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# DATA-DRIVEN CURRICULUM DEVELOPMENT: USING PUBLICLY AVAILABLE DATA TO IDENTIFY THE WORKFORCE NEEDS FOR UNDERGRADUATE BUSINESS STUDENTS

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## ABSTRACT

*Assuring the alignment of business education with labor market needs is crucial for preparing graduates with the necessary skills for their future careers. Combining data from the U. S. Census Bureau's American Community Survey and the U. S. Department of Labor's Occupational Information Network, this paper examines the occupational outcomes and required skills of jobs most commonly held by undergraduate business majors. Significant diversity in occupational outcomes for undergraduate business graduates exists, which suggests a need for a curriculum providing a broad range of skills. Additionally, by utilizing data from occupational analysts on the skills required in jobs and supplementing these data with information about in-demand technology skills from real-world job postings, stakeholders in colleges of business can ensure their curriculum is aligned with the current needs of the labor market.*

**Keywords:** *business curriculum, skill requirements, O*NET, occupational outcomes*

## INTRODUCTION

According to several polls, students' primary motivation for attending institutions of higher education in the United States is to improve their job prospects (Higher Education Research Institute, 2012; Strada Education Network & Gallup, 2018). Several states have developed explicit goals with regard to the skills of graduates of state institutions of higher education. (Colorado Department of Higher Education, 2021; Texas Higher Education Coordinating Board, 2015). For example, one goal of the Texas Higher Education Coordinating Board's current strategic plan is "by 2030, all graduates from Texas public institutions of higher education will have completed programs with identified marketable skills" (Texas Higher Education Coordinating Board, 2015, p. 22). This plan requires state institutions to define and assess marketable skills for each of their program offerings.

Additionally, some accrediting bodies emphasize the importance of aligning curriculum with labor market needs. The Association to Advance Collegiate Schools of Business (AACSB) standards require that accredited business schools align their curriculum with the relevant skills in the workforce, including the use of appropriate technologies used in the business environment (AACSB International, 2020). Students, policy makers, and business accrediting bodies demand curriculum that is current, relevant, and aligned with workforce needs. This alignment is complicated by an ever-changing job market, as well as advances in technology that fundamentally change job tasks and the required skills of workers. However, there are several

methods by which institutions can ensure that their offerings meet the needs of employers, prospective students, accrediting bodies, and state legislatures. This paper provides a method for stakeholders of colleges of business to use publicly available data to help ensure their curriculum prepares graduates with the in-demand skills required in the current and future labor market.

## LITERATURE REVIEW

Education in business has evolved substantially in the United States over the past several centuries. At first, training in commerce was conducted using an apprenticeship system; later private business schools offered coursework in vocational skills useful in business (Applegate, 2022). Even later, traditional colleges and universities began to offer a business education, in a move that attempted to shift the focus away from purely vocational training towards a more comprehensive college education (Khurana, 2010). Founded in 1881, the Wharton School claims to be the world's first collegiate business school, with a foundational goal of preparing graduates with the knowledge to become "pillars of the State, whether in private or in public life" (University of Pennsylvania, n.d.).

Curriculum in colleges of business has changed over time, as the labor market itself has transformed. Much has been written by economists about the many ways new technologies have impacted the labor market (Acemoglu & Autor, 2011; Damelang & Otto, 2024; Hötte et al., 2023). One theme from this literature is the idea that new technologies replace human labor for certain tasks, while increasing the productivity of workers in other functions, therefore increasing the demand for these activities (Acemoglu & Restrepo, 2019; Autor, 2015). For example, the accounting profession has undergone substantial changes since the widespread adoption of the personal computer, and future technologies including artificial intelligence are forecasted to further change the nature of accounting jobs. (Cunha et al., 2022; Moll & Yigitbasioglu, 2019; Kee, 1993). Of course, accounting jobs have not been eliminated due to the adoption of new technologies including the widespread adoption of personal computers and spreadsheet software. Rather, the nature of the tasks of a typical accountant have changed and will continue to change in the future, due to new and unforeseen innovations. If colleges of business want to continue to provide current and relevant training, the curriculum will need to adapt to an ever-changing world.

For decades, some researchers have been critical of the relevance of business school training (Leavitt, 1989; Pfeffer & Fong, 2002). When implementing a curriculum that provides an occupationally relevant education, one obviously would need to identify the related target occupations of graduates. Research suggests that student major selection is often related to student occupational goals, even though many programs are not explicitly aligned with one specific job (Patnaik et al., 2020). Although some undergraduate majors like nursing or elementary education tend to lead to employment in a specific occupation, most college program offerings lead to at least some occupational diversity (Ransom & Phipps, 2017). This diversity can add complexity to curriculum development, in that undergraduate program offerings do not typically align with exactly one job. While engineering, nursing, and education majors tend to have high occupational distinctiveness, business majors typically display more variety in occupational outcomes, with the exception of accounting programs. (Ransom & Phipps, 2017).

Institutions of higher education can individually track their graduates and collect occupational information in order to understand the types of jobs their graduates hold. Often this approach can suffer from problems of selection bias, as not all students will respond to alumni

surveys, or maintain LinkedIn or other social media profiles that can be tracked. As an alternative, the Bureau of Labor Statistics (BLS) and the National Center for Educational Statistics (NCES) jointly created a crosswalk between Standard Occupational Classification (SOC) and Classification of Instructional Programs (CIP), in order to link college program offerings to related occupations. This crosswalk is most useful for educational program and workforce alignment where degrees and occupations are closely aligned with one another (Goldman et al., 2015).

For most occupations there is typically more than one related program listed. For example, for the SOC for human resource managers, six separate CIP programs are listed as related to that one occupation. Most CIP programs also list multiple occupations in the crosswalk, as graduates of programs feed into multiple jobs. Although this linkage from jobs to degrees can be useful, it also does not provide any indication of the proportion of graduates that are hired into each occupation.

An alternative is to consider the business curriculum as a whole, rather than these more disaggregated CIP codes. David et al. (2011) conducted a content analysis of corporate job descriptions, student résumés, business course syllabi, and textbooks to examine the alignment of curriculum with entry-level jobs for undergraduate business majors. Using a sample of 200 entry-level job postings, 100 syllabi, and a sample of student résumés from five universities, the authors argue that there is a substantial gap between what is taught in colleges of business and the skills sought by companies. Specifically, they argue business colleges should revise their missions to become more practitioner-oriented, and shift the curriculum away from a focus on theory and more towards practice. The authors do note that their study may not be representative of colleges of business overall, as the data only came from five universities. (David et al., 2011).

Other evidence suggests the continued value of broad higher-order thinking skills in the labor market, and that schools are correct in focusing on these types of skills. A survey developed by the American Association of Colleges and Universities and administered to a sample of 1010 employers in May 2023 found that eight in ten employers either weakly or strongly agreed that higher education institutions were preparing graduates to success in the workforce (Finley, 2023). The survey did identify several gaps in employers' perceptions of certain skills, with weaknesses identified in oral and written communication, critical thinking, and adaptability and flexibility of recent graduates (Finley, 2023). Other surveys corroborate the value to employers of broad skills such as problem-solving, communication, and flexibility (National Associate of Colleges and Employers, n.d.).

## APPROACH AND DATA

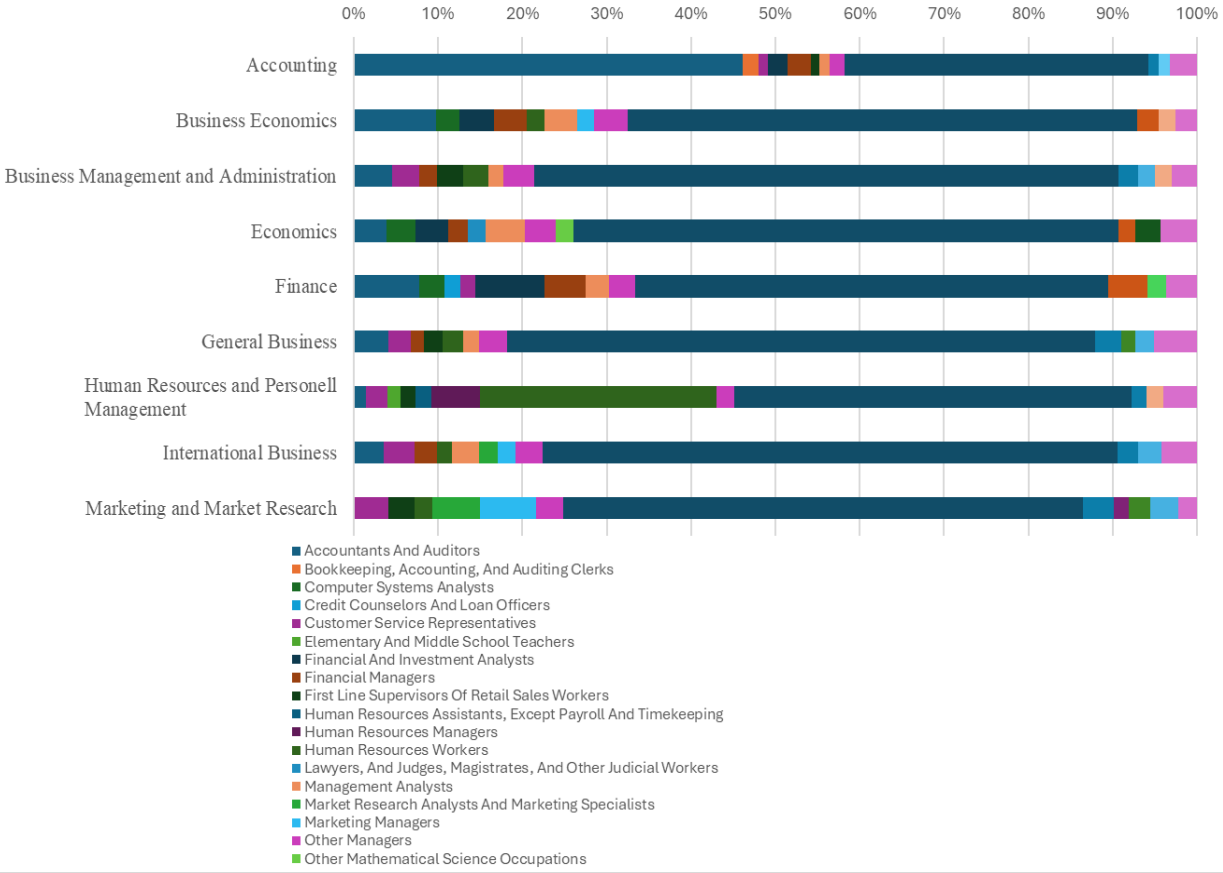
### American Community Survey

Rather than using data on graduates' employment history for a particular institution of higher education or the federal government's SOC to CIP crosswalk of programs to jobs, one can combine several sources of publicly available data to help understand the labor market needs associated with particular undergraduate business majors. These data can be used either as a stand-alone measure of the skills required for particular degrees, or to supplement other sources in curricular development and assessment. This process involves first linking undergraduate business programs to jobs, and then collecting information about the skills required within these particular occupations. First, data were extracted from the U. S. Census Bureau's American

Community Survey (ACS). The survey asks a variety of social, demographic, educational, and economic questions of members of approximately 3. 5 million households annually (United States Census Bureau, 2023). Since 2009, the ACS has inquired about field of study for those respondents who report having earned a bachelor's degree or higher. This question allows for the linkage of college major to employment information. Specifically, one can link college majors of survey respondents to specific Census Bureau occupations that are also collected in the ACS.

**Figure 1**

*Most Commonly Held Jobs for Select Undergraduate Business Programs (5-year ACS, respondents 30 Years or Younger)*




In order to isolate occupations of recent graduates, data from the most recent five-year ACS public use microdata sample was used, with information extracted on occupation and field of degree for individuals who report being 30 years old or younger. This age restriction exists so that the sample is restricted to relatively recent graduates, as the educational requirements of occupations has been noted to have changed over time (Goldman et al., 2015). In other words, a worker decades ago may have not needed a bachelor's degree to gain entry to certain occupations, whereas there is now an expectation that new employees hold a four-year degree. It is also possible that certain majors once provided entry to a particular occupation, but recent graduates are expected to have degrees in other specific degree programs. It should be noted that the ACS asks about the first bachelor's degree, so the occupational data are only linked to the

first degree earned, and workers may have more than one undergraduate degree and may also hold advanced degrees.

Figure 1 provides a visualization of the ten most common occupations held by graduates of nine of the most commonly offered business degrees, using the most recently available 5-year ACS data. Not all business majors are listed in this figure, and the Census Bureau does collect information for additional degrees in programs such as agribusiness, actuarial science, logistics, management information systems, and heath care management if stakeholders want to understand the labor market needs associated with occupations related to these additional majors. Both economics and business economics are included in Figure 1 as some colleges make distinctions between these degrees and may offer one or both of the programs. As an additional aside, the Census Bureau uses its own occupational code system, but provides a crosswalk to SOC codes, so that jobs can be linked to other commonly used data sources. Several patterns emerge from the data in Figure 1. First, as expected a few programs more carefully align with one or two specific jobs, whereas other programs have substantially more occupational diversity. For example, more than 46 percent of respondents with a first bachelor's degree in accounting report working as an accountant or auditor in the ACS. Likewise, almost 36 percent of survey respondents with human resource and personnel management degrees report being employed as either human resource managers, workers, or assistants. Even among graduates of these two business majors, there is substantial occupational diversity; a majority of graduates in these programs do not report working as accounting or human resource professionals, respectively. Other business majors listed demonstrate even more occupational diversity. Almost 70 percent of general business majors work in occupations other than the ten most commonly listed. These data reenforce the idea that business schools may wish to provide programs with a curriculum that focuses on skills outside of the most obviously linked occupation for each major.

**Occupation Skills Data**

Using occupational code crosswalks, occupational data from the ACS can be linked to other data sources that provide information about the skills required in various jobs. The U. S. Department of Labor's Office of Policy and Research developed the Occupational Information Network (O*NET) in the late 1990s in order to replace the previously used Dictionary of Occupational Titles. (Rounds et al., 1999). O*NET provides a variety of information about occupations, including the required knowledge, skills education, experience, training, and tasks required for each job. The database was developed to help support individuals in making career and educational decisions as well as to aid policymakers and researchers in their study of labor markets. O*NET data is mostly available for jobs that have associated SOC codes from the BLS, although there are some exceptions as noted later in this paper. O*NET also provides a comprehensive list of real-world job titles, which can be particularly useful in linking the government occupational codes to real-world job advertisements. Crucially, O*NET is continually updated to provide information about the skills, educational requirements, and tasks that typically exist for each occupation.

Among other items, O*NET contains occupation-specific information about required jobs skills, including broad skills that are deemed essential to a variety of jobs. At their most general, the O*NET skills are categorized into seven broad groups of skills: content, process, social, complex problem-solving, technical system, and resource management skills (Fleisher & Tsacoumis, 2012). These skills are further disaggregated into 35 separate job skills within the

aforementioned seven broad categories. For example, social skills include the sub-skills of social perceptiveness, coordination, persuasion, negotiation, instructing, and service orientation (Fleisher & Tsacoumis, 2012). Eight occupational analysts rate both the importance and level of each of the 35 skills for each O*NET occupation (Burgoyne et al., 2021). Importance measures how critical the skill is for successfully performing a particular job, while level refers to the degree of proficiency a worker needs in that skill or that particular occupation. As an example, 'speaking' is defined in O*NET as talking to others to convey information effectively, and is a sub-skill of the broad 'content' skill category. (United States Department of Labor Employment and Training Administration, n.d.) Speaking is rated as an important skill for both lawyers and paralegals, but occupational analysts rate the level of speaking required as higher for lawyers as compared to paralegals. Although both jobs require the ability to verbally convey information effectively to judges, clients, and juries, occupational analysts only rate the level of speaking skill required as average for paralegals, while they assess that lawyer must be able to speak effectively at a very high level. To complicate matters, importance is rated by analysts on a scale of 1-5, while level is assessed using a 0-7 scale. O*NET documentation provides a method for converting these separate ratings into a standardized score on a 100-point scale, in order to make the ratings more comprehensible to users (United States Department of Labor Employment and Training Administration, n.d.). As an example, analysts rate the importance of mathematics skills at 100 for mathematicians on this standardized scale, while they rate mathematical skill as 0 in importance for actors.

In recent updates, O*NET also provides a list of in-demand technology skills, which are software or technology requirements that are frequently included in employer job postings online (Lewis & Morris, 2022). The Department of Labor partnered with Burning Glass Technologies, now called Lightcast, in order to collect information web-scraped from online job postings. Although Lightcast is a proprietary data source, annual information about these in-demand skills is made publicly available in the O*NET database, along with other related information for each occupation. In-demand technology skills are defined as technology and software identified by O*NET that appear in more than five percent of all unique, unduplicated online job postings for that occupation during a calendar year. In this case, the most recent data from 2023 are utilized. Occupations with fewer than 50 unique occupations are omitted from inclusion in these data (Lewis & Morris, 2022).

**Table 1**
*Most Common Occupations for Graduates of Business Programs (Respondents 30 Years or Younger from 5-year ACS)*

| ACS Occupation Title | Frequency Listed in Programs | Exact Match (O*NET) | Sample of Reported Job Titles |
|---|---|---|---|
| Other Managers | 9 | no | This category represents jobs with characteristics which do not fit into one of the O*NET-SOC occupations |
| Accountants And Auditors | 8 | yes | Accountant, Auditor, Certified Public Accountant, Cost Accountant, Financial Auditor, Internal Auditor |
| Financial Managers | 7 | yes | Accounting Supervisor, Branch Manager, Business Banking Manager, Credit Manager, Financial Planning Manager |
| Management Analysts | 7 | yes | Business Analyst, Business Consultant, Management Analyst, Management Consultant |
| Customer Service Representatives | 7 | yes | Account Representative, Client Services Representative, Customer Care Representative, Customer Service Agent, |
| Human Resources Workers | 6 | yes | Corporate Recruiter, Employment Representative, HR Analyst, HR Coordinator HR Generalist |
| Retail Salespersons | 6 | yes | Customer Assistant, Retail Salesperson, Sales Associate, Sales Consultant, Sales Representative |
| First Line Supervisors of Retail Sales Workers | 5 | yes | Department Manager, Department Supervisor, Shift Manager, Store Manager |
| Financial And Investment Analysts | 4 | no | Analyst, Credit Products Officer, Financial Analyst, Investment Analyst, Portfolio Manager, Securities Analyst, Trust Officer |
| Sales Representatives, Wholesale and Manufacturing | 4 | no | Inside Sales Representative, Marketing Representative, Sales Representative |
| Marketing Managers | 3 | yes | Account Supervisor, Brand Manager Marketing Coordinator, Marketing Director, Marketing Manager, Product Manager |
| Personal Financial Advisors | 3 | yes | Certified Financial Planner (CFP), Financial Advisor, Financial Counselor, Financial Planner, Portfolio Manager, Wealth Advisor |
| Computer Systems Analysts | 3 | yes | Applications Analyst, Business Systems Analyst, Computer Systems Analyst, Computer Systems Consultant |
| Secretaries And Administrative Assistants, Except Legal, Medical, And Executive | 3 | yes | Administrative Assistant, Administrative Specialist, Office Assistant, Secretary, Staff Assistant |
| Market Research Analysts and Marketing Specialists | 2 | yes | Business Development Specialist, Communications Specialist, Market Analyst, Market Research Analyst, Market Research Consultant, Market Research Specialist, Market Researcher |
| Sales Managers | 2 | yes | District Sales Manager, Regional Sales Manager, Sales and Marketing Vice President (Sales Director, Sales Manager, |

# RESULTS

## Broad Occupational Skills

Table 1 provides more detail about the specific occupations held by graduates of business programs. Specifically, the table shows the frequency with which occupations are listed in the top ten occupations of each of the nine selected business programs, for workers 30 years of age or younger. Only the Census Bureau occupation 'other managers' makes the top ten occupations for each of the nine selected majors, although there is substantial overlap across various business programs. 'Accountants or auditors' ranks among the top ten most commonly reported occupations held by younger workers in eight of the nine programs, for example. Table 1 also includes a sample of reported job titles from O*NET, which can help provide some real-world context for the specific occupational categories. Not all ACS occupations align perfectly with the O*NET data. 'Other managers' include a wide range of jobs that have little in common in terms of skills and tasks, while 'financial and investment analysts' and 'sales representatives, wholesale and manufacturing' include multiple occupations in O*NET and cannot be linked directly to a specific O*NET occupational skillset. Therefore, these three ACS occupations will be excluded from further analysis. In order to understand the required skills of business graduates as a whole rather than a particular major, any occupation only in the top ten most common jobs for exactly one major are also excluded. Therefore, there are 13 occupations remaining that were chosen to be linked to O*NET skills. These 13 occupations are denoted with a 'yes' in the third column of Table 1 and will be the target group of jobs for the analysis of broad skills for business majors.

Table 2 provides a summary of the skills in O*NET associated with these 13 occupations, as assessed by occupational analysts in the Department of Labor. The ratings for importance of and level are standardized to a 100-point scale, and the skills are sorted by the number of the common occupations rated as requiring at least average importance of the particular skill. Table 2 only includes 27 of the 35 broad skills, as eight of the skills are not rated as of at least average importance in any of the 13 target occupations. These include skills such as equipment maintenance, repairing, and management of material resources, among others that are typically not required of occupations held by typical business graduates. Eight skills are assessed as at least of average importance in all 13 occupations: active listening, critical thinking, monitoring, reading comprehension, social perceptiveness, speaking, time management, and writing. The O*NET data provides evidence that these broad skills are the most important for jobs that are typically held by younger business graduates.

Many of the skills listed in Table 2 are similar to common learning goals of undergraduate business programs. While accrediting bodies are often loathe to specify exactly what skills higher education institutions should target, there is some commonality across institutions in selecting learning goals, and several of those common goals align with the skills listed in Table 2. Woodside (2020) conducted a meta-analysis of undergraduate learning goals across AACSB accredited business schools and found substantial commonality across institutions. Woodside found written communication, oral communication, application of knowledge, and ethical understanding and reasoning to be the most common learning goals.

Teamwork, global knowledge, critical thinking, analytical thinking, evidence-based decision making, and the ability to solve problems were also common learning goals listed in the meta-analysis (Woodside, 2020). Of the eight broad skills identified in all of the related occupations, several seem to be aligned with common learning goals of business schools. Speaking and writing skills are directly linked to oral and written communication. Social perceptiveness is defined as being aware of others' reactions and understanding why they react as they do, which may be part of working effectively in teams, for example. (Fleisher & Tsacoumis, 2012).

