densidade populacional e a consequente falta de oportunidade para a rede de interação com os atores regionais, o uso generalizado das tecnologias de informação e as dificuldades no acesso ao capital (Fuller-Love, Midmore, Thomas & Henley, 2006; Macías *et al*., 2014). Sendo regiões predominantemente rurais, com baixa densidade populacional e de empresas, em que se verifica desarticulação da estrutura produtiva tradicional (Natário *et al.,* 2018), o fomento do empreendedorismo, na linha dos processos territoriais de inovação (Lundvall,1992: Edquist, 1997), é fundamental para a sua sustentabilidade a curto, médio e a longo prazo (Macías *et al*., 2014).

A ausência de estudos aprofundados sobre este tema, associada á escassa informação sobre o modo e a forma como o desenvolvimento da sociedade e da economia portuguesas e espanhola, assentam em sinergias inter-regionais, ou seja, não há estudos sobre as trajetórias e dinâmicas do desenvolvimento das regiões que equacionem o modo e a extensão da influência do desenvolvimento de uma determinada região no desenvolvimento das outras regiões e, reciprocamente, como é influenciado por estas (Vale, 2009).

Os laços históricos entre Espanha e Portugal a nível cultural, social e, sobretudo, económico levam a que, também em termos de dinâmicas empreendedoras, os dois países devam ser analisados e avaliados conjuntamente.

O esbatimento das fronteiras económicas e sociais assenta na implementação de programas de desenvolvimento económico, baseados na valorização dos recursos endógenos, no reforço da competitividade das empresas, na internacionalização destas regiões, na inovação, na cultura e saberes locais, no reforço da rede de infraestruturas e equipamentos, no reforço e ordenamento da rede urbana, uniformização e aproximação da legislação laboral e de investimentos, no reforço da circulação de informação e no estimulo ao intercâmbio cultural, recreativo e desportivo (Reigado, 2009)

Importa aqui aferir também se o desenvolvimento destas regiões assenta em sinergias inter-regionais, tentando perceber as suas trajetórias, as dinâmicas de desenvolvimento, por forma a equacionar, o modo e a extensão, da influência do efeito fronteira no desenvolvimento das iniciativas empreendedoras nessas duas regiões. Este processo não só se constitui como um passo em frente em termos de integração económica dos dois países, como traz um considerável valor acrescentado ao GEM.



[Fonte: www.gemextremadura.es/Mis archivos/Informes/GEMEUROACE-2014-15.pdf]

Figura 5: O Processo Empresarial na Euroregião Alentejo/Extremadura

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Com base no Relatório sobre Empreendedorismo na EUROACE[2] 2014-15[3], podemos verificar que a região Alentejo apresentou uma taxa de iniciativas empreendedoras (TEA – ou seja o número de pessoas entre 18 e 64 que exercem uma atividade empresarial que ainda não completou três anos e meio) de 7,1% enquanto a Extremadura apresentou 7,4%. Sendo que os seus países apresentaram, respetivamente, 10 e 5,5, o que coloca a região da Extremadura francamente mais á frente no conjunto em analise.

Para além disso, as pessoas que durante o último ano abandonaram uma atividade empresarial representam 2,6% da população adulta na Extremadura e 1,2% no Alentejo.

Do total de iniciativas desenvolvidas, a Extremadura é a região que tem mais iniciativas baseadas na oportunidade e menos na necessidade (73,9% vs. 23,2%). Por seu lado, o Alentejo, face à Extremadura, centra menos iniciativas na oportunidade (69,2%) e mais na necessidade (30,8%).

De acordo com os especialistas, as condições para empreender nestas regiões não são favoráveis. Das 16 condições para empreender analisadas, somente 5 mantêm valores positivos e são elas: o interesse pela inovação; a motivação para empreender; o acesso à infraestrutura física; o apoio a negócios de alto crescimento; o apoio à mulher empreendedora.

Quanto aos fatores que criam entrave à atividade empreendedora são apontados:

- a falta de apoio financeiro;
- as normas culturais e sociais;
- as políticas governamentais.

Por outro lado, os fatores que mais favorecem a atividade empreendedora são:

- a educação e formação;
- a crise económica;
- os programas e políticas dos governos;
- as normas sociais e culturais.

Para o incremento da atividade empreendedora, os especialistas recomendam no futuro:

- políticas e programas governamentais que favoreçam o surgimento de novasempresas;
- mais apoio financeiro para a criação de empresas;
- a educação e formação empreendedora a todos os níveis;
- e a transferência de pesquisa e desenvolvimento.

No Relatório foram apresentados como fatores determinantes para a atividade empreendedora transfronteiriça e que geram dificuldades:

- as normas culturais e sociais;
- as políticas governamentais;
- acesso a infraestruturas físicas.

IV. Conclusões

Neste trabalho, tentamos entender a relação entre a fronteira e as iniciativas empreendedoras, como fator de desenvolvimento do território, estudamos, a fronteira e a atividade empreendedora, verificando que as condições que influem na actividade empreendedora são em muito reflexo da existência de uma fronteira cujos mecanismos nacionais e supranacionais não conseguem inverter.

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[2] A Eurorregião EUROACE, fundada em 2009, composta pela região espanhola da Extremadura e pelas regiões portuguesas do Alentejo e Centro, resulta de um protocolo assinado entre as três regiões para a elaboração de novas estratégias de cooperação, assumindo extrema importância para o desenvolvimento económico das relações entre Portugal e Espanha devido à sua posição privilegiada relativamente à diagonal continental e faixa atlântica. O território, na sua totalidade, equivale a quase um quinto da superfície espanhola, contendo mais de 3 milhões de habitantes

[3] O Relatório sobre Empreendedorismo na região EUROACE constitui-se como o primeiro resultado prático da implementação transfronteiriça do GEM, avaliando os níveis e natureza da atividade empreendedora na Eurorregião, fazendo uso da experiência prévia das equipas nacionais e regionais do GEM em Espanha e Portugal.

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6. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. Revise what you wrote: When you write anything, always read it, summarize it, and then finalize it.

8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. Use proper verb tense: Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.
Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

19. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

20. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

21. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

22. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

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Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.



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Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.



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Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

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Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

INDEX

A

Absurd · 4
Alleviate · 1, 9
Assimilated · 2
Astonishing · 2

C

Chaotic · 15
Conjunction · 1
Convergence · 21

D

Decadent · 21
Diminish · 3, 8
Disheartened · 3
Disincentivize · 7, 12
Dispossession · 17
Dissipation · 23
Dissonance · 20
Dwindling · 15

E

Erroneous · 1
Exquisite · 19

F

Flatulent · 17
Flawed · 15
Fragmented · 6, 8

G

Glazed · 30
Glorified · 19

I

Impoverished · 21, 22
Inclusivity · 3
Incumbent · 6
Interlocutors · 7

L

Leverage · 9

P

Pervaded · 22
Preemptive · 2
Preparatory · 2

R

Replicates · 2, 9
Revealing · 16, 19, 3

S

Scriptures · 23
Scrutinizes · 1
Sprung · 3
Squatting · 20
Stealing · 2

V

Vacuous · 17
Vigorously · 2



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