Active listening, monitoring, and time management do not commonly appear as learning goals among AASCB accredited institutions, and potential could be areas where programs could find opportunities to strengthen the skills of the graduates. Of course, it is also possible that programs may already provide training in these skill areas even if they are not explicit goals incorporated into formal assessment documentation. Negotiation and persuasion are also rated as above average in importance in 10 of the 13 target occupations. In terms of the level of the skill required, only active listening was rated as above average in each of the 13 occupations. Stakeholders can find definitions of each of these broad skills in O*NET documentation (Fleisher & Tsacoumis, 2012).

**Table 2**
*Importance and Level of Skills Required for Most Common Occupations of Business Majors (Respondents 30 Years or Younger from 5-year ACS)*

| | Importance | | | | Level | | | |
|---|---|---|---|---|---|---|---|---|
| | **Sum** | **Mean** | **Max** | **Min** | **Sum** | **Mean** | **Max** | **Min** |
| Active Listening | 13 | 73 | 78 | 69 | 13 | 57 | 63 | 52 |
| Critical Thinking | 13 | 68 | 78 | 50 | 12 | 56 | 61 | 45 |
| Monitoring | 13 | 59 | 72 | 50 | 10 | 54 | 68 | 43 |
| Reading Comprehension | 13 | 69 | 78 | 50 | 11 | 57 | 66 | 45 |
| Social Perceptiveness | 13 | 61 | 72 | 50 | 7 | 50 | 59 | 43 |
| Speaking | 13 | 73 | 78 | 69 | 12 | 56 | 59 | 45 |
| Time Management | 13 | 56 | 66 | 50 | 4 | 47 | 55 | 41 |
| Writing | 13 | 64 | 75 | 50 | 11 | 53 | 59 | 43 |
| Coordination | 12 | 57 | 72 | 47 | 6 | 48 | 59 | 41 |
| Service Orientation | 12 | 61 | 75 | 47 | 6 | 49 | 55 | 41 |
| Active Learning | 11 | 58 | 72 | 47 | 7 | 51 | 59 | 41 |
| Complex Problem Solving | 11 | 60 | 75 | 44 | 9 | 50 | 57 | 36 |
| Judgment and Decision Making | 11 | 61 | 75 | 47 | 9 | 51 | 59 | 37 |
| Negotiation | 10 | 52 | 72 | 35 | 5 | 46 | 55 | 30 |
| Persuasion | 10 | 57 | 78 | 31 | 7 | 50 | 63 | 30 |
| Systems Analysis | 9 | 50 | 69 | 25 | 7 | 45 | 57 | 27 |
| Learning Strategies | 8 | 47 | 56 | 28 | 4 | 44 | 54 | 27 |
| Systems Evaluation | 8 | 49 | 72 | 25 | 5 | 45 | 59 | 25 |
| Mathematics | 7 | 47 | 67 | 25 | 3 | 43 | 57 | 23 |
| Instructing | 6 | 49 | 66 | 28 | 5 | 46 | 52 | 34 |
| Management of Personnel Resources | 5 | 48 | 69 | 31 | 4 | 43 | 57 | 30 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Management of Financial Resources | 3 | 33 | 53 | 10 | 3 | 32 | 54 | 7 |
| Operations Analysis | 3 | 34 | 60 | 6 | 3 | 31 | 55 | 4 |
| Operations Monitoring | 1 | 23 | 50 | 13 | 0 | 20 | 45 | 7 |
| Programming | 1 | 21 | 56 | 6 | 1 | 18 | 57 | 4 |
| Quality Control Analysis | 1 | 22 | 50 | 3 | 1 | 19 | 50 | 2 |
| Troubleshooting | 1 | 7 | 53 | 0 | 1 | 7 | 55 | 0 |

**Table 3**
*In-demand Technology Skills for Most Common Occupations of Business Majors (O*NET and Lightcast Data)*

| | **Technology** | **Example Technology** |
|---|---|---|
| Accountants and Auditors | Spreadsheet software | Microsoft Excel |
| | Office suite software | Microsoft Office software |
| | Electronic mail software | Microsoft Outlook |
| | Presentation software | Microsoft PowerPoint |
| Computer Systems Analysts | Content workflow software | Atlassian JIRA |
| | Web platform development software | JavaScript |
| | Spreadsheet software | Microsoft Excel |
| | Office suite software | Microsoft Office software |
| | Presentation software | Microsoft PowerPoint |
| | Object-oriented development software | Oracle Java and Python |
| | Enterprise resource planning ERP software | SAP software |
| | Data base user interface and query software | Structured query language SQL |
| Customer Service Representatives | Spreadsheet software | Microsoft Excel |
| | Office suite software | Microsoft Office software |
| | Electronic mail software | Microsoft Outlook |
| Financial Managers | Spreadsheet software | Microsoft Excel |
| | Office suite software | Microsoft Office software |
| | Electronic mail software | Microsoft Outlook |
| | Presentation software | Microsoft PowerPoint |
| First-Line Supervisors of Retail Sales Workers | Office suite software | Microsoft Office software |
| Human Resources Managers | Spreadsheet software | Microsoft Excel |
| | Office suite software | Microsoft Office software |
| | Electronic mail software | Microsoft Outlook |
| | Presentation software | Microsoft PowerPoint |
| Management Analysts | Spreadsheet software | Microsoft Excel |
| | Office suite software | Microsoft Office software |
| | Presentation software | Microsoft PowerPoint |
| | Process mapping and design software | Microsoft Visio |
| | Database user interface and query software | Structured query language SQL |
| Market Research Analysts and Marketing Specialists | Graphics or photo imaging software | Adobe Photoshop |
| | Data mining software | Google Analytics |
| | Spreadsheet software | Microsoft Excel |
| | Office suite software | Microsoft Office software |
| | Electronic mail software | Microsoft Outlook |
| | Presentation software | Microsoft PowerPoint |
| | Customer relationship management software | Salesforce software |
| | Video creation and editing software | TikTok |
| Marketing Managers | Spreadsheet software | Microsoft Excel |
| | Office suite software | Microsoft Office software |

| | | |
|---|---|---|
| | Presentation software<br>Customer relationship management software | Microsoft PowerPoint<br>Salesforce software |
| Personal Financial Advisors | Spreadsheet software<br>Office suite software<br>Presentation software | Microsoft Excel<br>Microsoft Office software<br>Microsoft PowerPoint |
| Sales Managers | Spreadsheet software<br>Office suite software<br>Electronic mail software<br>Presentation software<br>Customer relationship management software | Microsoft Excel<br>Microsoft Office software<br>Microsoft Outlook<br>Microsoft PowerPoint<br>Salesforce software |
| Secretaries and Administrative Assistants, Except Legal, Medical, and Executive | Spreadsheet software<br>Office suite software<br>Electronic mail software<br>Presentation software<br>Word processing software | Microsoft Excel<br>Microsoft Office software<br>Microsoft Outlook<br>Microsoft PowerPoint<br>Microsoft Word |

## In-demand Technology and Software

As with broad skills, the focus of analysis will be on the most commonly held jobs of younger business graduates. As previously mentioned, data on in-demand technologies are drawn from real-world job postings from Lightcast for the 2023 calendar year. Of the 13 previously described commonly held occupations, all have at least one identified in-demand technology or software skill, except for retail salespersons. Although this occupation is commonly held by younger business graduates, the BLS notes that no formal educational credential is required to become a retail salesperson, and this may not be a job that business schools target for their graduates (Bureau of Labor Statistics, U. S. Department of Labor, 2023). Table 3 provides a summary of the in-demand technology and software for the remaining 12 target occupations. The skills are presented as reported by O*NET, although there is some overlap in some of the in-demand skills. For example, all 12 occupations list office suite software as in-demand, while some job postings also reference software itself typically included in an office suite software program such as e-mail, word processing, presentation software, and spreadsheets. In fact, spreadsheet software is listed separately in 11 of the occupations as in-demand, while presentation software is listed separately for 10 of the jobs. Although it may seem obvious that workers need to be able to use office suite software in their jobs, not all occupations have job postings referencing these technologies. Of the 923 separate occupations where data is collected by O*NET on in-demand technology, only 347 occupations list office suite software as an in-demand technology; that number is reduced to 316 and 163 for spreadsheet and presentation software, respectively. However, for the types of jobs that business graduates hold, these basic software skills seem to be in high demand.

Beyond basic office suite technologies, the list of occupations in Table 3 differ somewhat in terms of software skills that are currently rated as in-demand. Customer relationship management software was rated as in-demand for jobs in marketing and sales, whereas Structure Query Language (SQL) appeared in a substantial number of job postings for both management and computer systems analysts. Not surprisingly, computer systems analyst job advertisements also reference various programming languages such as Python, Java, and JavaScript.

## CONCLUSION

The analysis of data from ACS and O*NET provide several key stylized facts. First, business graduates exhibit significant occupational diversity, with graduates finding employment in roles that require a variety of general skills. Second, many of the identified broad skills are already targeted by the learning goals of AACSB institutions, which is a sign that accredited colleges of business are at least somewhat aligned with the workforce needs of relevant occupations for early career business graduates. However, some broad skills such as active listening, monitoring, coordination, and persuasion are not as commonly represented in typical learning goals. These may be areas where there are opportunities for curricular changes to better equip students with the skills needed to be successful in their future careers. It is also possible that students are already inculcated with these skills and that institutions simply need to find ways to demonstrate their students' mastery of skills. For example, institutions could consider skills badging or certificates associated with particular skills.

In terms of technology skills, the data from job advertisements from 2023 demonstrate that early career business occupations most common in-demand technology skill is the use of spreadsheets and presentation software. These skills show up across the occupational spectrum for common jobs of younger business graduates. For certain types of analyst occupations, other types of software skills are in-demand, including customer relationship management software, SQL, and programing languages for computer system analysts. Although the job advertisement data is collected from a proprietary data source, O*NET provides a publicly available way to observe these in-demand technology skills on an annual basis, by occupation. This information can be particularly useful in ensuring that curriculum is current and relevant, in a rapidly changing business environment.

In terms of future research, there are several avenues worthy of further exploration. First, this paper has exclusively focused on the occupations held and skills required for business majors. It would be useful to conduct a similar analysis of the occupations held by graduates of traditional liberal arts programs, especially in a time of declining enrollment in these programs. A better understanding of the jobs most commonly held by recent graduates of non-business programs and the required skills associated with these jobs would make it possible to add explicit vocational elements to these degrees. As previously mentioned, this will be particularly important given the primary motivation students report for attending institutions of higher education. Second, the recent emergence of new technologies related to artificial intelligence promises to change the workplace in the next few decades. Will firms demand that all college graduates be fluent in the use of these new machine learning technologies, or will these tools be isolated to a handful of programs and related occupations? Artificial intelligence skills do not appear in the most recent data as described in this paper, but stakeholders will want to track the use of these technologies in order to maintain the currency and relevance of their programs. Finally, the focus of this paper was on the skills associated with occupations of relatively recent graduates. One could also conduct a similar analysis for older graduates of business programs, to understand the skill requirements for mid-career workers. This analysis would be particularly useful for institutions offering masters or graduate certificates, to ensure that their offerings are relevant to the labor market needs for their graduates.

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# NEW FRONTIERS IN SERVICES: A TASK-ORIENTED CLASSIFICATION OF SERVICE ROBOTS

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## ABSTRACT

*During the past few years, the service industry has been hit by a wave of automation, technology, and artificial intelligence. Robots that traditionally were used in the manufacturing industry started to move into dynamic human environments, assisting humans in work and private lives (Chuah, Aw & Yee, 2021; Nelson, 2017). The need for innovation, labor shortages, and the isolation imposed after COVID-19 have driven the use of emerging technologies that lead to the visualization of service robots as support or substitute for humans in situations such as providing services. services (Bowen & Morosan 2018; Wirtz, Kunz & Paluch 2021). This market development brings a unique opportunity for entrepreneurs to enter untapped markets.*

*The service industry is relatively broad, and robots have been well received so far, especially for repetitive tasks such as checking guests in hotels, providing information at airports, serving in restaurants or hospitals, and even entertaining customers (Tuomi et al., 2021). The combination of technology and artificial intelligence has allowed service robots to go from performing repetitive tasks to performing simple and complex tasks based on three basic skills essential for dealing with customers. As technology development speeds up, entrepreneurs must comprehend customers' and employees' expectations and perceptions in various service encounters in order to develop well-accepted robots.*

*To better understand service robots and to provide a common language within the entire domain, this study summarizes and proposes a table with different types of robots, including their definitions, possible classification labels, and examples (Nassiraei & Ishii, 2007; Huang & Rust, 2021; Vujovic et al., 2017). It also proposes a classification model for task-oriented physical robots based on three skills, social/emotional, cognitive/analytical, and physical, for performing simple and complex tasks during service deliveries.*

**KEYWORDS:** *Service robots, artificial intelligence, customer satisfaction, task-oriented classification.*

## INTRODUCTION

Humanity has experienced the birth of various technological inventions that have changed lifestyles. They have gone from horse-drawn cars, steamboats, and railways to electric vehicles, motorboats, and subway lines, from telegraphs and physical letters to mobile devices and emails. The appearance of steam engines and the use of electrical energy transformed society and strongly impacted the economy, quadrupling the world's per capita income with the industrial revolution (Sorooshian & Panigrahi, 2020; Bloem et al., 2014). Industry played a vital

role in the economy of the time, producing highly mechanized and automated material products. The manufacturing sectors, together with agriculture and textiles, were the most impacted, as technology made possible mass production and the division of labor through the use of the conveyor belt and the assembly line (Sorooshian & Panigrahi, 2020; Duarte et al., 2018). The implementation of technology in production prompted companies worldwide to constantly upgrade and automate their production processes to stay competitive in their fields.

Consumers live in an era of dizzying changes where the constant appearance of new technologies such as big data, the internet of things, artificial Intelligence (AI), and 5G communication have forced us to continually reinvent the way we live, especially organizations due to its remarkable dynamism and competitive field of business (Sheng et al., 2021). Technologies are getting smarter and more powerful, offering the possibility of quick machine setup and more efficient production processes. The use of lighter materials also makes them cheaper and driven by AI; they have become more desirable and adaptable to customer requirements, improving customer experience and quality of service in the service industry (Paluch & Wirtz, 2020). Some organizations have already started innovating AI alongside physical robots to take their service to another level, like Amazon's Prime Air, which uses drones to automate shipping and delivery. Domino's Pizza is experimenting with self-driving cars and delivery robots, and RedBalloon is using Albert's AI marketing platform to discover and reach new customers (Huang & Rust, 2021).

Factors like COVID-19 are accelerating innovation and change in the service field, encouraging the use of virtual reality and remote work in education. Even in health services, for instance, the demand for medical service robots that check people's temperature or take over disinfection work has increased during the last months, all due to the social distancing and nonphysical contact that has been imposed (Wirtz et al., 2021). The pandemic led to the visualization of service robots as supports or substitutes for humans in service encounters. The combination of technology and human capabilities can effectively improve service encounters, especially when used to perform tasks relatively simple and repetitively related to customer-facing. These repetitive tasks include "taking orders, dealing with payments, providing more product information, managing restaurant queues, and performing hotel customer check-ins" (Tuomi et al., 2021, p. 237).

Robots have moved from the industrial sector into dynamic human environments, increasingly supporting humans both at work and in their private lives, becoming service robots. The global service robotics market is growing at an annual compounded growth rate of 22.6% and is projected to increase from USD 37 billion in 2020 to USD 102.5 billion by 2025 (Chuah et al., 2021). This growth is due to factors such as positive profitability, improved resource utilization, demand forecast accuracy, quality control, process management, and disposal of human errors (Ivanov et al., 2017). In particular, recent years have seen rapid development in service robots for the hospitality industry, robots that cook complex meals, and robots that serve customers in hotels or airports. Bowen and Morosan (2018) believe that the main reason for the increase of robots in most industries is the labor shortage, which has pushed the use of emerging technologies to fill the need.

Japan, a pioneer country in the implementation of service robots, was forced to include service robots in hotels due to the increase in the proportion of elderly people, the drop in the birth rate, strict immigration policies, the expected significant growth of the demand for services, and the decrease in costs since robotic labor being usually less expensive than human labor. Henn-na Hotel was the first hotel in Japan to employ robots in all its operations without human intervention, from check-in at the front desk to automated bag drop, since 2015 (Tussyadiah & Park, 2018). Hotel robotics implementations are often integrated with other AI technologies, such as facial recognition, automatic checkout, and self-driving cars, to improve the experience. The success of service robots depends on the satisfaction of users. Some characteristics of robots induce positive reactions in consumers, for example, their level of anthropomorphism or the complexity level of cognitive/analytical tasks they perform (Wirtz et al., 2021; Tussyadiah & Park, 2018). Previous studies (Jia et al., 2021; Chuah et al., 2021; Park & del Pobil, 2013) indicate that human appearance induces positive perceptions and attitudes in consumers, so humans may judge humanoid robots favorably in terms of appearance and similarity with sociability required to perform complex tasks (Belanche et al., 2020).

The fast-paced development of service robots and frequent failure incidents led us to the research problem. There is a need for an organized effort in research and development. Moreover, these efforts should reflect the human element's expectations, both customers and employees. A classification framework will enable developers, policymakers, and academicians who wish to investigate human-robot interactions.

The service industry is relatively vast, as are the different robots that can be used in this industry, such as in hotels, airports, restaurants, hospitals, and even deliveries (Wirtz et al., 2021). Classifying them to better understand their similarities, differences, and possible combinations is necessary based on service robots' abilities and the complexity of the tasks they can perform. The abilities of service robots involve their social/emotional, cognitive/analytical, and physical skills. Thus, classification is necessary to understand the phenomenon as it provides a common language within the entire domain of service encounters (Lambert 2015)**.** This research aims to propose a classification of robots in the service industry based on three main characteristics and abilities, as well as the level of task development. This classification may help academic researchers develop theories about human-robot interactions, practitioners identify design specifications, and policymakers conceptualize regulations. Our research objective is to review the theoretical and practitioner literature to explore the phenomenon as it is occurring and organize the knowledge around a framework.

## LITERATURE REVIEW

Technological transformation has been evidenced since the Industrial Revolution at the end of the 18th century. Humanity has experienced different scientific-technological innovations such as steam engines, electric power, production lines in the manufacturing industry, and transformations in the service industry with transitions from full personal service to self-service technology (Bloem et al., 2014; Anitsal et al., 2002). The economic benefits of technological innovations were evident. Since the beginning of the 19th century, the income per capita grew at

an average of 0.9 percent per year, eight times faster than the growth before the Industrial Revolution. The era of constant economic growth began when consumers got used to constantly growing in production, pushing technology to continually reinvent itself with either new products or reductions in the cost of making existing products around different industries (R. C. Allen, 2006; de Steiguer, 1995; A. Khan, 2008). The service industry, for example, was motivated to increase sales and reduce labor costs, which led it to implement self-service systems in the 1930s. At that time, technology-based self-service came to the service industry with options such as self-price checkers, self-service checkouts in grocery stores, and automated teller machines (ATMs) (Anitsal et al., 2002).

The service sector has positively impacted the Gross Domestic Product (GDP) and promoted employment in the economically active population. The growth of this industry and its dominance in developing economies during the last decades has generated curiosity for research purposes (Stoshikj et al., 2016; Iglesias, 2018). Academics in North America and Europe are taking a new approach to services, viewing them as part of science for their ability to invigorate the economy. In the US alone, 75% of workers work in the service sector. According to the US Bureau of Labor Statistics (BLS), the service sector encompasses many industries. In 2020, the top four employment sectors in the US were education and health services, professional and business services, leisure and hospitality, and retail. The service sector also includes finance, communications, wholesale, insurance, transportation, real estate, logistics, postal operations, etc. (Hidaka, 2006; Holusha, 1989; Günay & Kurtulmuş, 2021). The breadth of the services sector makes it a dynamic, competitive, and attractive field for technological innovation.

Events such as the COVID-19 pandemic have also forced innovation within this sector. During this pandemic, the world economy experienced the worst crisis since the Great Depression of 1930. According to the International Monetary Fund (IMF), in 2020 alone, GDP fell by 3.5% worldwide, primarily due to significant losses in income from the service sector businesses such as bars and restaurants, hotels, educational institutions, and airlines. An impact similar to that of the Spanish flu at the end of the 20$^{th}$ century is estimated to have caused a GDP decline of 6% after its onset. (Açikgöz and Günay, 2021; Kurtulmuş, 2021).Technology led the situation during the 2020 pandemic, particularly in health and education. In the field of health care, most of the activities supported by technology and AI were the provisions of health services remotely, the prediction, detection, and monitoring of diseases in real-time around the world, and the analysis and visualization of disease spread trends (Vargo et al., 2021; Dananjayan & Raj, 2020). While in the educational system, schools had to provide emergency remote teaching to students from all over the world through electronic learning management systems such as Blackboard Learn, Moodle, ATutor, Sakai…, or cloud communication platforms such as Zoom, Microsoft Teams, WebEx, etc. (Jia et al., 2021; Gladilina et al., 2020; A. M. Khan et al., 2021).

While technology is leading, AI is taking a prominent role in customer service, increasing significantly due to isolation and restrictions imposed during the pandemic. Free virtual assistants such as Hyro are examples where through AI, technology helps healthcare companies and their patients to assist them using a database compiled by the World Health Organization (WHO) and other trusted sources of information to answer questions from customers, helping to regulate the increasing flow of online users (Abuselidze & Mamaladze, 2021). AI, combined

with other technology, is revolutionizing companies worldwide in different sectors by providing competitive and innovative products and services while executing mechanical and analytical tasks. In the service sector, AI and technology can be used as self-automated algorithm processors that can perform complex tasks to support customers and employees. Examples are used to predict customer behavior and generate personalized recommendations based on past data, such as customer behavior or preferences (Paluch & Wirtz, 2020).

Automation and AI have also made customers "active participants" in service encounters and how they want to experience them through introducing technology-based self-service (TBSS) options and service robots. According to the American Banking Association, in 2013, 56% of customers preferred to use mobile bank apps or ATMs rather than traditional services. Anitsal, Moon, and Anitsal (2002) stated that within service encounters, three characters, namely customer, employee, and technology, interact with one another in different interactive service options, evidenced from the beginning of the service transformation. For service marketing professionals, it's essential to understand the interactions that occur from various perspectives. The customer has always been part of these interactions. For example, customer-employee interaction denotes a complete service, which is known as a traditional encounter that requires low cognitive and emotional complexity. With the injection of technology in recent years, technology has become a new participant in these interactions. It has been observed from customer-technology, which is called self-service technology, to technology-employee interaction, which is known as service robots to serve employees and customers in tasks that require developing highly cognitive and analytical skills (Anitsal et al., 2002; Scherer et al., 2015; Wang et al., 2013).

Traditional services served as a development niche for service robots since the activities carried out there require low cognitive and low emotional complexity, such as carrying objects and undertaking monotonous assembly jobs. Technology and AI development have bet for top-of-the-line robots within the service industry to improve the service experience and reduce operating costs, goals the marketing field has been fighting for years to increase customers' standard of living. Now, it is sought that service robots also serve in services that require developing highly cognitive, analytical, and physical tasks within service encounters, such as assisting in medical surgery through voice-activated robotic arms or humanoid robots in hotel lobbies that welcome guests, carry the luggage to the guest room and even entertain them (Fusté-Forné & Jamal, 2021; Wirtz et al., 2021).

The ability of AI technology to execute mechanical, repetitive tasks cheaply and with no room for human error will disrupt service jobs, making it likely that service workers will gradually be replaced by robots in the future. Frey and Osborne (2017) estimate that 47% of jobs in the US are vulnerable to automation, and Lu et al. (2020) calculate this will happen by 2055. Empirically, it is believed that this wave of automation and AI technology was caused as a compensatory response to labor shortages, an aging population, and competitive needs in the industry. The New York Times estimates that by 2030, only 59 percent of adults aged 16 and older will be in the US workforce, down three percentage points from 2015 (Schneider et al., 2018; Nelson, 2017). Authors such as Fauxet (2021) estimate that by 2025, robots will substantially impact the market, reaching 1.5 billion dollars. In the United States, a robot has

already been developed to cook complex meals and serve customers by replacing an entire staff of employees. In California, a hamburger robot has been designed to fulfill up to 120 orders per hour. For its part, Café X, located in some airports, has robotic baristas that can produce up to three drinks in 40 seconds (Fauteux, 2021; Koster & Brunori, 2021; Tuomi et al., 2021).

Service robots can adapt to different environments, unlike other technologies in producing and delivering services, such as (TBSS) options, service kiosks, or pre-programmed tablets. According to Wirtz et al. (2018), a "service robot" is an autonomous system that has the capacity to adapt while interacting, communicating, and delivering services to customers. Jörling et al. 2019, for its part, add that this autonomous system can provide personalized assistance in performing physical and nonphysical tasks. Two definitions agree with the International Federation of Robotics, which describes a service robot as an autonomous robot that performs tasks without human intervention. Bowen and Morosan (2018) also add that autonomous machines could have a human, animal, or object functional morphology. For this research, service robots would be defined as adaptable, highly autonomous machines that develop physical and cognitive/analytic complex tasks during service encounters (Fusté-Forné & Jamal, 2021; Paluch and Wirtz, 2020).

Advances in AI have fueled the development of machine capabilities in response to its popularity. Autonomous machines are highly complex AI-powered systems that integrate different technology segments without human intervention (Liu & Gaudiot, 2022). These systems are widely used in various industries and customers' daily lives. For example, autonomous vehicles, smart manufacturing robots, and service robots (Chen et al., 2021; Ignatious et al., 2022; Zhang et al., 2020). These autonomous machines must also include cognitive/analytical and social/emotional skills to effectively and naturally collaborate or assist humans. Features such as action, perception, and reasoning of language, gestures, touch, and facial expressions must be built into robots to support human-robot interaction, especially in service encounters. For example, in the health care industry, a nursing robot capable of feeding patients must be able to follow the movements of the patient's head but must also understand the subtle clues that indicate when the patient is ready for the next bite through interpretation of voice, facial expressions, and patient gestures (Ahn, 2018; Lange, 2019). Cognitive/analytical skills are mental abilities that must function correctly, such as memory to retain information, processing speed, and logic to solve problems. Social/emotional skills mean the ability to analyze and regulate human emotions and display them. What authors like (X. Liu et al., 2015) call emotional Intelligence (X. Liu et al., 2015; Manivannan, 2019).

Service robots can adopt human capabilities to perform simple or complex tasks depending on the requirements of the service encounter. Service robots, such as holograms or mechanically designed robots, can be designed virtually or physically. Mechanically designed robots (physical robots) must develop their designs considering a particular environmental niche in which they are to perform. When establishing the design, the expected behavior the robot will adopt during physical tasks within the service industry should be determined, such as the social/emotional and cognitive/analytical skills necessary for customer satisfaction (Nassiraei & Ishii, 2007; Vujovic et al., 2017). Customer satisfaction is the primary goal of a service encounter. The consumer-machine interaction must be considered when deciding the most

relevant mechanical design, as well as the morphological representation of the robot, such as human, animal, or object appearance.

Anthropomorphism in robots seems to be a determining factor in consumer-machine interaction, where imitating male or female characteristics in a robot increases consumer confidence and influences decision-making related to automation technology (Belanche et al., 2020; Singh & Sellappan, 2008). Robots that include human physical characteristics such as eyes, nose, hands, arms, legs, and mouth, and nonphysical human features such as gestures, voice, or personality appear to be physically, cognitively, and socially accepted by consumers. Singh and Sellappan (2008) identified robots that mimic humans through perception, processing, and action as humanoid robots. Humanoid robots can be deployed in sensitive environments to interact with fragile service encounters such as health and in intense environments such as military usage (Chuah et al., 2021; Lyons et al., n.d.; Singh & Sellappan, 2008). While human physical features have already been developed in robots, nonphysical human parts are starting to be incorporated for their importance to customer satisfaction in the service industry. For example, an engineering company based in the UK has developed a robot named AMECA that physically looks like a person and displays human expressions such as surprise, wonder, curiosity, and happiness (Engineered Arts, 2022).

As with technology in the industrial revolution, customers have seen the evolution and growth of intelligence in robotics and AI. Robots are destined to become a pervasive aspect of modern society because of their growing ability to support the performance of human tasks while improving customers' lives (Lyons and Nam, 2021). In 1959, the first industrial robot was developed and introduced in the US as a hydraulic machine programmed in joint coordinates. Industrial robots are intended for simple tasks such as device transport, assembly, welding, and painting due to the design and purpose that have been determined according to the industry in which they work. Service robots, meanwhile, are intended for complex tasks, so they must be flexible, autonomous, and easy to operate (Savin et al., 2022; Singh & Sellappan, 2008). We listed various types of robots, their definition, possible classification labels, and examples below. This table may help entrepreneurs to identify needs and gaps in design and development efforts.

**TABLE 1 – TYPES OF ROBOTS AND EXAMPLES**

| NAME | DEFINITION | LABEL | EXAMPLES |
|---|---|---|---|
| Delta robots[1] | Its configuration includes arms with rotating or concurrent prismatic joints that can execute precise and minute movements. | Industrial robot | High-precision assembly operations robots.<br>Packaging industry robots.<br>Operating room assistant robot. |
| Polar coordinate robots[1] | Its configuration includes an arm with two rotating joints and a linear joint connected to a base with a rotating joint. The robot axes work together to form a polar coordinate, allowing the robot to work spherically. | Industrial robot | Surveillance robots.<br>Environmental monitoring robot.<br>Underwater and planetary exploration robot. |
| Articulated robots[1] | Its configuration contains a rotary joint, simulating the rotation of a human arm. It can move on flat terrain and narrow spaces. | Industrial robot | Welding robot.<br>Assembly robot.<br>Material handling robot. |
| Teleoperated robots[1,2] | Its configuration allows it to be teleoperated by a human operator who controls the robot's movements from a distance through devices such as personal digital assistant (PDA) systems or cell phones. | Industrial robot | Robots with multi-panel displays with control devices like joysticks, wheels, and pedals. |
| Hybrid[3,4] | Its configuration is based on automatic systems that use a combination of wheels (or tracks) and legs in different formations to perform locomotion. | Human server and cobot | Wheels are attached to the end of the legs.<br>Combination of wheels and legs operated independently. |
| Pre-programmed robots[5,6] | They are autonomously preconfigured, so they cannot change their behavior while working and are not supervised by humans. | Human server and cobot | Roomba Robot Vacuum[7] |
| Animatronics[8,9] | They physically look like real people or animals. They are generally used in movies and other entertainment industry settings. | Humanoid robot | Disney show/movie performance robots. |
| Bipedal[10,11] | They are configured to mimic the gait of a human being. It can be scheduled to perform some tasks as needed. | Humanoid robot | The locomotion of a bipedal walking robot with six degrees of freedom. |
| Autonomous mobile robots[12] | Its configuration allows navigation in environments without needing physical or electromechanical guidance. | Robot | Hospital assistance robots.<br>Agriculture assistance robots.<br>Services robots. |
| Automated guided robots[13,14] | Its configuration is automated and guided by a contactless guidance system that moves and transports items in production, storage, and distribution centers. | Robot | Guided carts.<br>Tow tractors.<br>Mobile picking robots. |
| Android / Gynoids | It is configured as a humanoid robot. Its design will resemble a male human (Android) or a female human (Gynoid). | Humanoid robot | Sophia[20]: Female humanoid robot capable of displaying humanlike expressions and interacting with people. |
| Humanoids[16] | It was configured to mimic the general appearance of the human body, its movements, and human interaction. | Humanoid robot | Eva: Adult-sized humanoid with emulation of human facial expressions, head movements, and the ability to speak, using 25 artificial muscles.[15] |

| | | | |
|---|---|---|---|
| Cobots[17,18] | Its configuration allows one to physically interact with humans in a shared workspace. | Humanoid robot | Object position robot.<br>Bar code identification machine. |
| Augmenting robots[19] | Its configuration generally allows for enhancing a person's capabilities or replacing abilities that a person has lost. | Humanoid robot | Robotic prosthesis in medicine. |
| Social robots[22,23] | Its configuration is the same as a humanoid robot but programmed to "socially" interact with humans and provide physical and emotional support. | Humanoid robot | Asimo[22]: Can understand and respond to simple voice commands and recognize the faces of a select group of individuals. |
| Biohybrid robots[24] | They are composed of biological and synthetic components that have the potential to be fully autonomous, intelligent, and self-assembled. Capable of learning from previous experience and repairing their damage or injury. | Humanoid robot | Biologically inspired manta ray-shaped robot. |
| Sources: [1] Process Solutions (2018), [2] Valero-Gomez and De la Puente (2011), [3] IGI Global (2022), [4] De Luca et al. (2021), [5] Gottlieb and Anderson (2011), [6] Das (2022), [7] Forlizzi and DiSalvo (2006), [8] Stan Winston School of Character Arts (2015), [9] Baradwaj (2020), [10] Perkins (2021), [11] Lim and Yeap (2012), [12] Jacoff et al. (2002), [13] Bore et al. (2019), [14] Lin et al. (2021), [15] Faraj et al. (2021), [16] Song and Kim (2022), [17] Biton et al. (2022) and Beuss et al. (2021), [18] & [19] Gottlieb and Anderson (2011), [20] Hanson Robotics, (2022), [21] Sakhineti and Jayabalan (2020), [22] Okita et al. (2009), [23] Piçarra and Giger (2018), [24] Mestre et al. (2021) | | | |

Table 1 highlights the different types of robots based on their design and programming. Industries have been a niche for robot technology and development. In the manufacturing industry, for example, robots with a mechanical structure capable of performing complex tasks with high precision, such as delta and polar coordinates, and articulated robots are the most used and demanded. The retail industry, for instance, has adopted robots to perform repetitive tasks performed by teleoperated, hybrid, and pre-programmed robots. At the same time, the service industry has adopted robots such as autonomous mobile robots, automated guided robots, cobots, social robots, and humanoids to be the most flexible regarding the environment or task adaptability. The variety of robot combinations has become a very popular and demanded market in recent years, which is why Reshetnikova and Pugacheva (2022) expect the robot market to exceed 61.4 billion dollars by 2025, while Chuah et al. (2021) forecast just $102.5 billion for service robots by 2025. The use of AI is growing, and despite its relevance and current popularity in customers' lives, finding other robot developments was not easy. Table 1 summarizes the most popular robots, but the spectrum is even broader, so more research is needed for better insight.

The current study proposes a task-oriented physical robot deployment model by skills (Figure 1), including social/emotional, cognitive/analytical, and physical skills. As Moon and Anitsal (2002) did with the TBSS, this article presents a helpful classification of service robots to understand the possible combinations, interactions, and full potential of skills based on the complexity of the tasks. According to their complexity, the tasks are performed based on three different types of AI: Mechanical AI, Thinking AI, and Feeling AI (Huang & Rust, 2021). The

types of AI provide a better understanding of the possible tasks performed by service robots covered in this article. Mechanical AI focuses on tasks with standardized, consistent, and reliable results. Some examples would include high-precision object positioning, packaging, and assembling. Thinking AI focuses on tasks that provide customer personalization, for example, voice and face recognition, weather-based outfit suggestions, and memorizing customer preferences (Huang & Rust, 2021; Klein et al., 2020). Feeling AI focuses on tasks based on emotional intelligence, such as recognizing and responding to customer emotions, displaying own emotions, and empathy (Huang & Rust, 2021; Sayed & Gerwel Proches, 2021).

Service robots that share a work domain with customers should be able to handle multiple tasks simultaneously with real-time responses. Service robots cannot fully satisfy all customer demands with autonomous decision-making. Service robots currently lack emotional intelligence and inference mechanisms to predict customer requirements. So far, task-oriented service robots have been developed based on human skills (Kim & Yoon, 2014; Letheren et al., 2021). The classification of robots in the service industry can be represented by interactions between customers, employees, and robots with three types of skills. (1) social/emotional skills, such as emotional intelligence or expression of emotions; (2) cognitive/analytical skills, such as communication or long-term memory; and (3) physical skills, such as lifting weights or moving steadily. The skills of service robots are based on three types of AI (Mechanical, Thinking, and Feeling) and are tied to the simplicity or complexity of the assigned task (Wirtz et al., 2021).

**Social/emotional skills for simple and complex tasks: *(1a and 1b)***

The use of social/emotional skills to perform simple tasks is shown as (1a) in Figure 1 by human servers and collaborative robots (cobots) based on Feeling AI. Cobots are designed to work with humans simultaneously in the same workplace. For example, in the health industry, cobots are integrated into simple surgical processes, such as routine oral and maxillofacial interventions (Chromjakova et al., 2021; Huang & Rust, 2021). The cobot is programmed to predict the doctor's activities based on different parameters using systems that have copied the movements of the human assistant to transfer them to the robot. In this scenario, the human-robot social/emotional interaction is as simple as a movement assistant (Beuss et al., 2021). When complex tasks are combined with social/emotional skills, it is determined as (1b) and performed by a partial employee. The customer acts as a partial employee by performing some tasks by themselves, replacing specific tasks performed by service providers, improving customer satisfaction (Hsieh et al., 2004). In the retail industry, self-checkout systems have been implemented to provide a good experience for customers, allowing them to scan items and pay for them without interacting with human employees and providing more privacy during service delivery. Hence, the quality of service falls mainly on the customer (Aquilina & Saliba, 2019).

**Cognitive/analytical skills for simple and complex tasks: *(2a and 2b)***

The use of cognitive/analytical skills to perform simple and complex tasks is shown in (2a) and (2b), respectively, based on Thinking AI and performed by robots. Robots with cognitive/analytical capabilities based on thinking artificial intelligence are mainly programmed

to perform personalized tasks for the client according to their preferences. In simple tasks, for example, the robots are programmed to recognize the commands of a customer through their voice (Gundogdu et al., 2018). Robot programming uses a metaprogramming approach that allows customers to customize simple commands such as move, select, and drop with their voices. While in complex tasks, the robots are programmed, for example, with an algorithm for recognizing orders and customer habits, which can open various types of doors in a house in the same way and at certain times based on the daily routine of the client, without the need for the client to command it (Li & Meng, 2015; S. Park, 2020).

**Physical skills for simple and complex tasks*: (2a and 2b)***

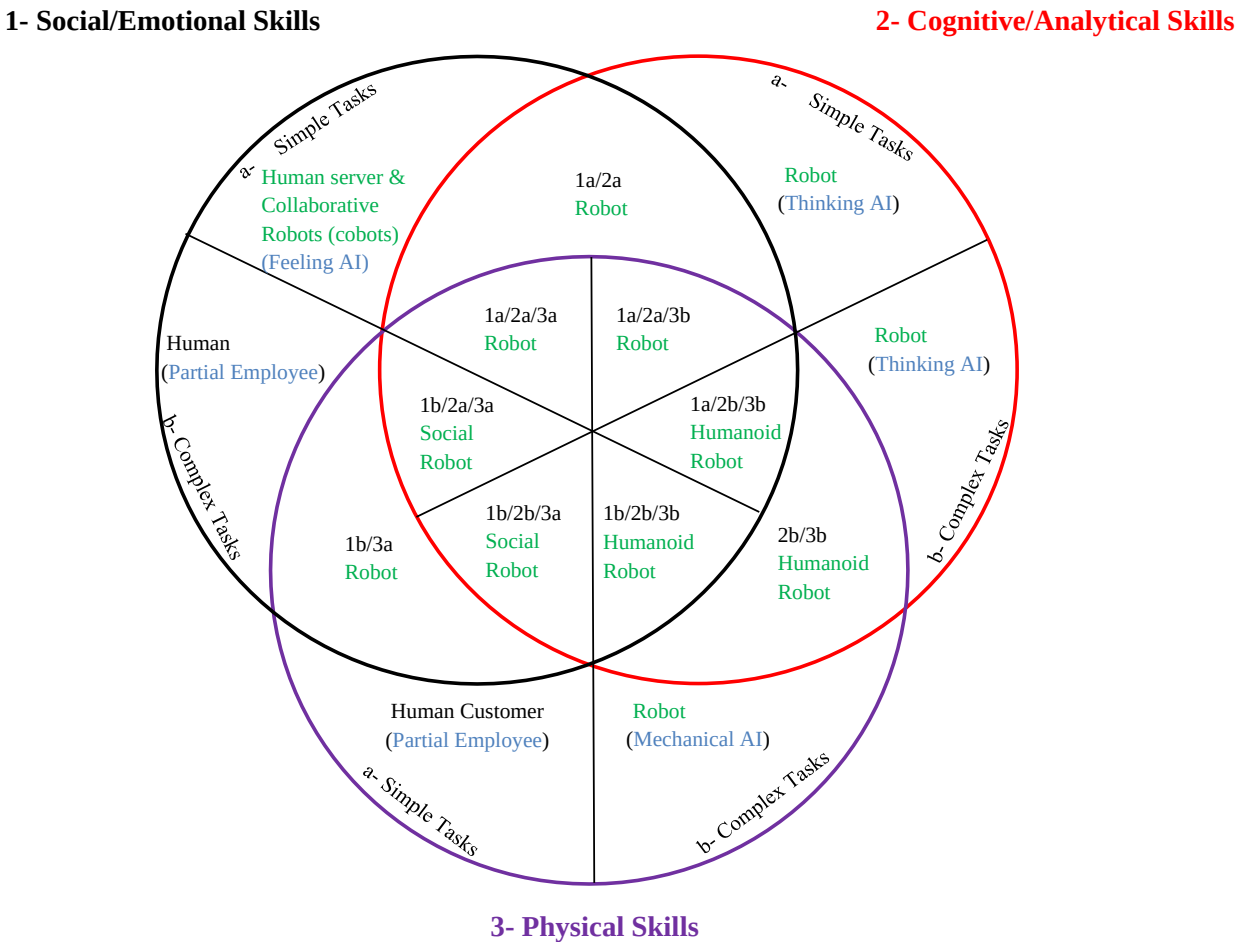
When physical skills and simple tasks are combined, as seen in (3a), they are performed by a Human Customer (Partial Employee). A simple job with physical skills could be seen in the self-checkout example. Customers are expected to scan each product on the scanner, pack them in bags, and pay manually (Aquilina & Saliba, 2019; Considine & Cormican, 2016). The use of physical skills to perform complex tasks is denoted as (3b) and performed by mechanical AI-based robots focused on precision and standardized results. For example, the Roomba robotic vacuum cleaner is capable of moving autonomously around any surface, such as wood, ceramic, or carpet. Its programming allows it to brush and vacuum even the most minor dirt and dust in seconds, while a human would take hours. (Forlizzi and DiSalvo, 2006).

**Intersections of social/emotional and cognitive/analytical tasks**

At intersections, we see lots of opportunities for robot development. Simple tasks performed with social/emotional and cognitive/analytical skills are represented as (1a/2a) and are performed by a robot. The robot can assist a human employee in simple tasks based on feeling AI and thinking AI. For example, in a laboratory where SARS-CoV-2 tests are carried out, the assistants were helped by automation, where a robot assumed the role of laboratory technician. The robot assists in simple activities such as sample preparation, pipetting, and liquid handling under the supervision of the human employee as a simple human-machine interaction (Zanchettin & Facciotti, 2022). Robots can also develop physical skills to perform simple and complex tasks. The performance of simple duties in this type of robot is denoted as (1a/2a/3a). This means the robot can move autonomously in an austere environment like a laboratory. Performing complex tasks with physical skills in the same scenario is denoted as (1a/2a/3b) and means, for example, the robot can take and transport the samples for later processing stably.

The utilization of social/emotional skills to perform complex tasks and physical skills to perform simple tasks is denoted as (1b/3a) and performed by a robot. The robot can interact with customers, but its physical skills are simple. For example, in self-checkout systems, the machine is capable of interacting with the customer by giving visual and voice instructions through the screen but physically is capable of weighing the fruits or vegetables once the customer places them on the scale (Aquilina & Saliba, 2019; Considine & Cormican, 2016). (1b/3a) based robots can also develop cognitive/analytical skills to perform simple and complex tasks and become social

**FIGURE 1 - A MODEL OF TASK-ORIENTED PHYSICAL ROBOT DEPLOYMENT BY SKILLS**




Sources: Extended from Wirtz et al. (2018), Wirtz, Kunz, and Paluch (2021); Colgate et al. (1996); Huang and Rust (2020); Belanche et al. (2020); Chromjakova et al. (2021); Beuss et al. (2021); Stipancic et al. (2021); (Hsieh et al. (2004) robots. Social robots are explicitly designed to be "social" and improve human-robot interactions (Coeckelbergh, 2021; Zonca et al., 2021).

The involvement of cognitive/analytical skills to perform simple tasks is denoted as (1b/2a/3a). This means that social robots, for example, process the product's price based on its weight while giving instructions to the customer (Coeckelbergh, 2021). Performing complex tasks with cognitive/analytical skills is denoted as (1b/2b/3a). Here, the social robot can reach a higher level of AI, and for example, the PLEA robot was designed as a teaching social robot. PLEA is an autonomous humanoid head capable of teaching and interacting with students in a classroom just as a teacher. PLEA can also assess and predict students' emotional states and alter

the teaching process by changing the tone of voice or asking questions about the student's state of mind and self-understanding. (de Montfort University, 2021; Stipancic et al., 2021).

The performance of complex tasks using cognitive/analytical and physical skills is denoted as (2b/3b) and is performed by a humanoid robot. The humanoid robot is designed to mimic the general appearance of the human body and its movements. Physically, humanoid robots look like humans and can mimic simple physical tasks, such as head movements and facial expressions, and their cognitive/analytical skills are as complex as a robot (Faraj et al., 2021; Pepito et al., 2020). The entertainment industry has pioneered the use of humanoid robots, but they have been cataloged as animatronics because they are designed to entertain customers rather than interact with them. When social/emotional skills get involved, the scope of tasks performed by humanoid robots changes (Baradwaj Yellenki, 2020; Stan Winston School of Character Arts, 2015).

A humanoid robot programmed to perform complex tasks with cognitive/analytical and physical abilities but simple tasks with social/emotional skills is denoted as (1a/2b/3b). Examples of this combination of skills and tasks can be seen in the entertainment industry, such as casinos. Some casino owners in Las Vegas have started using a robot prototype to replace the dealers. The humanoid robot is a prototype called Min, which physically looks and mimics a dealer, can perform card dealing functions, and even detect cheating during gameplay, but still without social interaction with customers. (McCoy, 2019). In the past few years, authors such as (Chiang et al., 2022) state that humanoid robots have begun to be designed under experimental conditions to perform complex tasks with social/emotional skills, such as recognizing facial emotions, movements, or sounds of customers. For example, a robot named Ameca has been popularly listed as the world's most advanced and realistic humanoid robot. The robot has been designed by Engineering Arts, a company dedicated to manufacturing humanoid entertainment robots for companies, theme parks, and science centers (Alfonso, 2022; Gomez, 2021). Ameca is currently a prototype with an artificial intelligence and machine learning platform that stores data in the cloud while interacting effectively with customers. Ameca has a combination of artificial limbs and ligaments that simulate human movements. The robot can smile, blink, show surprise, and scratch its nose. Ameca can also detect people, track their faces, detect objects, and even have fun looking at a customer (Osmond, 2022; Yi Joey, 2022). This humanlike robot aims to bridge the gap between customers and digital life. Its current software makes the humanoid robot ideal for customer service; however, its developers seek to improve its software to be constantly reprogrammed and updated by adding new functions (Alfonso, 2022; Gomez, 2021).

## MANAGERIAL IMPLICATIONS AND FUTURE RESEARCH AVENUES

Robots have moved from the traditional manufacturing industry into human environments such as work and personal life (Savin et al., 2022). Combining technology and artificial intelligence has allowed robots to respond to different environments and adapt to various industries, such as the service industry. The changing nature of the industry and factors such as COVID-19 have driven services such as hotels, restaurants, and health centers to rely on technology to meet their needs. The imposed distancing and labor scarcity as pandemic consequences have pushed robots to take jobs with repetitive tasks. Authors such as Paluch and

Wirtz (2020) point out that AI and robots have also begun to take a dominant role in customer service in response to said isolation and restrictions. Robots have started to develop more abilities that allow them to perform mechanical and analytical tasks beyond the traditional ones used by industrial robots.

The service industry has been cataloged as an industry of high quality in customer satisfaction (Choi et al., 2020; Lu et al., 2020). Today, we see robots capable of performing complex tasks to serve customers in restaurants and hotels or as a human-machine team in technology-based self-service trying to bring an excellent experience to customers (Anitsal et al., 2002; Wirtz et al., 2021). However, El-Said and Al-Hajri (2022) argue that many researchers in the "customer service" field conclude that there is a general preference for human service in the service industry. AI has not yet reached the point of fully satisfying the service industry. Robots cannot match the quality of service characterized by personalized service, the human touch, and authentic customer-employee interactions. The key to successful service delivery is to ensure pleasant interactions for those involved. A pleasant interaction with a customer includes empathy and emotional intelligence from the service provider (Ho et al., 2020; Prentice et al., 2022; Sayed & Gerwel Proches, 2021).

In order to reach customer satisfaction, the goal of service delivery, robots should include natural human basic skills. According to Turja et al. (2022), in addition to physiological requirements, customers have basic psychological needs, such as feelings of competence, autonomy, and social relatedness. Huang and Rust (2021) have identified three types of AI, Mechanical AI, Thinking AI, and Feeling AI, to which service robots are adaptable and on which they are based to perform simple or complex tasks according to customers' requirements. Service robots have been dispersed into different categories to meet customers' needs, based on the combination of human skills and artificial intelligence to carry out various tasks within the service industry.

Considering the necessity of social/emotional, cognitive/analytical, and physical abilities, in combination with AI and the complexity of their tasks, a classification of robots according to a specific environment and purpose is needed (Huang and Rust, 2021). For example, conversational agents or chatbots use a combination of social/emotional skills and cognitive/analytical skills to perform simple tasks, such as conversing verbatim or with voice. Also, recognize customer requests by predicting customer behavior through feeling and thinking and thus propose solutions. When the physical capability, the ability for autonomous mobility, is added to the chatbot, we are no longer talking about a virtual assistant but a physical assistant. This physical assistant can be used, for example, in the care of the elderly, not only providing them with company through conversations but also helping them with physical tasks such as making their bed (Biton et al., 2022). The robot with the three abilities moves to another environment where its social/emotional and cognitive/analytical skills are needed. Still, its physical ability takes it to a more advanced level, reaching another audience and performing different tasks.

Japan, South Korea, the United States, and some European countries have been pioneers in implementing service robots and investing in their development (Ward and Ashcraft, 2010). There is a distinction in the adoption of robots in advanced and developing countries, as

discussed by De Vries et al. (2020). Investment in robotization is closely linked to the economic capacity of the country's industries where it is implemented. Therefore, it is inferred that since developing countries have an emerging economy with a lot of inexpensive labor available, investment in technological structure is not as significant as in advanced countries (Awnan and Ali Khan, 2015; Vo et al., 2017). To facilitate the implementation of robots in the service industry in countries with emerging economies, this study suggests developing and implementing policies that allow the identification of the economic and structural benefits after adopting service robots in companies. Companies will adopt service robots as long as they show technical and economic feasibility. Once implemented, robots improve the provision of services and, therefore, generate benefits above costs (Berg et al., 2016; Miller, 2017). Investing companies are also invited to assess the potential of markets in emerging economy countries for possible technology investments, considering the potential of these economies mentioned by (Awnan and Ali Khan, 2015). Regarding expectations, such as steady economic growth in the future due to a younger active population, the development of consumer markets, the expansion of the middle class, and the increase in exports may influence the adoption of service robots in emerging economies as well as the post-implementation economic benefits.

Once robotization reaches multiple countries with different economic structures, a wave of robots could spread into the markets and customers' personal lives, providing them many options, just as the internet did (Castells, 2013; Hackl, 2020). The current study shows how different skill combinations rank robots. Until now, the most advanced service robots are humanoid robots. In addition to having the three social/emotional, cognitive/analytical, and physical abilities, they can perform complex tasks while mimicking humans. Humanoid robots look not only physically similar to human beings but also display similar psychological states by recognizing customers' facial emotions, movements, or sounds under experimental conditions (Belanche et al., 2020). Söderlun (2022) points out that even several existing robots seem to recognize themselves in a mirror, an ability that requires a relatively advanced form of intellect. Researchers such as Saegusa et al. (2014) and Stoytchev (2011), mentioned by Söderlund (2022) in his paper, have noted that once robots are truly capable of recognizing themselves, this would improve their abilities to interact with customers, use new tools, self-repair or even become a customer.

## LIMITATIONS AND CONCLUSION

Service robots are a fast-developing area in the services industry, especially gaining momentum after the COVID-19 experience, so much so that market development is way ahead of academic business research. In this conceptual paper, we intend to explore, summarize, and organize the recent developments in automation and artificial intelligence pertaining to the service industry. We recognized a gap between academic discovery and marketplace applications regarding service robots.

Our research enabled us to design a framework to direct research to analyze customer-employee-technology interactions based on the skill sets of related parties. As far as we know, this framework may be one of the first attempts to organize robot development activities around the necessary skills in service marketing. The framework is definitely not exhaustive, as the

research is moving very fast. We focused on the social/emotional, cognitive/analytical, and physical skills as the most relevant in customer, employee, and technology relationships in multitude of service situations. There may be other variables that are worth considering. Development of such variables, data collection, and analysis methods are beyond the scope of this paper.

As indicated in the future research avenues section, the design and development of service robots and their impact on customer-employee-technology interactions are wide open for new research. Even though we have not approached this topic from any existing research philosophy perspectives in mind, the framework may help researchers from positivist or relativist paradigms design their investigations better. Indeed, the opportunities for further research make this topic very exciting.

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# TRANSFORMING HEALTHCARE: THE ROLE OF MOBILE TECHNOLOGY IN DEVELOPING NATIONS

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**ABSTRACT**

*Mobile technology has the power to make an impact, on healthcare in developing nations. It has the ability to enhance healthcare accessibility and empower individuals to take charge of their well-being and enable the collection of real time health information. Nevertheless, there are obstacles that must be overcome including infrastructure, concerns regarding data privacy and disparities in access. The main goal of this research article is to explore how mobile technology affects healthcare systems in developing nations identifying patterns, difficulties and potential advantages. We conducted a comprehensive review on previous studies and systems that focus on the utilization of technology, in healthcare, within developing nations. This article examines how mobile technology influences healthcare systems in developing nations. It highlights patterns, obstacles and prospects while providing insights, into how these systems can utilize mobile technology to enhance the accessibility, quality and efficiency of healthcare services.*

**Keywords:** *mobile technology, mobile health, mHealth, healthcare, developing countries, impact.*

## INTRODUCTION

The digital revolution is currently taking place worldwide. One significant factor driving this change is the use of mobile technology. Smartphones and tablets have seamlessly integrated into our daily lives with 5.28 billion people using phones globally in 2021 (Statista, 2021b). These devices have revolutionized aspects of our routines but their impact on healthcare stands out as particularly remarkable. Mobile technology has proven to be a tool in improving access to healthcare services enhancing delivery methods and achieving outcomes especially in developing nations.

Healthcare, in developing nations is commonly marked by limitations in resources, insufficient infrastructure and unequal access to services. As a result, people in these areas face difficulties in obtaining high quality healthcare, which contributes to the prevalence of diseases, increased mortality rates and a decline in well-being (World Health Organization, 2018). Fortunately, mobile technology presents a solution that could help tackle these healthcare issues.

A "developing nation" is typically defined as a country with a lower level of industrialization, lower standard of living, and lower Human Development Index (HDI) compared to more developed countries. These nations often face challenges such as higher poverty rates, limited access to healthcare and education, and inadequate infrastructure.

Developing nations are countries with a lower standard of living, underdeveloped industrial base, and low Human Development Index (HDI) relative to other countries. They often have lower per capita income levels, less access to healthcare and education, and generally lower life expectancy (UNDP, 2020; World Bank, 2021).

Through this investigation we delve into how mobile technology can enhance healthcare in developing countries. Our goal is to showcase the impact that mobile technology has on delivering healthcare services. By analyzing a collection of research case studies and reports we explore the prominent patterns, obstacles and prospects associated with mobile technology in the healthcare sector of developing nations.

It's undeniable that mobile technology has spread rapidly across the world. In 2021 there were 5.28 billion individuals using phones, which accounts for roughly 67.5% of the global population (Statista, 2021b). The availability and affordability of devices, in economically disadvantaged areas with limited resources have played a significant role in this widespread adoption. Developing countries in particular have witnessed growth in mobile phone usage over the twenty years with a substantial increase in mobile phone subscriptions.

The widespread use of technology offers a chance to address healthcare disparities in developing nations. By utilizing the capabilities of devices and networks we can extend healthcare services to underserved populations improving accessibility and ultimately leading to better health outcomes.

One significant result of the merging of technology and healthcare is the concept known as Mobile Health or mHealth. MHealth involves using smartphones, tablets, and other mobile devices to provide healthcare services, facilitate medical research and promote health related information and awareness (World Health Organization, 2011). The applications of mHealth are wide including the dissemination of health information, telemedicine services, remote patient monitoring and portable diagnostic tools.

The realm of mHealth has grown rapidly with an increasing number of applications and platforms, for both healthcare providers and consumers. These applications empower individuals to take charge of their health by granting access to information enabling remote consultations with healthcare professionals and facilitating the tracking of important health metrics. Notable examples include fitness apps that help users stay active, medication reminder apps that ensure adherence to treatment plans, as well as platforms that provide mental health support.

In developing countries particularly mHealth has emerged as a game changer by addressing the limitations in healthcare systems. For example, the use of health (mHealth) applications allows community health workers to reach villages monitor patients and gather important health data—all through their smartphones. This capability to expand healthcare services to populations has the potential to greatly impact healthcare outcomes in resource limited settings.

Mobile technology holds promise in reshaping healthcare delivery in developing countries across essential aspects, including improved accessibility, remote monitoring, dissemination of health information, data collection and surveillance and more. However, while the potential benefits are substantial there are also challenges and barriers that must be

addressed. These include infrastructure development, bridging the divide, ensuring data security and privacy measures, navigating regulatory changes and so on.

Ultimately mobile technology has emerged as a force in delivering healthcare in developing countries. The adoption of mHealth solutions can enhance accessibility to quality care, iImprove the efficiency of healthcare services—ultimately leading to health outcomes for millions of individuals. Although challenges exist along this path, proactive measures such as infrastructure development initiatives promoting inclusion efforts implementing robust data governance can pave the way for a brighter and healthier future, in developing nations.

This research delves further into these factors utilizing a range of studies to offer a comprehension of how mobile technology contributes to the transformation of healthcare in developing nations.

## LITERATURE REVIEW

Mobile technology has revolutionized healthcare in developing countries where access, to quality healthcare is often restricted by resources and infrastructure. This review paper provides an overview of the subjects, trends, obstacles and possibilities associated with leveraging technology to enhance healthcare services in those nations.

A key focus in the existing literature on technology in healthcare revolves around the adoption of mHealth applications and services. MHealth encompasses a range of tools and platforms aimed at improving access to healthcare, delivery of services and overall outcomes. For example, telemedicine apps allow healthcare providers to connect with underserved populations by offering consultations (Free et al., 2013). Mobile apps and text messaging services are utilized for distributing health information and promoting health literacy (Chib et al., 2013). Wearable devices and mobile apps enable monitoring of patients those with chronic illnesses (Labrique et al., 2013). Real time data collection facilitated by technology plays a role in disease surveillance and epidemiological research (Blaya et al., 2010). Moreover, initiatives utilizing technology have successfully improved child health through methods, like SMS based appointment reminders and educational programs (Atnafu et al., 2018).

Mobile health (mHealth) has the potential to educate individuals on diseases and their risk factors promote behaviors and offer reminders for vaccinations and preventive care. It can also aid in monitoring patients health status reminding them to take medications and providing support for self-management. Furthermore, mHealth can play a role in tracking the spread of diseases identifying outbreaks and coordinating response efforts.

One significant advantage of technology is its ability to extend healthcare services, to remote and underserved populations. Various studies have highlighted that mHealth interventions have effectively improved access to healthcare in areas where medical facilities are scarce (Free et al., 2013). By bridging barriers, mobile technology enables healthcare professionals to deliver care in inaccessible regions (Labrique et al., 2013).

However, it is important to acknowledge that there are challenges and barriers associated with implementing technology in healthcare within developing countries. Limited network coverage and unreliable electricity supply pose obstacles for mHealth solutions in those areas

(Tomlinson et al., 2013). Additionally, there is a divide where marginalized populations face restricted access to smartphones and mobile data exacerbating inequalities (Meurs et al., 2019).

Concerns regarding the security and privacy of data arise when it comes to mHealth as it involves the collection and transmission of health information (Aranda-Jan et al., 2014). The absence of frameworks for mHealth apps and services creates legal and ethical uncertainties (Fernandez-Luque & Bau 2015).

Various research studies have explored the influence of technology, on healthcare results. For instance, mHealth interventions have demonstrated promise in enhancing vaccination rates (Zurovac et al., 2013), decreasing child mortality (Atnafu et al., 2018), and effectively managing diseases (Labrique et al., 2013). These findings emphasize the improvement, in healthcare outcomes that mobile technology can bring to developing countries.

The literature suggests opportunities and future directions for using technology in healthcare within developing countries. Governments and organizations are encouraged to invest in improving infrastructure, such as expanding network coverage and ensuring electricity supply (Mars et al., 2014). Initiatives that bridge the divide through smartphones, digital literacy programs and subsidies for mobile data access can promote fair access to mHealth solutions (Meurs et al., 2019). It is crucial to develop data governance frameworks and ethical guidelines to ensure use of patient data, in mHealth applications (Mars et al., 2014). Governments, healthcare providers, technology companies, and researchers must come together to collaborate and find solutions, for the healthcare challenges faced by developing countries (Bashshur et al., 2015).

In a nutshell, based on the literature it is indicated that mobile technology has the potential to bring about a transformation, in healthcare delivery within developing countries. Its utilization in mHealth applications and services can lead to improvements in accessibility, health outcomes and the resolution of healthcare disparities. However it is essential to overcome challenges such as infrastructure limitations, bridging the divide and addressing concerns regarding data privacy to fully capitalize on the capabilities of technology, in these regions.

## Gap the Current Study Aims to Address:

The literature review reveals that most existing studies on mHealth applications focus on developed countries, leaving a substantial gap in the context of developing countries. The review identifies several key areas where research is lacking:

***Effectiveness and Impact:*** There is limited empirical evidence on the effectiveness and impact of mHealth applications in developing countries. Existing studies often lack rigorous methodologies and comprehensive evaluations.

***Challenges and Barriers:*** The literature indicates that there are numerous challenges and barriers to the successful implementation of mHealth applications in developing countries, including technological, infrastructural, financial, and cultural factors. However, detailed analyses and solutions to these challenges are sparse.

***User Acceptance and Adoption:*** Understanding the factors influencing user acceptance and adoption of mHealth applications is crucial for their success. Yet, there is insufficient research on these factors within the context of developing countries.

***Sustainability and Scalability:*** Studies on the sustainability and scalability of mHealth interventions are limited, particularly regarding how these applications can be integrated into existing healthcare systems in developing countries.

The current study aims to address these gaps by conducting a comprehensive analysis of mHealth applications in developing countries. It aims to fill the significant research gaps identified in the literature by providing comprehensive and empirical insights into the effectiveness, challenges, user acceptance, and sustainability of mHealth applications in developing countries. This will ultimately contribute to more informed and effective deployment of mHealth technologies, improving healthcare delivery and outcomes in these regions.

## RESEARCH METHODOLOGY

To fully comprehend the potential of mobile technology in healthcare, a systematic literature review (SLR) approach was adopted to collect freely available online content and articles published. Brocke et al. (2015) recommends that researchers conducting SLRs should make clear decisions on selecting databases and journals, defining search terms, selecting criteria for including and excluding papers, and developing strategies for citation analysis. In this particular study, special emphasis was placed on collecting sample articles from various database sources, including the open-access Google Scholar database, SCOPUS, IEEE, Science Direct, and ACM due to the innovative nature of mobile technology and the longer time frames required for reviews.

The criteria for inclusion of content in the review required that the article be published in complete form, whether in a journal, conference proceedings, technical report, white paper, or blog, and be written in English. Various search terms such as “mobile health in developing nations/countries”, mobile technology in healthcare”, “mHealth in developing nations/countries”, etc. were used to satisfy PRISMA conditions (Moher et al., 2009). The PRISMA framework specifies an evidence-based minimum set of items for reporting in systematic reviews and meta-analyses and has been widely utilized in academic studies (Kruse et al., 2016).

Using PRISMA for the analysis allowed for the employment of guidelines to review clearly formulated questions and use systematic and explicit methods to locate, select, and critically evaluate relevant publications to address the research questions identified earlier. In addition to academic publications, technical reports and prominent blogs were reviewed to ensure the rapidly changing nature of mobile technology is reflected in the study.

Fig. 1 displays the screening and selection process of the artifacts finalized for the study.

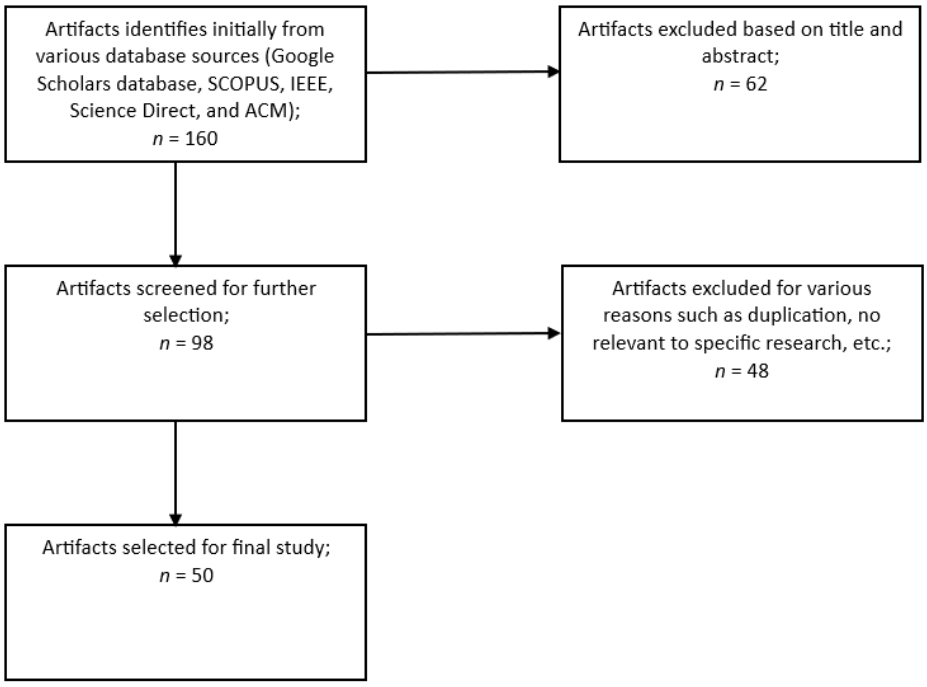


**Fig. 1. Screening and selection process of the artifacts finalized for the study.**

## MAJOR APPLICATIONS AND SERVICES

Some of the major applications and services of mHealth in developing countries are described below.

### Mobile-Based Health Information Services

Mobile phones are extensively used in developing countries to share health information through text messages or phone calls. These messages cover topics, like child health, nutrition, disease prevention and family planning. The main goal of health information services is to improve peoples knowledge, about health and promote practices (Chib et al., 2013).

### Telemedicine and Remote Consultations

Telemedicine applications allow healthcare professionals to remotely consult with patients in areas that lack medical services. Patients have the ability to connect with doctors or specialists via video calls or text messaging, facilitating diagnosis, treatment and access to guidance (Free et al., 2013).

### Mobile-Based Data Collection and Disease Surveillance

Mobile technology is extensively utilized in healthcare research, epidemiology and disease surveillance, for data collection purposes. Health professionals and researchers leverage devices to gather real time information regarding disease outbreaks, vaccination rates and health indicators. This allows for prompt responses to public health issues (Blaya et al., 2010).

### Medication Adherence and Health Monitoring

Mobile apps and text message reminders are used to improve the adherence of patients, with illnesses such as HIV/AIDS, diabetes and hypertension. These tools assist patients in keeping track of their medication schedules and offering information to healthcare providers (Labrique et al., 2013).

### Maternal and Child Health Services

Health (mHealth) apps play a role, in enhancing the well-being of both mothers and children. They achieve this by sending text messages containing advice, on pregnancy, infant care, appointment reminders and vaccination schedules. The primary goal of these services is to minimize mortality rates, safe childbirth practices and guarantee that children receive the necessary healthcare services they require (Atnafu et al., 2013).

### Emergency Response and Disaster Management

Mobile technology plays a vital role, in emergency response and disaster management. It enables authorities and first responders to effectively coordinate relief efforts, share information, and provide assistance to communities affected by disasters and health emergencies (Mars et al., 2013).

### Mobile-Based Point-of-Care Diagnostics

The use of technology, for point of care diagnostics is on the rise. Healthcare professionals can now utilize devices and smartphone applications to perform diagnostic tests in resource limited settings, including infectious diseases, like HIV or malaria. This advancement allows for diagnosis and prompt initiation of treatment (Drain et al., 2014).

### Mobile-Based Nutrition and Dietary Support

Mobile applications and messaging platforms provide resources, for individuals and families offering information assistance with meal planning and advice, on maintaining a diet. The objective of these tools is to address malnutrition concerns and promote the adoption of eating habits (Haberer et al., 2016).

### Mobile-Based Health Financing and Insurance

Mobile technology plays a role, in making health financing and insurance schemes more accessible. It enables individuals to conveniently pay for healthcare services, premiums and insurance coverage using wallets or payment platforms (Chen & Chen., 2018).

### Mobile-Based Mental Health Support

Mobile health applications offer assistance, for well-being encompassing stress reduction techniques, therapy sessions and the ability to track mood changes. These applications are designed to tackle the increasing health issues faced by developing nations (Kaonga et al., 2019).

### Mobile-Based Maternal and Neonatal Health Monitoring

Healthcare providers can utilize applications to monitor the health of both mothers and newborns effectively identifying any potential concerns that may arise throughout the pregnancy and childbirth process. This innovative technology plays a role, in minimizing the risk of mortality as highlighted by Lund et al. (2012).

### Mobile-Based Pharmacy and Drug Information Services

Mobile apps and text messaging services offer ways for patients to access information, about medications, receive reminders to take their medication and locate pharmacies (Hall et al., 2016).

These mobile health applications and services have an impact, on enhancing healthcare availability, delivery and results in developing nations by utilizing the presence and easy accessibility of mobile phones.

## MAJOR EXAMPLES OF SUCCESSFUL MHEALTH INTERVENTIONS IN DEVELOPING COUNTRIES

Some major examples mHealth interventions in developing countries are described below.

### Mobile Telemedicine in Rwanda

The "Mobile Telemedicine and eHealth" program, in Rwanda has been remarkably successful, in leveraging technology to facilitate healthcare consultations from a distance. This initiative allows healthcare professionals working in areas to connect with medical experts located in urban centers guaranteeing that patients receive prompt and expert attention. As a result, this initiative has made strides in enhancing healthcare accessibility within underserved

regions of Rwanda, where the availability of healthcare infrastructure's limited (Hansen et al. 2016).

**SMS-Based Vaccination Reminders in India**

In India there have been efforts to improve child vaccination rates through the use of SMS based reminder systems. Parents receive text messages reminding them of vaccination appointments, which helps to reduce instances of missed vaccinations and ultimately enhances immunization coverage. This initiative has proven to be effective, in safeguarding child health by preventing diseases that can be prevented through vaccines (Sahni et al., 2019).

**Mobile-Based Maternal Health Education in Bangladesh**

The MAMA (Mobile Alliance for Maternal Action) program, in Bangladesh is dedicated to providing women and new mothers with maternal health information through mobile phones. They receive SMS and voice messages that offer guidance on postnatal care, family planning and newborn care. This initiative has shown improvements, in child health outcomes by enhancing knowledge and encouraging healthy behaviors (LeFevre et al., 2014).

**Mobile-Based Tuberculosis (TB) Treatment Support in Pakistan**

In Pakistan there is a healthcare initiative called "mTIBB" that helps patients with tuberculosis (TB) using phones. Patients receive text messages to remind them about taking their medication, notify them about appointments and provide them with health education messages. This program has proven effective in improving the rates of adherence, to treatment and reducing interruptions in treatment, for TB patients ultimately contributing to control of the disease (Fatima et al., 2019).

**Mobile-Based Data Collection for Disease Surveillance in Ghana**

In Ghana the use of technology has been implemented to monitor diseases and gather data. Health workers utilize devices to report disease outbreaks and collect epidemiological information, in real time. This advancement has resulted in enhanced efficiency and precision in disease reporting allowing for responses, to outbreaks and improved management of health (Asemahagn et al., 2020).

**Mobile-Based Antenatal Care in Tanzania**

The Wazazi Nipendeni (Love me Parents) program, in Tanzania makes use of phones to offer mothers with important information about antenatal care and reminders for their appointments. Pregnant women receive text messages and phone calls that provide guidance on care, nutrition and getting ready for childbirth. This initiative has led to an increase in the

utilization of healthcare services and played a role in promoting safer pregnancies and childbirth experiences (Lund et al., 2012).

**Mobile-Based Diabetes Management in India**

In India the mDiabetes initiative provides assistance to people, with diabetes by utilizing technology. Individuals receive text messages containing guidance, medication reminders and tips on monitoring their blood glucose levels. This program has resulted in enhanced management of diabetes adherence to treatment plans and improved control over levels, among those involved (Kumar et al., 2017).

**Mobile-Based Family Planning Services in Kenya**

In Kenya there is a platform called "iSikCure" that provides family planning services using phones. By using the app users can find out about methods, locate nearby clinics for family planning and even book appointments. This initiative has raised awareness, improved access to family planning services giving individuals the ability to make informed decisions, about their reproductive health (Nyongesa et al., 2019).

**Mobile-Based Mental Health Support in Pakistan**

In Pakistan a program called "UMANG" offers health assistance using phones. People can use it to find information, on how to manage stress to deal with depression and anxiety and even receive uplifting messages every day. This initiative has been successful in raising awareness, about health and providing help to those who are going through difficulties (Iqbal et al., 2019).

**Mobile-Based Maternal and Child Health Monitoring in Malawi**

The Chipatala Cha Pa Foni initiative, in Malawi enables community health workers and mothers to obtain child health information through a toll-free hotline. This program offers guidance on topics like pregnancy, caring for newborns and ensuring nutrition for children. It has played a role in enhancing the well-being of both mothers and children by increasing awareness and promoting access (Lori et al., 2012).

**M-TIBA in Kenya**

M-TIBA, an initiative, in Kenya has revolutionized the availability and affordability of healthcare through technology. Developed in partnership with Safaricom, a leading mobile network operator in Kenya and CarePay a company specializing in health financing technology M-TIBA serves as a platform that efficiently manages healthcare expenses and promotes inclusion. Users can easily deposit funds into their M-TIBA wallets, which are exclusively reserved for healthcare related costs. This versatile platform allows users to conveniently pay for

healthcare services like consultations with doctors, prescriptions, diagnostic tests and hospital admissions making healthcare expenses more manageable. By integrating a network of healthcare providers into its system, M-TIBA ensures that users can easily locate and access quality services while promoting transparency in financial transactions within the healthcare sector. Particularly beneficial for populations with access, to traditional banking systems M-TIBA has played a crucial role in improving healthcare outcomes across Kenya (Safaricom, n.d.; CarePay, n.d.).

**RapidSMS in Uganda**

UNICEF has implemented a messaging system known as RapidSMS, which's an open-source platform used in Uganda to improve the collection and reporting of healthcare data. This innovative mobile technology allows healthcare professionals to exchange real time health information via text messages greatly enhancing the efficiency of data transmission, in the healthcare sector. In Uganda RapidSMS has been successfully utilized for healthcare purposes such as monitoring disease outbreaks, tracking vaccine distribution and monitoring child health indicators. By streamlining data collection and reporting procedures RapidSMS has played a role, in facilitating decision making processes improving healthcare services and effectively addressing public health challenges in Uganda (UNICEF Uganda, n.d.).

**FrontlineSMS in Haiti**

FrontlineSMS has been instrumental, in enhancing healthcare in Haiti. Following the earthquake in 2010 FrontlineSMS played a role in coordinating relief operations and disseminating lifesaving information to survivors. Over the years FrontlineSMS has successfully facilitated mHealth initiatives, such as enhancing health monitoring, promoting health education and providing healthcare access, to individuals residing in remote regions (FrontlineSMS, 2023; World Health Organization, 2023).

These examples demonstrate the variety of mHealth initiatives, in developing nations. Each of these initiatives tackles healthcare obstacles and enhances health outcomes, by utilizing mobile technology in innovative ways.

Here are some statistics on the use of mobile-based health applications in developing countries:

- As of 2021, there were over 175,000 mobile health (mHealth) apps available globally, many of which are targeted towards users in developing countries (World Health Organization, 2021).
- In low- and middle-income countries, the adoption of mHealth apps has been growing rapidly, with an estimated 1.7 billion smartphone users as of 2020 (GSMA, 2020).
- A 2019 survey found that 58% of respondents in developing countries reported using a mobile app for health purposes, compared to 33% in developed countries (Poushter & Oates, 2019).
- In India, there were over 100 million users of mHealth apps as of 2021 (Statista, 2021a).

- In India, Popular apps include Practo, 1mg, and Medlife for telemedicine, medicine delivery, and health information (Aithal & Aithal, 2018).
- 40% of Kenyan adults used mobile health services in 2019 (Kos et al., 2020).
- M-TIBA is a popular mobile wallet and health financing platform with over 2 million users in Kenya (M-TIBA, 2020).
- 30% of Nigerians used mobile health services in 2018 (GSMA, 2018).

## CHALLENGES AND BARRIERS

Some of the major challenges and barriers of mHealth in developing countries are described below.

### Limited Infrastructure

In developing nations there exists a lack of electricity and network connectivity, particularly, in rural and distant regions. This poses a challenge to the effective utilization of technology in healthcare (Tomlinson et al. 2013).

### Digital Divide

Access to technology remains unequal in developing countries with marginalized communities facing availability of smartphones and mobile data. This disparity, in access worsens healthcare inequalities (Meurs et al., 2019).

### Data Security and Privacy

There are concerns regarding the security and privacy of health data when it is collected and transmitted through devices. It is of importance to safeguard the confidentiality and integrity of information (Aranda-Jan et al., 2014).

### Regulatory Challenges

In developing countries there might be a lack of defined regulations when it comes to mHealth applications and services. This can create uncertainty regarding the ethical considerations associated with delivering healthcare through technology (Fernandez-Luque & Bau 2015).

### Healthcare Workforce Training

In order to make the most of technology in healthcare it is important for healthcare workers to receive training, on how to use it. Training programs are essential to ensure that healthcare professionals have the skills to effectively utilize the tools (Labrique et al., 2013).

### Sustainability and Funding

Sustainable funding options, for mobile health initiatives are frequently insufficient. Long-term banking and financial support needed in sustaining operations and achieving significant impact (Labrique et al., 2013).

### Cultural and Language Barriers

Mobile health interventions might not take differences into account without accessible in local languages, which could reduce their effectiveness among diverse populations.

### Health Literacy

In cases, among patients residing in rural regions there may be individuals with limited knowledge, about health matters who face challenges when it comes to comprehending and utilizing mobile health apps efficiently.

### Technical Support and Maintenance

Mobile devices and applications often need assistance and upkeep which can pose difficulties, in situations where resources are limited.

### Resistance to Change

Healthcare professionals and individuals seeking care might exhibit reluctance, towards embracing technologies resulting in a gradual uptake and restricted effectiveness.

### Interoperability

It is crucial to ensure communication and data sharing, among mobile health systems, which can become complicated especially when dealing with different platforms and devices.

### Data Accuracy and Reliability

Health information gathered through devices may contain inaccuracies particularly if it is collected by individuals, without healthcare expertise or in areas, with insufficient resources.

## ADVANTAGES AND BENEFITS

Mobile technology has brought benefits and advantages to healthcare in developing nations in areas where access, to traditional healthcare infrastructure is limited. Here are some of these advantages:

### Increased Access to Healthcare Services

Mobile technology plays an important role, in enabling individuals residing in underserved regions to conveniently access healthcare information, seek consultations and avail of essential services. It effectively bridges the divide, between healthcare providers and patients (Labrique et al., 2013).

### Telemedicine and Remote Consultations

Telemedicine has become increasingly popular, with the rise of apps and platforms. It offers patients the convenience of consulting with healthcare professionals which's particularly beneficial, for managing chronic conditions and follow up care (Mars and Scott 2016).

### Health Information Dissemination

Mobile applications and SMS are widely utilized to distribute health related information, including tips on preventing diseases, reminders for taking medications and schedules for vaccinations. This greatly contributes to raising awareness about health issues (Free et al., 2013b).

### Data Collection and Management

Mobile technology enables the real time collection of healthcare data, which enhances disease surveillance, helps monitor outbreaks and supports decision making based on evidence (Labrique et al., 2013).

### Point-of-Care Diagnostics

Mobile devices have the capability to be equipped with tools transforming smartphones into laboratories. This plays a role in facilitating disease diagnosis and early intervention (Pai et al., 2012).

### Health Worker Training

Mobile platforms provide training modules and resources to enhance the skills and knowledge of healthcare professionals those working in rural areas (Agarwal et al., 2015).

### Supply Chain Management

Mobile technology is effective in monitoring and overseeing the supply chain of medications and vaccines guaranteeing their accessibility even in remote regions (Larson et al., 2016).

### Behaviour Change Communication

Mobile applications and text message campaigns are utilized to promote behaviour modifications specifically focusing on promoting habits such as family planning, maternal and child health, and nutrition (Free et al. 2013b).

### Cost Reduction

Mobile health interventions are frequently found to be economically viable alleviating the strain on healthcare systems and individuals (Mars and Scott 2016).

### Research and Data Analytics

Healthcare data generated through mobile devices can be utilized for research and epidemiological studies contributing to the comprehension of disease patterns (Pai et al., 2012).

### Empowering Patients

Mobile technology has provided patients with the ability to access their health records and play a role in making decisions, about their healthcare (Labrique et al., 2013).

### Emergency Response and Disaster Management

Mobile devices play a role, in emergency situations by facilitating communication, coordination and allocation of resources during times of disasters and crises (Agarwal et al., 2015).

## OPPORTUNITIES AND FUTURE DIRECTIONS

Mobile technology has opened up a world of possibilities in healthcare in developing countries. There are opportunities and exciting prospects, for the future that we can explore. Here are some of them:

### Telehealth Expansion

The use of technology to extend telehealth services presents an opportunity to enhance healthcare access, in underserved regions. This can result in availability of consultations and specialized care for individuals residing in these areas. Looking ahead it is crucial to expand the telehealth infrastructure and services so that they can reach a vast number of populations. Additionally there should be an expansion, in the variety of services offered through telehealth. This way more people will benefit from healthcare regardless of their location (ITU, 2020).

### Mobile Health Records and Data Management

The use of mobile health records and data management systems has the potential to enhance healthcare coordination to facilitate the sharing of information and improve decision making among healthcare providers. A promising approach involves integrating mobile health records into health information systems while prioritizing interoperability, data security and privacy enhancement (Labrique et al., 2013).

### Remote Monitoring of Chronic Conditions

Mobile technology presents an opportunity for the real time monitoring of conditions, like diabetes and hypertension enabling patients and healthcare providers to effectively manage these health issues. Looking ahead there is a direction towards the development of devices and sensors that allow for continuous health monitoring as well as the expansion of remote monitoring programs (Kumar et al., 2017).

### Health Education and Behaviour Change

Mobile apps and text messaging services have the potential to enhance health education, prevent diseases and encourage changes, within communities. A promising approach is to customize health education materials according to language requirements while utilizing artificial intelligence, for personalized health recommendations (Free et al., 2013a).

### Mobile-Based Maternal and Child Health

Mobile technology has the potential to enhance child health in many ways. It can provide access, to information, on prenatal care, vaccination schedules and monitoring the growth of children. Looking ahead there is a need to strengthen existing child health programs by incorporating interventions and providing additional support from community health workers (Lund et al., 2012).

### Mobile-Based Diagnostics and Point-of-Care Testing

Mobile technology presents an opportunity to accelerate the process of diagnosing and conducting tests, for diseases thereby aiding in detection and treatment. Looking ahead it is essential to focus on the development of devices that can be easily accessed in remote areas (Drain et al., 2014).

### Mobile-Based Vaccine Distribution and Tracking

Mobile technology presents an opportunity to enhance the distribution and monitoring of vaccines thereby ensuring their accessibility to marginalized and remote communities. To

achieve this we can consider implementing vaccine tracking systems through applications and employing SMS notifications as reminders, for individuals regarding vaccination schedules (Githinji & Noor 2016).

**Mobile-Based Drug Supply Chain Management**

There is a potential for technology to improve the management of drug supply chains ensuring that essential medications are always available and reducing instances of stockouts. Moving forward it would be beneficial to introduce mobile based systems, for managing drug inventory and incorporating technology to enhance transparency (Bhattacharya et al., 2017).

**Mobile-Based Mental Health Support and Teletherapy**

There is a chance to tackle the increasing health issues, in developing nations by expanding the availability of mobile based health services. These services can include teletherapy and various forms of support. Looking ahead it would be beneficial to focus on the development of mental health apps and provide training for mental health professionals, in teletherapy (Kuhn et al., 2014).

**Mobile-Based Maternal Mortality Reduction**

Mobile technology has the potential to play a role, in lowering maternal mortality rates by granting women access to emergency services, health related information and transportation. To move forward it is essential to focus on broadening the availability of mobile based emergency response systems, for health while simultaneously enhancing transportation networks (Abimbola et al., 2016).

**Mobile-Based Health Insurance Enrollment**

The use of technology has the potential to make health insurance enrollment and premium payments easier, which can help extend coverage to populations that currently have access. It would be beneficial to focus on promoting health insurance schemes that are based on platforms and improving peoples understanding of healthcare financing. This can contribute to literacy in the healthcare sector (Kutzin et al., 2016).

**Mobile-Based Research and Surveillance**

Mobile technology plays a role in advancing research and disease surveillance by enabling early detection and prompt response to disease outbreaks. Moving forward it is essential to focus on enhancing mobile based research networks and developing the capability, for real time data analysis (Wesolowski et al., 2016).

The possibilities and future paths emphasize the impact that mobile technology can have on healthcare in developing nations. It opens up avenues for access to healthcare, delivery of services and overall health outcomes.

## CONCLUSION

Mobile technology offers a ray of hope in the field of healthcare delivery, in developing countries. Its ability to bridge gaps in access improve healthcare outcomes and enhance service quality is truly remarkable. As we have explored, mobile technology opens up opportunities such as expanding telehealth services enhancing health tracking and vaccination efforts and providing health support. Despite facing challenges like infrastructure and regulations, the future of healthcare technology in developing nations looks promising. By collaborating with governments, healthcare providers, tech innovators and global organizations and working together diligently we can unlock the potential of technology to create fairer, patient centered healthcare systems. It is our responsibility as technology continues to advance to ensure that these innovations benefit underserved communities and ultimately lead to improved well-being and brighter futures for individuals in developing countries. Mobile technology is not a tool; it serves as a catalyst for change, in healthcare that empowers nations to achieve health outcomes for their citizens.

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# EVOLUTION OF THE NASHVILLE HEALTHCARE INDUSTRY CLUSTER

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## ABSTRACT

*While healthcare services have driven the development of different sectors of industry clusters, little attention has been paid to healthcare services as an industry cluster. This study analyzes the healthcare industry's evolution in the Nashville Metropolitan Statistical Area (MSA) through the framework of an industry cluster. The cluster evolution is evaluated by analyzing the presence of clustering antecedents and the regional economic benefits through economic data collected from 2004 through 2022.*

*Clustering antecedents are found in the Nashville healthcare industry (critical companies tied to each other economically surrounded by competing and cooperating companies, local research organizations, university-supported specialized and non-specialized labor pools, an entrepreneurial funding environment, and a commitment by either a local government or industry champion). We conclude that the healthcare industry in the Nashville MSA qualifies as a cluster and has provided increasing economic benefits to the region over the last 18 years.*

*The healthcare cluster has contributed significant jobs, business revenue, personal income, and state/local taxes to the regional economy, which has only grown over the study period. The number of healthcare establishments has doubled, providing an 80% increase in direct employment within the sector. Direct generated personal income improved by 106% from 2004 inflation-adjusted dollars, and business revenue injected into the regional economy increased to $36.8 billion, representing a 98% increase from 2004 inflation-adjusted dollars.*

*Industry clusters generally require a catalyst to form and sustain. In the case of the Nashville Healthcare Industry Cluster, uncharacteristically, the catalyst has not been a government entity but a local membership trade association serving as an industry champion (The Nashville Health Care Council - NHCC). The NHCC has supplemented the typical governmental role in developing industry clusters (e.g., government infrastructure development for logistics clusters) and has been a driving force facilitating networking, collaboration, and development, contributing to a self-sustaining entrepreneurial environment supported by venture capital and local universities providing specialized and nonspecialized labor forces.*

*This study identifies the Nashville MSA Healthcare Industry as an industry cluster that has provided significant benefits to the regional economy over the last 18 years. It also identifies the NHCC as the driving force behind developing an environment conducive to industry clustering. The success of the Nashville Healthcare Industry Cluster is supported by at least two other regional areas replicating the model with a Health Care Council organization.*

## INTRODUCTION

Industry clusters have been researched since 1920, when Alfred Mitchell analyzed three conditions conducive to cluster development (Mitchell, 1920). The three criteria identified by Mitchell are labor availability, the existence of specialized suppliers, and the possibility of external "spillovers" (knowledge sharing). Since 1920, there has been much research to refine the cluster definition and provide causes and incubating factors in which industry clusters develop (Isbasoiu, 2006).

Healthcare services have been viewed as a driver of forming and sustaining nonhealthcare industry clusters as a realized benefit in improving community health for the sizeable supporting workforce required. However, healthcare services as clusters have received less attention in the literature, yet there is evidence that various industry participants across multiple verticals can cluster, assuming a driving and instigating force exists. One such example is the healthcare industry in the Nashville Metropolitan Statistical Area (MSA). The Nashville MSA is home to more than 46 major public and private healthcare companies. In addition, seven of the nation's 15 leading for-profit acute care hospitals and nursing management companies, accounting for approximately 34 percent of the investor-owned hospitals in the United States, are headquartered within the Nashville MSA (Arik and Devi, 2023).

In this study, we seek to analyze the locating of companies from various healthcare verticals within the Nashville MSA in the last 18 years, forming a significant healthcare cluster. We analyze the cluster through the lens of industry cluster development criteria, demonstrating that while less structured than examples of other industry clusters (logistics, biopharmaceutical, financial, or medical device), the healthcare environment within the Nashville MSA qualifies as a cluster driven by a local membership association, The Nashville Health Care Council (NHCC), generating a considerable impact on the local and regional economy and the associated industry environment.

The paper is structured as follows. The next section discusses existing literature concerning industry cluster criteria and what makes an industry cluster, forming the basis of our analysis of the healthcare industry in the Nashville MSA. We then discuss the methodology and data used in the study, resulting in our findings. Finally, we present our conclusions and discuss the implications and limitations of this study.

## LITERATURE REVIEW

The review of selected literature concerning industry clusters provides several defining criteria. Porter (1998) defined clusters as "geographically proximate groups of companies and associated institutions in a particular field, linked by commonalities and complementarities." Subsequently, cluster definitions have been refined to include geographic and spatial clustering of economic activity, relationships between industry sectors, the presence of a central actor, cooperation, competition, and the role of social interaction (Jacobs and De Long, 1996). Rivera, Gligor, and Sheffi (2016) define industrial clusters as "groups of interrelated firms that cooperate and compete to create wealth within a certain geographical area." Essentially, clusters need a

critical mass of firms located in geographic proximity that are economically tied to each other along with significant financial resources for investment.

There is no agreement concerning a general theory or law of how clusters form (Isbasoiu, 2006). The conditions vary depending on the cluster's type, industry, and geography. However, some criteria have been discussed in the relevant literature. For example, Wolfe & Gertler (2004) propose that clusters can form around one or two critical firms that attract other companies over time. Clusters can also form due to public sector investment, such as research-intensive universities for knowledge-based industries or substantial infrastructure investment for logistics clusters. Another driving factor can be a strong commitment by either local government or an industry champion to provide "leadership, the vision, and the wear-with-all to make industry clusters happen" (Roberts, 1998).

Hallock, Thai, Peszynski, and Chhetri (2018) provided a literature review of the benefits of industry clusters that provide insight into cluster requirements. These authors discussed labor (availability of specialized and non-specialized labor, knowledge spillovers, and technology spillovers) and location or spatial (proximity, collaboration, and networking) as key cluster benefits. Realizing these benefits requires a strong specialized and non-specialized labor pool and an environment that helps initiate and support collaboration and communication opportunities to facilitate knowledge sharing.

While clusters provide regional economic benefits, they can also improve technological and operational innovation resulting from knowledge spillover (Cui, Wang, Xu, & Li, 2022). Various types of organizations, such as government agencies, research institutes, trade organizations, companies, and universities, can contribute to the relationship between regional development and the creation of innovative performance in industry clusters (Kim, Hwang, & Yoon, 2023). Clusters can provide mechanisms for sharing tacit knowledge or knowledge, skills, and abilities learned through experience. This knowledge-sharing occurs as employees shift between cluster members and move into the economic region from other areas (Cooke, 2002). The tacit knowledge-rich environment can also drive companies to locate within a cluster to gain or prevent the loss of such knowledge by retaining access to skilled workers and competencies (Sammarra and Belussi, 2006). Therefore, clusters can attract a highly skilled and knowledgeable workforce that attracts more companies that rely on these skills, further growing the cluster in a self-feeding cycle.

## METHODOLOGY AND DATA

Our analysis is based on data collected for 2004, 2008, 2014, and 2022 concerning the healthcare industry in the Nashville MSA. The relevant objectives of this study are the analysis of industry cluster characteristics and the trends, scope, and impact of the healthcare industry cluster on the regional economy, the economic significance to the region of healthcare companies headquartered in Nashville, and the role of the Nashville Health Care Council in promoting the healthcare industry in the Nashville MSA.

The healthcare cluster includes core healthcare providers that provide services directly to healthcare consumers, such as

- Ambulatory Services
- Hospitals
- Nursing Care Facilities
- Physicians

Peripheral healthcare suppliers and supporting companies include related healthcare industries, such as management companies and biomedical research entities providing services to core healthcare providers or the specialized and nonspecialized workforce, such as

- Healthcare Management Organizations
- Consulting Organizations
- Colleges and Universities
- Research Organizations
- Public Health Organziations
- Medical Insurance
- Healthcare Manufacturing and Wholesalers,
- Pharmacies
- Drug Stores
- Ophthalmic Goods

These entities have a direct impact on the economy through employment (total number of full-time employees), personal income (total reported pre-tax payroll), and business sales (total spending of the healthcare cluster to purchase goods and services in the associated economy). There is also an indirect impact referring to employment, business sales, or income generated by the interaction of local businesses with the healthcare industry cluster and by suppliers via business-to-business transactions. For example, a hospital purchases goods and services from local businesses for its operation. This hospital's spending in the local economy means additional jobs, business revenues, and personal income in other sectors. Induced impact refers to the employment, sales, and personal income generated in the local economy by employee spending (Arik and Devi, 2023).

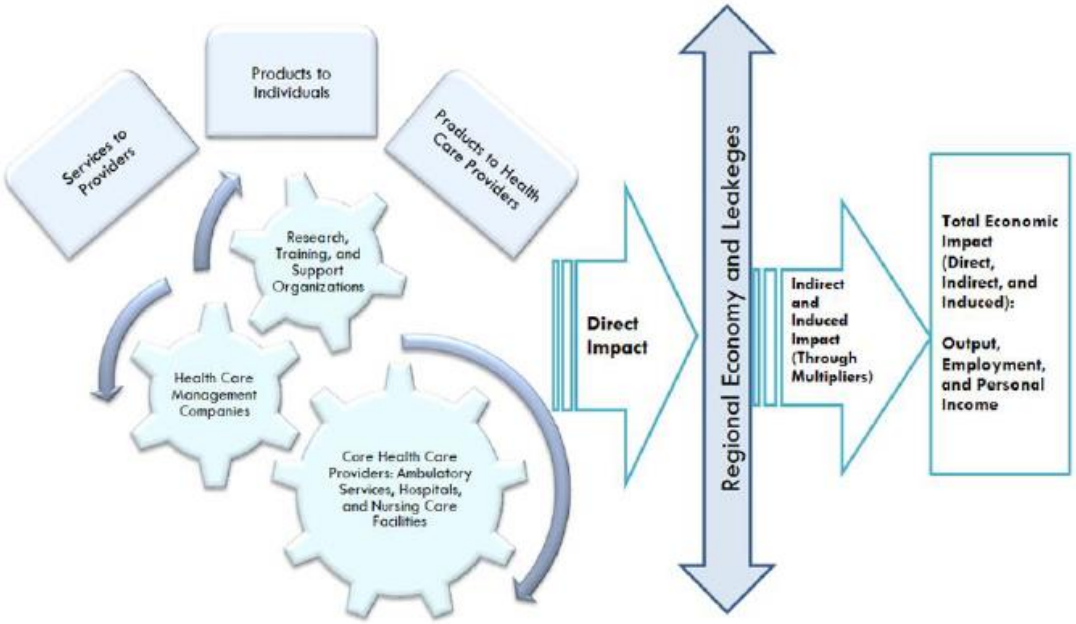
The data used in this study to understand economic impact was collected from multiple sources and used to construct a time-series perspective on healthcare indicators, as detailed in the Appendix of Arik and Devi (2023). Additional data was collected from an NHCC member survey targeting 252 Nashville MSA organization members to understand the impact of the NHCC. The survey included company profile, company operations, and Nashville Health Care Council Impact. One hundred twenty-eight companies accessed the survey, but only 60 responses were usable, representing a response rate of 23.8 percent.

One way to quantify the economic impact of the cluster is to use a counterfactual approach, which removes the whole healthcare industry cluster from the economy and then measures the economic impact of the subtraction on the economy. The conceptual framework of how the cluster impacts the economy is included in Figure 1.

IMPLAN impact modeling software (a predictive model based on regional accounting matrices) was used to measure the impact of the core and peripheral. The IMPLAN model considered the direct employment, business sales, and income generated by the healthcare industry cluster and the additional or secondary impacts of all economic activity related to such

employment and business sales. The indirect and induced effects of the healthcare subsectors were adjusted on each other within the healthcare industry cluster. The study assumed that IMPLAN regional purchasing coefficients (RPCs) represent the current situation, and the differences between 100 percent local purchase and the default model RPCs determine the leakages outside of Nashville. To avoid double-counting, the core healthcare providers were not allowed to stimulate the cluster's healthcare sector and other subsectors.

**Figure 1: Conceptual Framework for Impact Analysis**




**S**ource: Authors

## RESULTS

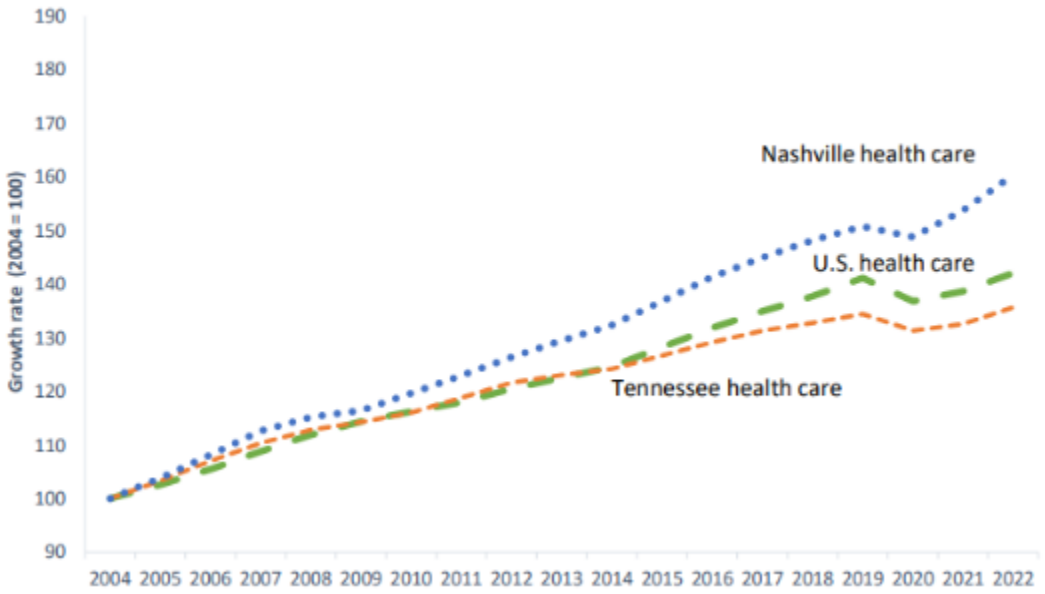
The Nashville MSA healthcare industry has grown significantly over the last 18 years, including companies, employment, and economic impact (refer to Table 1). This growth is significant to study because it has outpaced both Tennessee and national industry growth. One such example (Figure 2) is employment growth, which has outpaced both the Tennessee and national growth rates (Arik and Devi, 2023). Many factors contribute to this growth, including business climate, available venture capital, adequate labor supply, and other opportunities.

**Table 1**
**Nashville MSA Healthcare Cluster Companies, Employment, & Economic Impact (Summary)**

| Year | Nashville-Based Healthcare Establishments | Industry Cluster Direct Employment (# of Jobs) | Industry Cluster Generated Personal Income (inflation-adjusted to 2022 $ Billions) | Industry Cluster Direct, Business Revenue Injected into Economy (inflation-adjusted to 2022 $ Billions) |
|---|---|---|---|---|
| **2004** | 2,237 | 94,346 | $9.8 | $18.6 |
| **2008** | 2,703 | 113,453 | $8.2 | $23.1 |
| **2014** | 4,027 | 125,918 | $19.7 | $28.6 |
| **2022** | 4,755 | 170,702 | $20.3 | $36.8 |

Source: Arik and Penn, 2006; Arik, 2010; Arik, 2015; Arik and Devi, 2023

**Figure 2: Healthcare Employment Growth Trend: Nashville versus the U.S. and Tennessee U.S. and Tennessee**




Source: Arik and Devi, 2023

## Nashville MSA Healthcare Industry as a Cluster

The Nashville MSA healthcare industry supports a cluster definition based on multiple criteria, such as critical companies tied to each other economically surrounded by competing and

cooperating companies supporting various components of the industry; research organizations and university-supported specialized and non-specialized labor pools; an entrepreneurial and robust funding environment; and a commitment by either a local government or an industry champion. (Arik and Devi, 2023). Nashville-based healthcare establishments have increased by 113% to 4,755 in 2022, demonstrating a clear trend toward company attraction to the cluster. In 2022, 17 publicly traded healthcare companies were headquartered in Nashville, and 46 major Nashville-based public and private investor-owned healthcare management companies. These companies represented a global reach across the healthcare industry.

**Physical Clustering Linked by Commonalities and Complementarities**

The initial impetus for the cluster dates back to the 1960s, with the location of three critical hospital companies in the Nashville area: Hospital Corporation of America (HCA), Hospital Affiliates International (HAI), and General Care Corporation. Each of these companies subsequently instigated hundreds of spinoffs, new companies, mergers, and acquisitions into all aspects of the healthcare industry (A History of Healthcare in Nashville, 2015), evolving into the existing complex network of healthcare cluster companies.

The strong network of healthcare companies and expertise now serves as a strong attractor to new competing, supporting, and complimentary entrants into the cluster. For example, the Center for Medical Interoperability opened its headquarters in Nashville in 2017. The center is a cooperative research and development lab founded by health systems to simplify and advance data sharing among medical technologies and systems. The main criterion for the center's location in Nashville was the proximity to major health systems (Landi, 2018).

**Entrepreneurial Environment**

The Nashville MSA is home to a robust entrepreneurial environment supporting industry innovation. Starting in the 1960s with the founding of one of the first multi-hospital systems (HCA) to the invention of the ambulatory surgery model credited to Surgical Care Associates (SCA) formed in 1985, the Nashville market has been a leader in healthcare innovation. Much of this entrepreneurial activity can be explained through the social/work network in the Nashville healthcare business community (Carr, Topping, Woodard, & Burcham, 2004). These authors show how an entrepreneur who enters a network establishes contact with multiple nodes (people and companies), providing additional information and lowering transaction costs. The increased entrepreneurial activity leads to more nodes and entrepreneurial activity; "healthcare entrepreneurship creates more healthcare entrepreneurship" (Carr et al., 2004). A strong venture capital fund structure underpins the entrepreneurial environment, contributing over $370 million in 2022, representing just over 26% of all venture capital activity in the region (Arik and Devi, 2023).

## Labor and Public Sector Investment

The Nashville MSA supports the specialized and non-specialized labor supply with two private medical-focused universities, three public universities, four private universities, and an extensive network of smaller private colleges and public community colleges. The three public universities awarded over 8,100 Bachelor's and Master's degrees in the 2019-2020 academic year. (THEC, 2021), and the four private universities awarded just over 7,300 Bachelor's and Master's degrees in 2021. The largest private university is Vanderbilt, a major research and teaching hospital. Additionally, the University of Tennessee and Memphis University are just outside the MSA and supply the healthcare industry labor force.

## Industry Champion

The Nashville Health Care Council (NHCC) is an industry association comprising over 300 member organizations catalyzing leadership and innovation (NHCC, 2023; Landi, 2018). This organization is the driving force facilitating networking and collaboration within the healthcare cluster. The NHCC supports leadership with two programs (Fellows Program and Leadership Health Care). The Fellows Program provides a customized curriculum for existing leaders to learn from peers leading top healthcare organizations of all sizes and geographies nationwide (NHCC, 2023). The Leadership Health Care program "provides members unique educational programs and networking opportunities." The initiative has a membership of more than 500 up-and-coming healthcare industry leaders from hundreds of organizations (NHCC, 2023). The organization provides additional collaboration and networking activities with various events throughout the year. The organization has achieved high levels of success and has served as a model for the Austin Healthcare Council and the Health Care Council of Chicago (Landi, 2018).

The NHCC member survey highlighted the impact of the organization on the cluster. Responding company CEOs indicated 25 ways the NHCC contributes to the entrepreneurial environment in the Nashville MSA. Of the responses, the six most common were networking, connecting players from all sides of the industry: connectivity is related to networking but is highly emphasized in the comments, collaboration, events organized by the Council, training-from the fellows program to other educational activities, and development of educational materials and resources for opportunities and challenges.

Members were also asked to provide three words to describe the contribution the Nashville Health Care Council makes to the growth of the healthcare industry in the Nashville MSA. The top six of the more than 50 distinct responses included collaboration, network, leadership, education, innovation, and connections. The survey responses provide evidence that the NHCC serves as a driving force in facilitating networking and knowledge sharing across the different sectors of the healthcare cluster in this region. While local government participates in cluster development through typical business attraction and retention activities, the NHCC is a key factor contributing to cluster growth.

## Nashville MSA Healthcare Cluster Impact on the Regional Economy

This study found multiple indications of the positive impact of the Nashville MSA healthcare cluster on the regional economy. The impact has grown substantially. Employment is a critical factor for clusters. Healthcare clusters depend on a strong labor market to provide for specialized (medical, patient care, etc.) and non-specialized job roles (support, administration, etc.). Additionally, a critical mass of companies and employees is required to realize the "spillover" effect of knowledge sharing and innovation. The Nashville MSA healthcare cluster has experienced significant employment growth (Just over 80% in direct employment and 115% in direct, indirect, and induced employment).

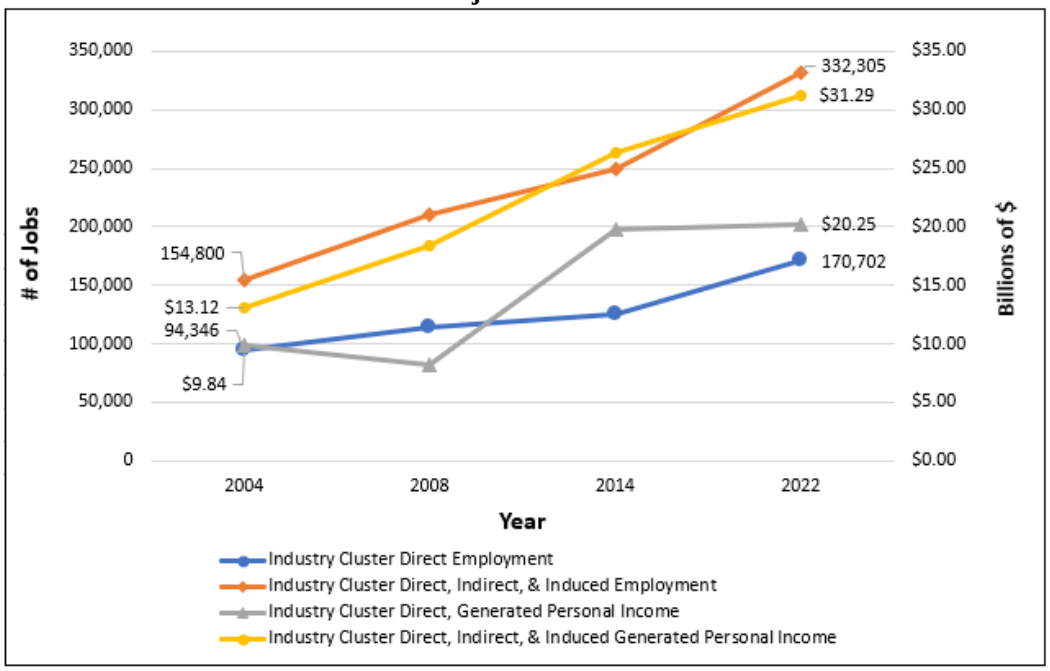
The cluster has also contributed significantly to personal income in the Nashville MSA. Direct personal income generated by the cluster adjusted for inflation to 2022 dollars has grown by nearly 106% from 2004 to 2022 to $20.25 billion (refer to Table 2 and Figure 3), representing 23% of the total personal income in the Nashville MSA.

**Table 2**
**Nashville MSA Healthcare Cluster Employment and Generated Personal Income**

| Year | Industry Cluster Direct Employment (# of Jobs) | Industry Cluster Direct, Indirect, & Induced Employment (# of Jobs) | Industry Cluster Direct, Generated Personal Income (inflation-adjusted to 2022 $ Billions) | Industry Cluster Direct, Indirect, & Induced Generated Personal Income (inflation-adjusted to 2022 $ Billions) | Percent of the Nashville MSA's total personal income |
|---|---|---|---|---|---|
| **2004** | 94,346 | 154,800 | $9.8 | $13.1 | 18% |
| **2008** | 113,453 | 211,059 | $8.2 | $18.4 | 22% |
| **2014** | 125,918 | 249,345 | $19.7 | $26.3 | 26% |
| **2022** | 170,702 | 332,305 | $20.3 | $31.3 | 23% |

Source: Arik and Penn, 2006; Arik, 2010; Arik, 2015; Arik and Devi, 2023

**Figure 3: Nashville MSA Healthcare Cluster Employment and Generated Personal Income Inflation Adjusted to 2022 Dollars**




Source: Arik and Penn, 2006; Arik, 2010; Arik, 2015; Arik and Devi, 2023

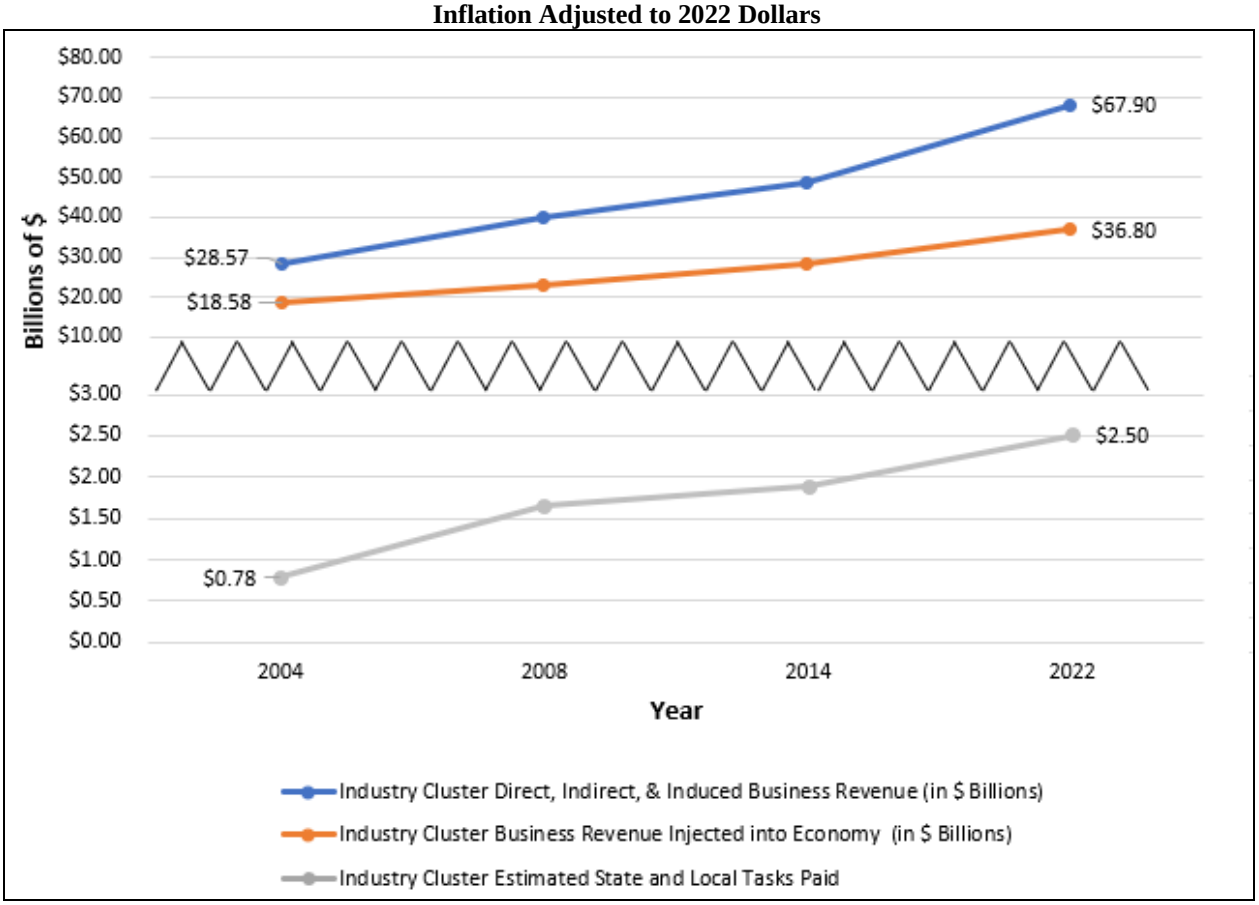
Turning to the economic impact on the surrounding region, we also find significant evidence of growth. The cluster generated over $67 billion of business revenue in 2022, representing a 138% increase over 2004 (inflation-adjusted to 2022 dollars). The cluster has also contributed over $2.50 billion in state and local tax revenue in 2022. Total direct, indirect, and induced business revenue grew from $28.57 billion in 2004 (inflation-adjusted to 2022 dollars) to $67.90 billion in 2022 (refer to Table 3 and Figure 4).

**Table 3**
**Nashville MSA Healthcare Cluster Economic Impact**

| Year | Industry Cluster Direct, Indirect, & Induced Business Revenue (inflation-adjusted to 2022 $ Billions) | Industry Cluster Business Revenue Injected into the Economy (inflation-adjusted to 2022 $ Billions) | Industry Cluster Estimated State and Local Tasks Paid (inflation-adjusted to 2022 $ Billions) |
|---|---|---|---|
| **2004** | $28.6 | $18.6 | $0.8 |
| **2008** | $40.1 | $23.1 | $1.7 |
| **2014** | $48.6 | $28.6 | $1.9 |
| **2022** | $67.9 | $36.8 | $2.5 |

Source: BERC Health Care Industry Nashville MSA Analysis, 2005, 2010, 2015, and 2023

**Figure 4: Nashville MSA Healthcare Cluster Economic Impact**
**Inflation Adjusted to 2022 Dollars**




Source: BERC Health Care Industry Nashville MSA Analysis, 2005, 2010, 2015, and 2023

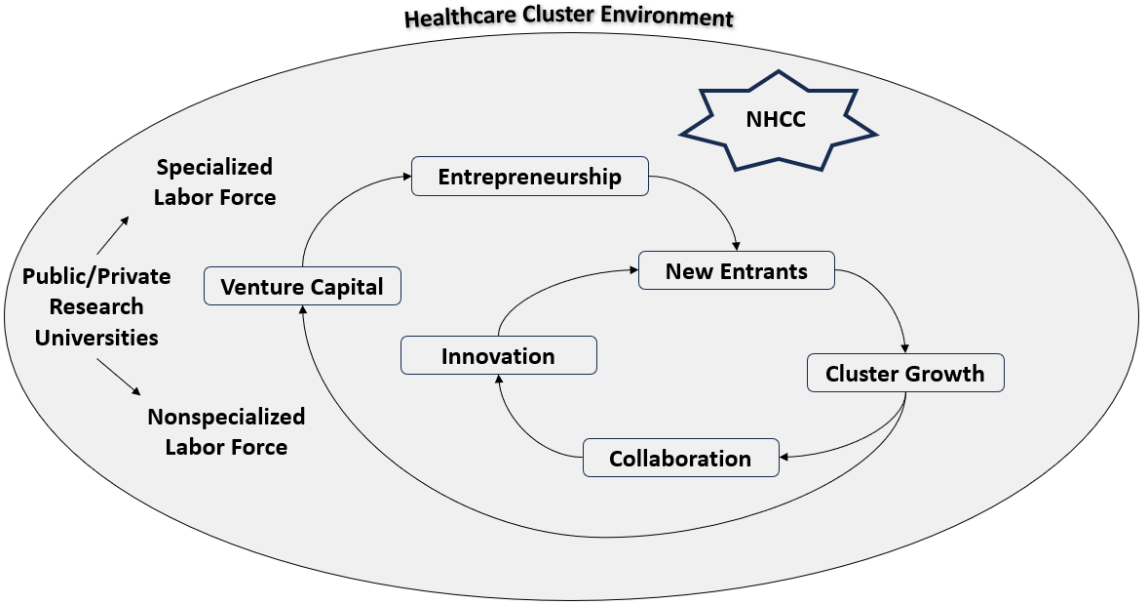
## IMPLICATIONS AND LIMITATIONS

Industry clusters are important to a region's economic growth and participating companies' associated performance. The Nashville MSA healthcare cluster fosters collaboration and innovation, attracting new entrants. Actual and potential growth, in turn, attracts venture capital that contributes to a robust entrepreneurship environment, further attracting new entrants. The NHCC serves as the conduit and catalyst through actions and programs that cultivate knowledge/technology sharing, collaboration, and networking as part of the cluster environment, adding to public and private university support of the specialized and nonspecialized labor force (refer to Figure 5, illustrating the components of the cluster environment). These components combine to contribute to the growth and sustainability of the healthcare cluster.

The positive historical impact of the Nashville MSA healthcare cluster on the regional economy implies that sustained performance and growth of the cluster contribute significantly to the development of the surrounding economy. As the cluster grows, so will the impact of expanding employment, personal income, and tax revenues. As discussed above, successful

entrepreneurship results in more entrepreneurship. Likewise, the knowledge sharing through company communication and collaboration fostered by the cluster industry champion, in this case, the NHCC, grows the innovation-rich culture, resulting in more companies desiring to locate within the cluster. In the end, a self-sustaining cycle of growth is established.

**Figure 5: Nashville Healthcare Cluster Environment**




The implications are significant for regions with a high presence of healthcare industry companies. Colocation and collaboration can grow organically, but the NHCC provides an example of how growth can be fostered by focusing on the critical characteristics of industry clusters, specifically collaboration and networking.

In exploring the Nashville MSA healthcare cluster, this paper did not analyze other potential healthcare clusters following the same path. Further research can review the development of the healthcare industry in Austin and Chicago to evaluate the impact of similar industry champion organizations, comparing these regions to Nashville's success. In this manner, the model can be validated and serve as a roadmap for future potential healthcare clusters.

## CONCLUSIONS

Healthcare clusters are less researched than other industry clusters, but their impact on regional economies and healthcare services is significant. This study shows the evolution of the economic impact of the healthcare cluster on the Nashville MSA economy through the growth of jobs, personal income, business revenue, and state and local tax contributions to local governments. Our contribution to existing knowledge is identifying the NHCC's role in developing and supporting an environment conducive to cluster growth and sustainability. Other industry clusters, such as logistics clusters, rely extensively on local and state government

funding for infrastructure and other environmental development. While supported by local and state governments through favorable incentives, Nashville's healthcare cluster success is more strongly driven by a robust industry organization dedicated to the service of its participating members.

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# UNLEASHING CLOUD POTENTIAL: A COMPREHENSIVE EXPLORATION

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**Muhammed Miah, Tennessee State University**

## ABSTRACT

*Traditional on-premise computing is giving way to a transformative era, the Cloud computing era, where organizations are increasingly embracing cloud-based solutions to gain a strategic edge. By outsourcing computing needs to providers like Amazon Web Services and Microsoft Azure, organizations unlock agility and refocus resources on core business and customer-centric endeavors. Cloud computing's various models allow optimal cost efficiency and computational scalability without the burden of hardware and software management. Beyond organizational benefits, cloud computing democratizes access to computing resources, as smaller organizations can empower developers to launch global apps, researchers gain unprecedented data analysis capabilities, and end-users access abundant software and storage for digital media.*

*The paper provides a comprehensive understanding of cloud computing, encompassing its nature, delivery and deployment models. It explores applications, assesses advantages and disadvantages, describes case studies, analyzes major vendor, associated costs, and finally speculates on future trends. In summary, this article illuminates the transformative role of cloud computing in reshaping organizational paradigms and fostering information technology accessibility across diverse organizations.*

## INTRODUCTION

Organizations are rapidly turning to Cloud based computing solutions, as it is becoming clear that it is a strategic advantage, and freeing up the organizational resources to focus on their core business and their customers. Cloud computing allows organizations to essentially outsource their computing needs to a cloud provider such as Amazon Web Services and Microsoft Azure. Cloud computing enables its customers to use computing resources as a service, and pay only for what is used. By leveraging cloud computing, organizations hope to optimize costs, and increase their computational capabilities, without having to purchase and manage the necessary hardware and software.

Cloud computing also democratizes access to computing resources. For example, software developers in small organizations are empowered to launch globally available apps and online services – something that would have been highly unaffordable if they had to purchase and own massive computing resources. Similarly, researchers with low or moderate resources can share and analyze data at scales once possible only for researchers with access to deep

pockets. Finally, end-users in society can quickly access software and storage to make, share, and store digital media in quantities that reach far beyond the computing capacity of their personal devices.

Cloud computing is essentially the technology that allows computing resources to be utilized as a service, as opposed to traditional "ownership model" of those resources. The National Institute of Standards and Technology defines cloud computing as "a model for enabling ubiquitous, convenient, on-demand network access to a cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction." [Bohn 2020].

Cloud computing vendors like Amazon Web Services and Microsoft Azure allow users to select the service configurations that they currently need, and only pay for those; hence providing a customized and cost-effective solution from a large menu of available configurations. The Cloud vendor then "provisions" the customer's requested configuration. The Cloud customer also has the ability to rapidly change their configurations on-demand, and add on or release computing resources depending on their own current needs. In addition, the Cloud customer can also customize the configuration to their own specific needs, especially if the provisioned configuration has to work with their own existing legacy systems, while also requiring minimal regular management. We next discuss the various cloud computing delivery models.

The primary purpose of this paper is to provide a comprehensive understanding of the cloud computing environment and is organized as follows. We start by describing the various Cloud delivery and deployment models. The paper then investigates and identifies the major advantages and disadvantages of cloud computing. We then present some cloud computing case studies and present the major cloud service vendors and their cost structures. The paper then discusses some future trends in cloud computing and ends with a summary.

## CLOUD COMPUTING DELIVERY AND DEPLOYMENT MODELS

### Cloud Computing Delivery Models

Cloud Computing is often delivered using three delivery models: Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS) [Glass 2020]. Some vendors like Microsoft Azure and AWS are able to deliver all types of delivery models, while some only deliver a single type. The SaaS delivery model allows end-customers to skip the process of purchasing, installing and maintaining software on premises, and allows the use of software on a "pay-for-use" basis. For example, customers can subscribe to Microsoft Office 365, and pay a monthly charge for using the Office software as a service. Other examples are Netflix, in which, video streaming is the subscribed service or Dropbox, where storage is the subscribed service. SaaS is often implemented as a multi-tenant system. where all the users use a single version of the software. Many SaaS based products are user friendly and can be used from web browsers or SmartPhone Apps.

PaaS deployment allows the customer to host its own applications on a Cloud vendor's platform without getting involved with the background hardware and software resources needed to run the application. Unlike SaaS, PaaS users need software developers to develop and maintain their own application and data, but not worry about provisioning to the end users. The PaaS vendor provides a robust hardware and software platform for developing, controlling versions, testing, running, and hosting applications. The in-house software developers can just focus on the application development aspects, using the PaaS provided services, to meet the needs of their end users – thus making it cheaper and faster for the developers.

The PaaS market is growing rapidly at a CAGR of about 13%, [Kanade 2022] and is expected to be about $176 billion in 2024 [Vailshery 2024]. Examples of PaaS providers are Microsoft Azure App Services, Amazon Web Services (AWS) Elastic Beanstalk, Google App Engine, SAP Cloud and Salesforce Lightning. PaaS platforms are well suited for the modern organizational environment, where application development and deployment need to be rapidly adapt to changing conditions and user expectations. PaaS customers are usually enterprises, but can be individuals too. An interesting example of a PaaS use case is GitHub Copilot (GC), which is a cloud-based AI-based code writing service, and they market it as "your AI pair programmer." GC is based on OpenAI's Codex, and is able to suggest code and entire functions in real time. The GC PaaS is hosted on Microsoft Azure, and is priced at just $100/year for individuals, and $19.99 per user per month for businesses. GC for individuals was launched only in June 2022, and at that time 27% of developers' code files on average were generated by GitHub Copilot, while in Feb 2023, that number rises to 46% across all programming languages. For Java, that number in 2023 was a whopping 61% [Zhao 2023]. Developer productivity has clearly shot up rapidly with the GC PaaS.

An IaaS delivery cloud platform, as its name suggests, is the on-demand provisioning of computing infrastructure for its customers, which are also typically enterprises, including research organizations. IaaS allows the users to have a lot more control (and hence also needs more in-house technological work), and essentially expects the IaaS provider server farms to create Virtual Machines (VMs) for the users. The VMs are housed by the IaaS vendor, and all aspects of servers, hard drives, networks, and load balancing are handled by them. The user still has the responsibility of choosing the Operating System and developing application software, but is able to quickly provision, deploy and scale the applications due to the IaaS vendor services. Amazon Web Services, Rackspace, Digital Ocean, Google Cloud Platform, and Alibaba Cloud are examples of IaaS vendors. While IaaS gives the most flexibility, it also requires more user involvement and responsibilities. Research facilities needing high computing using supercomputers or clusters will benefit by using a scalable IaaS vendor. Big Data analysis also is a great use case for IaaS as it needs large workloads and a lot of processing. GE Healthcare, for example, uses AWS to collect, store, process and access worldwide – thus allowing its customers to obtain value from nearly a petabyte of health imaging data [Hoffman 2023]. As seen above, depending on the needs of the customer, Cloud vendors offer various types of delivery models. Another dimension of clouds is the type of deployment, as discussed next.

## Cloud Deployment Models

A Cloud deployment model classifies the type of cloud environment depending on factors such as ownership, location, access, and management responsibilities [Robinson 2024]. As Figure 1 [Peterson 2023] shows below, the four types of Cloud deployment models are Private, Public, Hybrid, and Community. We next briefly discuss these cloud deployment models.

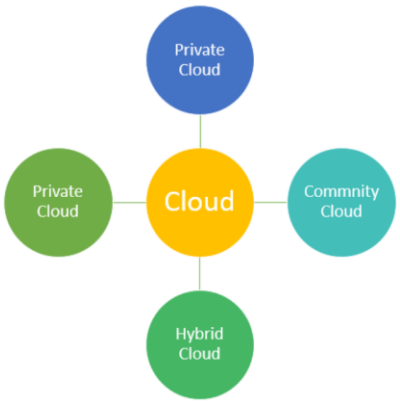


Figure 1: Cloud Deployment Models

*Private Clouds* are owned and operated by a single enterprise, and provides the information service needs for its departments, users, customers, and partners [Tavbulatova 2020]. Private clouds allow for a lot of customization and control, but also requires the enterprise to invest heavily in the entire Cloud deployment, including its security. Figure 2 [Peterson 2023] shows the general Private Cloud architecture. Private Clouds are used more often by relatively larger enterprises as it does need high capital and operational expenditures.

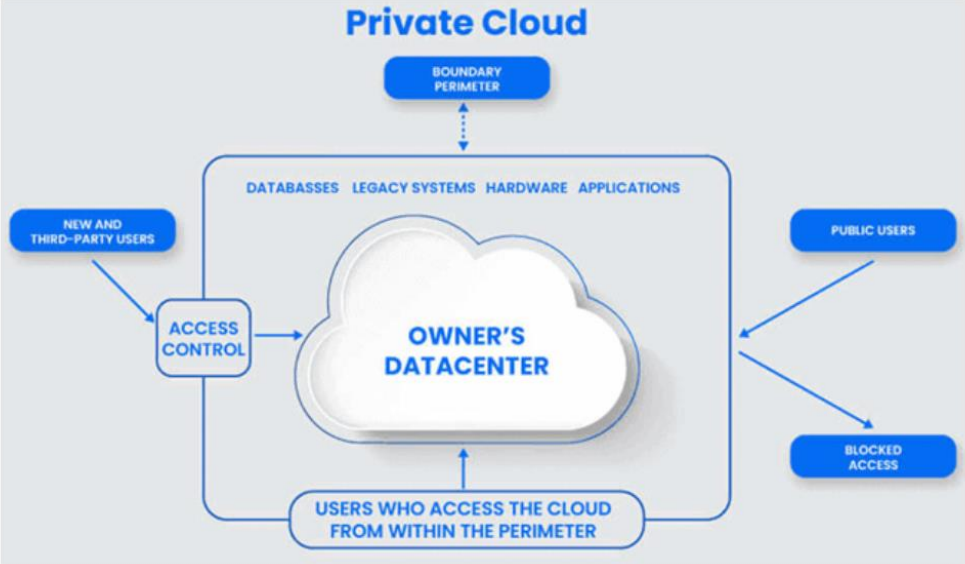


Figure 2: Private Cloud Architecture

*Public Clouds* are designed to provide computing resources to the general public or a group of companies, usually via the worldwide web, and uses a public Cloud vendor, such as Amazon Web Services or Microsoft Azure. The vendor is responsible for managing and maintaining the cloud, thus reducing the burden on the users. The cloud users typically use a self-service portal to use and manage the resources provided by the vendor [Tavbulatova 2020]. Public clouds are relatively simple to use, and are cost-effective for even small or medium sized businesses. They can provide unlimited quantity of computing resources (scalable), provide high data security, and allow for rapid system implementation and updates. However, it requires reliable, high speed internet connectivity, and limits the control of cloud operations. Complete dependency on the vendor system (including security vulnerabilities), and the higher risk of vendor lock-in are potential shortcomings [Golightly et al. 2022]. Figure 3 [Peterson 2023] shows the general Public Cloud architecture.

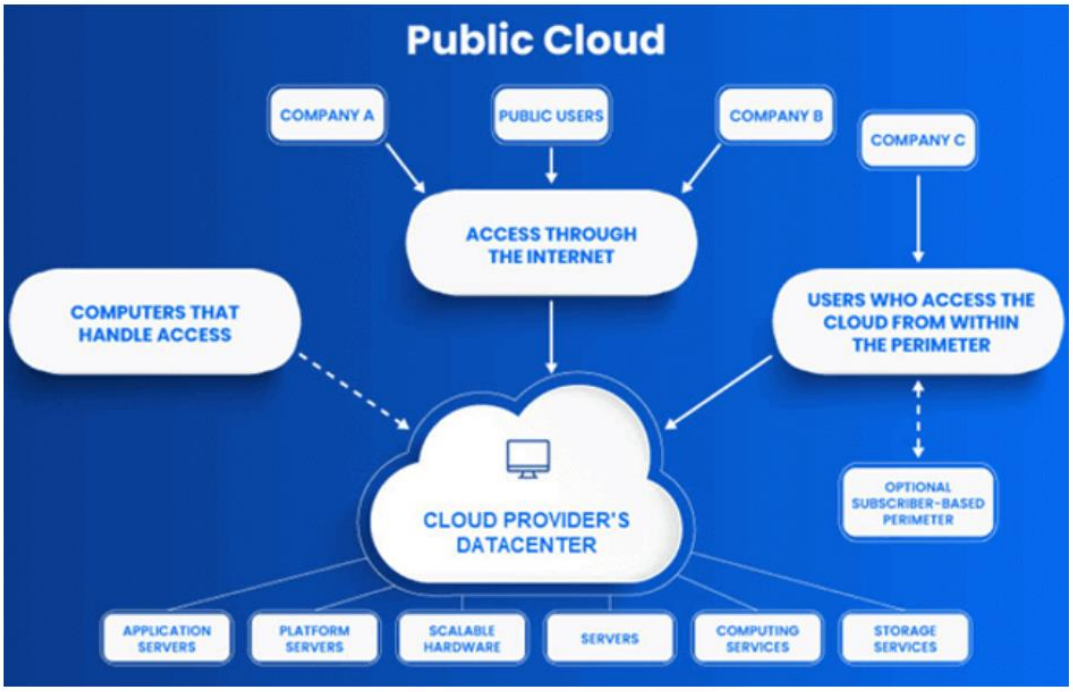


Figure 3: Public Cloud Architecture

*Hybrid Clouds* are a combination of public and private cloud models. The enterprise may need complete control over a portion of the system with sensitive data or mission critical applications, which can then be deployed on a Private Cloud and maintained in legacy systems. A Public Cloud Vendor can then be used for all other uses. The two types of clouds, along with any legacy systems, will then need to be integrated. Figure 4 [Peterson 2023] shows the general Hybrid Cloud architecture. Hybrid Clouds enable users to capitalize the flexibility of the Cloud, while still realizing value from traditional infrastructure, can maintain data security, reduce costs by transferring resources to cloud providers, increases the available processing power with provider resources, and moves loads from the local infrastructure to the cloud and back [Tavbulatova 2020, Golightly et al. 2022, Zhukovskiy 2017]. Management of Hybrid Clouds is also more complex [Peterson 2023].

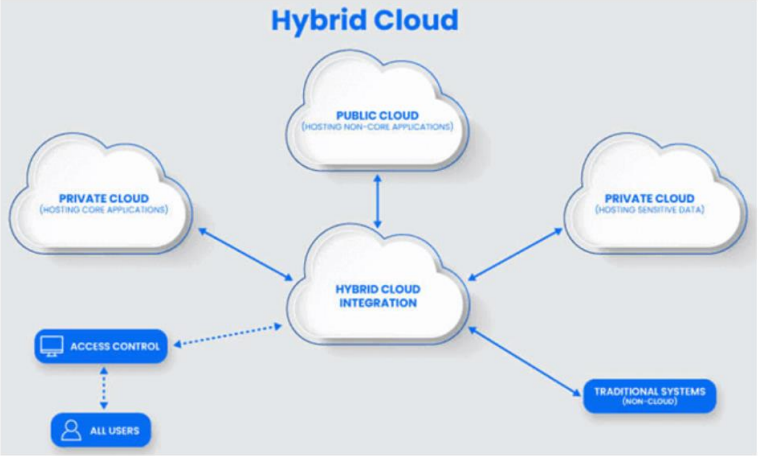


Figure 4: Hybrid Cloud Architecture

*Community Clouds* allow a group of organizations to share the resources and services using one of the aforesaid architectures (private, public or hybrid), but based on mutually agreed upon regulatory requirements. This Cloud computing model is operated and managed by third party vendors, community members or both [Peterson 2023]. The members of the community usually share similar security, privacy, performance, and compliance requirements. The community clouds allow remote storing and accessing of data/files on different computers and makes the data available anywhere in the world with low cost for data utilization [Tavbulatova 2020, Golightly et al. 2022]. A major drawback is security and segmentation because many different communities are involved [Peterson 2023].

Finally, it is worth mentioning that some enterprises choose multi-cloud deployment, in which it chooses to use multiple public Cloud vendors. This might be desirable to prevent getting locked-in to a particular vendor, better negotiation for pricing and features, and picking the best vendor for each feature. This approach does add to the complexity of Cloud services management, and it also requires personnel who are competent with products from various Cloud vendors. [Peterson 2023]. Table 1 [Peterson 2023] compares the strengths and weaknesses of the various Cloud deployment models.

| Parameters | Public | Private | Community | Hybrid |
|---|---|---|---|---|
| Setup and use | Easy | Need help from a professional IT team. | Require a professional IT team. | Require a professional IT team. |
| Scalability and Elasticity | Very High | Low | Moderate | High |
| Data Control | Little to none | Very High | Relatively High | High |
| Security and privacy | Very low | Very high | High | Very high |
| Reliability | Low | High | Higher | High |
| Demand for in-house software | No | Very high in-house software requirement | No | In-house software is not a must |

***TABLE 1: Comparing Cloud Deployment Models***

## ADVANTAGES OF CLOUD COMPUTING

There are many efficiencies and advantages to be obtained through the implementation of cloud computing, but the technology does not come free of potential issues or disadvantages. Every organization or consumer must critically analyze their specific needs, desired outcomes, and sensitive areas in order to determine whether or not the implementation of cloud computing is a strategically sound decision.

When looking at the possible advantages of cloud computing, many firms' initial interest is to gain operational efficiencies and reduce costs. Cloud computing has the ability to not only reduce operating costs, but also increase flexibility, reduce down time, quicker time-to-market, decreased deployment costs for new IT services, and increase security [Webroot 2022; Danave 2024]. Cloud computing allows for much seamless updates to software and hardware, as the cloud operators can do this more efficiently, and at a lower cost. Cloud computing can also eliminate costs in real estate, operations of facilities, personnel, and utilities required to house and maintain/manage servers and data storage centers. Crucially, less IT staff need to be hired and maintained on the payroll, while still having easy access to the latest technical skills from the cloud provider.

Many organizations will find that the costs associated with purchasing some form of cloud computing can be much lower than the costs they previously incurred when operating these technologies in-house. This also creates an advantage in terms of scalability. Not all firms have the capital or real-estate required to scale up their operations in terms of computing power or data storage. The Cloud offers virtually endless space to scale up operations at a more affordable rate. This is especially critical to smaller firms seeking to scale up their operations quickly and efficiently. Cloud computing also offers an advantage in terms of mobility. Essentially, cloud computing allows organizations to be more efficient, reduce costs, stay more flexible – all while accessing their Cloud based resources anywhere in the world.

A big advantage of Cloud computing is the ability to control costs, capacity, and performance on the fly. The auto-scaling feature of many Cloud services (like Amazon's AWS)

allows user applications to handle varying loads in real-time. This allows Cloud customers to only pay for resources being used, and handle varying loads. For example, when the popular augmented-reality game "Pokeman Go" was launched on Google Cloud, the game designers expected a worst-case scenario of 5x expected traffic load. The actual load turned out to be much greater at 50x the expected traffic load [Shivang 2022]; but the system worked flawlessly due to the auto-scaling feature. Google Cloud auto-scaler uses the Google Kubernetes Engine and Cloud Spanners to achieve this [Vergadia 2021].

It is worthwhile to see the evolution and advantages of Kubernetes with respect to cloud deployment. Initially, each server ran one application, so it was secure but very inefficient due to a lot of idle time, needing many servers (and needing more personnel, more real estate, more electricity etc). Virtualization, and the creation of Virtual Machines (VMs) was the next stage of evolution. In this each physical machine/server could have many independent applications and also operating systems. This considerably reduced the number of servers needed and increased utilization rates and reduced costs. But as Cloud computing came into the IT scene, it would be nice to decouple the application in each virtual machine from its own operating system, and low-level infrastructure so that those functions could be shared. This new decoupled virtual machine system was called containers. Containers are similar to a VM as it has its own filesystem, share of CPU, memory, and process space, but they are decoupled from the underlying operating system, so they are portable across clouds and OS distributions. Containers can be easily deployed, moved, deallocated, and reallocated in different computers and operating systems – in a dynamic way. These container advantages are very suitable for running on clouds or be portable across computers with different operating systems. In systems that need little downtime, it would be nice to quickly get another container working, if a container failed. This is where Kubernetes comes in – it is an open-source platform developed by Google to manage containers. Kubernetes can automatically run distributed systems with resiliency, allowing containers to be deleted and created over a cloud, making load balancing and scaling even more efficient.

The advantages and nature of cloud computing described above allow companies to use them for business continuity and disaster recovery. A local disaster will be a lot less disruptive if the business location faces a disaster, but had all or most of its computing infrastructure in a cloud. Another possible application would be collecting data from Internet of Things (IoT) sensors and applications. The sensors can be distributed over a large geographical area and collected a stored in the cloud. As the data volume increases or decreases, Cloud resources can be dynamically allocated.

Finally, a major benefit of migration to cloud based infrastructure is environmental sustainability [Webroot 2022]. The operational efficiencies mentioned above are partly due to the energy savings of using cloud-based servers that are typically newer and more energy efficient. Another reason is that many cloud data centers employ carbon offsets or use renewable energy source for their data centers, so using the cloud vendors automatically offsets some of the carbon used by IT. For example, Google Cloud plans to be 100% carbon free by 2030 [Lardinois, 2021], and Google offers a free feature that provides its users with custom carbon footprint reports that detail the carbon emissions their cloud usage generates.

## DISADVANTAGES OF CLOUD COMPUTING

As seen above, Cloud computing offers compelling potential advantages to many organizations, however, for some organizations, the potential disadvantages are more crucial. One of the concerns involves downtime and loss of control. When a company decides to use Cloud computing services, the infrastructure of the Cloud is owned, managed, and monitored entirely by the Cloud provider. Downtime and lack of control over that is a major concern. Since Cloud computing systems are all internet based, service outages are always a possibility that could occur at any time. In 2017, Amazon Web Services had an outage that cost publicly traded companies up to 150 million dollars [Larkin, 2020]. Outages and slowdowns are not something that companies can control, but the company could incur a major cost due to this. For companies to mitigate the risk that comes with outages, they have been designing their services with disaster recovery in mind. Services such as AWS Direct Connect, Azure ExpressRoute and Google Cloud's Dedicated Interconnect or Partner Connect are options that companies can implement. These services provide a network connection that is dedicated to keeping them online and reducing the risk of business interruption from public internet outage. Some organizations may just not want to put themselves in this vulnerable situation, and avoid Cloud services.

Another negative aspect is the potentially high costs of Cloud Computing – for some organizations, continuously paying for access to Cloud computing can eventually add up to a cost greater than if they would have purchased and installed the technology themselves on premise. In terms of costs, cloud computing can be a balancing act depending on the size and nature of the utilized technology.

Another major concern for Cloud users is cybersecurity, as hackers can potentially compromise the security of the Cloud vendor's data, software, and hardware. This is especially true in multitenancy, where many organizations share common resources of the Cloud provider. There is also the possibility for Cloud service providers to misuse the customer's data through means that were not previously agreed on. It is interesting that many online users have just given up on privacy and security. As a result, many are numb to the issue of data protection on the cloud or otherwise. About 20% of users don't care how much data they share online, while 26% believe it's "inevitable" that their data will be leaked so they don't worry about it [Gregalis 2022]. A recent study [Gregalis 2022] revealed that many adults shared private secrets on a cloud messaging service. About 16% shared their sexual fantasies, 14% shared sexist, racist, homophobic, or otherwise offensive comments. In addition, about 12% of the respondents admit to sharing details about substance abuse, while about 10% reported that they cheated on their partners.

What is surprising is that many share so much of their private data despite knowing the many damaging consequences of unsecured data. That same research [Gregalis 2022] also reported that 79% of those who have discussed private topics admit they could face serious consequences if their discussions online were leaked. Almost 50% admitted that any compromised data would ruin their relationships with friends or family, 28% would be left open to blackmail, 22% could lose their job, 19% their partners, or 10% even custody of a child. As

expected, the younger generation of online users is less concerned with data being leaked; especially about half [Gregalis 2022] were unconcerned with financial theft due to leaked data, though about 15% claimed that they were concerned with their online reputation.

A recent study [Ponemon 2022] surveyed 1,500 IT and security leaders, and reported that 60% of them are not confident in their organization's ability to ensure secure Cloud access, even as adoption continues to grow across a diverse range of cloud environments. Organizations face several barriers to securing their cloud environments, with the top challenges being network monitoring/visibility at 48%, in-house expertise at 45%, increased attack vectors at 38% and siloed security solutions at 36%. Many (62%) also indicated that traditional perimeter-based security solutions are no longer adequate to mitigate the risk of threats like ransomware, distributed denial of service (DDoS) attacks, insider threats and man-in-the-middle attacks.

The healthcare industry is a big user of Cloud services as it allows users to access data from multiple devices from anywhere that has internet, making traditional methods of storing data a thing of the past. The downside of cloud computing is the increased risk of being hacked or stolen by hackers. So, it is very crucial to only use HIPAA compliant cloud computing services. In healthcare, safeguarding protected healthcare information and abiding by HIPAA compliant cloud data storage requirements is a mandatory requirement. As a result, Cloud vendors are constantly looking for ways to make cloud-based system more secure. Things like improving the screening and hiring practices of employees and privileged users is also important, as not everyone should have this unlimited access.

While security technologies continue to advance, so too do the technologies used by hackers with malicious intent. Cloud service providers implement some of the best security standards, but there is always a risk when storing data on external services. For companies to deal with this limitation, they must understand the shared responsibility model of their cloud provider, and be aware of what their cloud provider covers in case of a security breach. For a company to reduce the risk of security, it is important for them to implement a risk-based approach with security and make security a core aspect of all IT operations. Cybersecurity threats will always exist, and this threat and lack of control on Cloud platforms, is often enough to deter some organizations from utilizing public Cloud computing.

Another big disadvantage for global organizations and nations is related to security of data and intellectual property housed in a Cloud Platform in a foreign country. Geopolitics and National security might also prevent certain organizations from using foreign Cloud vendors, or might require a global organization to store the country data within the country. An interesting example is Tiktok, the popular social media for sharing videos, which belongs to a Chinese company called ByteDance. Tiktok initially stored all US user data in private servers in Singapore and Virginia, but the US Government is worried that the Chinese government might summon the US data from ByteDance and pose a national threat. The data can also be potentially used for targeting misinformation to US citizens that harms USA and its citizens. USA then threatened to ban TikTok, unless all its data is stored in Infrastructure of a USA company and prevent transporting that data outside the country. Tiktok was then forced to spend billions of dollars by moving all data to Oracle Cloud servers and instituting protection so that the data cannot be transported to other countries [Fung 2022].

Vendor lock-in is another limitation of cloud computing. Once a company chooses to move to the cloud, it gets increasingly harder to get out of cloud-dependence [Shapira, 2021]. Switching between cloud services of different vendors has not become an easy or inexpensive process yet. The process for a company to switch from one cloud vendor to another is often costly and burdensome. The steep "switching costs" and vendor-stickiness could, in turn, incentivize cloud vendors to increase fees for customers over time, because the costs and time needed for switching to another cloud vendor are great barriers. There are many costs to consider such as Egress Fees, the cost of adding new services in the future and worse, lock one out of new features available with other vendors. [Banthia 2024].

Some services, like Amazon's AWS long-term Glacier service, even monetize their lock-in. While the company does charge a monthly storage fee based on how much users are storing, they don't charge anything for uploading data to the service. Users can upload a gigabyte or 100 terabytes and still pay the same $0.00 transfer fee. But data transfer above 1GB/month out of Glacier to the rest of the internet is charged, ranging from $90 per terabyte transferred down to $50 per terabyte, depending on how much users are moving. Even though it is not a tremendous fee for the amount of data, it still shows how Amazon wants to reduce the friction of uploading data and increase the friction of moving it back out. [Gewirtz 2021].

Due to the difficulties of switching vendors, there are now some Cloud Migration Services vendors that help users migrate services across cloud platforms. Capgemini, Accenture, Deloitte, and InfoSys are some of the leading cloud migration service vendors [Hein 2022]. The Cloud Migration Industry is poised to grow by USD 7.09 billion between 2019 and 2024, resulting in a 24% annual growth rate during the forecast period [Technavio 2022]. Another risk associated with changing cloud vendors is the possibility of exposing sensitive or proprietary data during the migration process. For a company to mitigate the risk of vendor lock-in and cloud migration, companies should design their cloud architecture with best practices. Cloud migration service vendors may also be very beneficial for risk mitigation.

It is up to each firm or consumer to determine whether the potential advantages outweigh the potential disadvantages when making the decision to implement cloud computing – whether it be outsourced or housed on-site. As stated above, Cloud computing has been shown to save time and money, as it is an efficient process. Although it has many benefits, cloud computing also has its limitations: Downtime, Security and Privacy, Limited Control and Flexibility, Vendor Lock-in, and Cost. Despite the preeminence of cloud architecture, we've seen numerous companies drop public cloud, whether partially or in full, in favor of setting up their own infrastructure with reasonable success. Dropbox is the highest-profile example, saving some $75 million over two years after bidding farewell to the Amazon cloud. And it's not alone in this push [Shapira 2021].

## CASE STUDIES

Lenovo's use of Microsoft Azure illustrates a great use of Cloud Services, even for large companies. Lenovo builds millions of computers for customers every year, and wants its customers to trust that each one arrives configured to the customer's request. To provide this

attestation, the company tracks each new device with its Trusted Supply Chain system, built with ledger in Microsoft Azure SQL Database. Lenovo chose the ledger in Azure because of the performance, scalability, and security of the Azure cloud platform. Lenovo is so pleased with the results that it is planning to use ledger in Azure SQL Database for additional high-security applications [Azure 2022]. Thorsten Stremlau, Lenovo's Chief Technologist and Executive Director of Commercial Product Portfolio, says that "Microsoft has extensive certifications in place for its own infrastructure, and we've seen more and more of our corporate customers moving to Azure as their trusted cloud platform," and adds that "the scalability of the Azure pricing model is also attractive and better than the competition."

Another interesting case is how Twitter migrated from an on-premise architecture to Google Cloud Platform to boost the reliability and accuracy of Twitter's ad analytics [Phalip 2020]. Twitter, as part of the daily business operations on its advertising platform, serves billions of ad engagement events, each of which potentially affects several downstream aggregate metrics. To enable its advertisers to measure user engagement and track ad campaign efficiency, Twitter offers advertisers a variety of analytics tools, APIs, and dashboards that can aggregate millions of metrics per second in near-real time. Twitter originally operated its Ad Analytics applications and data on its on-premise data center architecture. With time, Twitter's system was reaching its performance limits, getting harder to add or change functionality, and getting expensive to operate. The system was also prone to sporadic failures. So, Twitter decided to rethink the architecture and deploy a more flexible and scalable system in Google Cloud. Twitter began seeing huge benefits in just six months, after transitioning its ad analytics data platform to Google Cloud. Twitter's developers gained much agility, as they could easily configure existing data pipelines and build new features much faster. The real-time data pipeline has also greatly improved its reliability and accuracy, thanks to features of the Google Cloud Platform.

A recent interesting use case of Cloud Computing is the deployment of OpenAI's APIs for ChatGPT and Whisper. The ChatGPT API runs as a service via Microsoft's Azure on a Public, multitenant Cloud. Many users from different organizations will be sharing the same hardware, and hence the cost would be 10 times lower than the earlier version [Deutscher 2023]. This would likely allow many software developers to now incorporate ChatGPT based functionality in their software. OpenAI is also deploying a Whisper Transcription Service API via the Cloud, which would allow developers to deploy software with automatic transcription in either the original language, or translate it to English.

A final case illustrates how the PBS (Public Broadcasting Service) uses Amazon Web Services (AWS) Cloud Platform to efficiently stream videos [AWS 2020]. PBS has over 330 member stations and reaches over 100 million people through television, and 32 million people online monthly with diverse education and entertainment programming and applications. PBS uses Amazon Web Services (AWS) to bring its annual Short Film Festival to an online format, thus improving the performance of video streams. Since using Amazon CloudFront content delivery network, PBS has experienced 50 percent fewer streaming errors. PBS delivers nearly all of its video streaming through CloudFront, averaging more than 70 PB of content delivered monthly. In addition, PBS enhanced its archives with deep search functionality using machine learning and artificial intelligence (AI) – also running on the cloud. In summary, Amazon cloud

services innovated PBS's backend operations and content delivery and functionality and drove forward its mission of being a trusted window to the world.

## PRICING AND VENDORS

Pricing for cloud computing can vary depending on how much storage a company plans on using. The 'big three' commodity clouds are: Amazon AWS, Google GCP, and Microsoft Azure. Below is a summarized breakdown of their pricing structure.

Amazon AWS offers three different categories for their cloud pricing benefits: Pay-as-you-Go, Reserved Capacity, and Volume-Based Discounts. Pay-as-you-Go option allows customers to only pay for the services that they use and when they use the service. The Reserved Capacity is a very common cloud concept. This concept allows customers to reserve the amount of compute or storage that their company will need ahead of time, and this will save the company as much as 75% over the on-demand pricing. The last option is Volume-Based discounts based on economies of scale. The pricing is as follows. Up to 50TB of storage is 0.023 GB/month, while 500TB+ will reduce the cost to 0.021 GB/month. The more storage customers use, the less they will pay for each GB used [Gil 2022, Faddom 2022].

Google GCP pricing is also built around the pay-as-you-go model but promises no activation or termination fees. Google GCP offers four different pricing structures. GCP offers Preemptible VM Instances, this is for companies whose workload doesn't need a steady availability. This allows the company to set up their database to be interrupted when necessary, and saves the company up to 79%. The second pricing structure is Per-Second Billing, this allows companies to pay for exactly what they use by the second. Third is, Sustained- Use Discounts. This pricing structure decreases the rate with increased workloads running. Lastly, offered by GCP is Committed-Use Discounts [Faddom 2022].

The last of the 'big three' in the cloud computing world is Microsoft Azure. Azure's cloud pricing comes with the ability to reserve GB ahead of time, but in order to get price savings customers must have a one-to-three-year commitment. Azure allows a company to pay less for development and testing resources by including no software charges. Azure is most cost efficient when using Reserved capacity versus pay-as-you-go on Azure.

It is very important to manage costs in a cloud computing environment, which has spawned a whole new area called "Cloud Financial Operations," often referred to as just FinOps [Robinson 2024]. FinOps is the practice of bringing a financial accountability cultural change to the cloud computing, enabling distributed engineering, finance and business teams to make trade-offs among speed, cost, and quality in their cloud architecture and investment decisions. The FinOps framework developed by the FinOps Foundation [Finops 2024] is a structured way to tame the rising costs of cloud computing and maximizing its value to an organization.

## FUTURE DEVELOPMENT AND TRENDS IN CLOUD COMPUTING

The future of cloud computing definitely looks very bright, as it is expected to significantly change the way businesses operate - with over 90 percent of businesses utilizing it

for multiple reasons including, data backup, email, and disaster recovery purposes just to name a few [Wiggins 2022]. Cloud computing will give businesses the ability to create more personalized services for their customers and provide those services at a greater speed and lower cost. By tapping into the cloud, businesses will become more scalable as they would be able to service more customers. The cloud market is projected to grow from above $500 billion in 2022 to about $1.25 trillion in 2027, while storing 200 zettabytes (2 billion terabytes) in the cloud by 2025 [Griffiths 2023].

As the uptake of Cloud Computing marches on, there are several promising trends to take note of – ones which will make Cloud Computing even a more compelling technology for organizations. The major ones discussed next include Multicloud, Edge Computing, Artificial Intelligence, Serverless applications and better Cloud security.

Multicloud is when an organization utilizes two or more Cloud providers to run their applications [Danave 2024]. Cloud vendors can differ in pricing, capabilities, customer support, etc., so the ability to choose multiple vendors allows an organization to tailor each app to match the best Cloud provider. It also allows organizations to combat the major problem of vendor lock-in. Multicloud deployments also work well with DevOps development practices and cloud-native portability enhancing microservices architectures such as containers. Microservices allow applications to be split up into smaller independent parts such as containers. A single user query to a microservice based application can trigger a group of internal microservices (say, containers) and then stitch them together to compose a response to that user query. Furthermore, Multicloud deployments built on top of technologies such as Kubernetes (which was discussed before) allows for greater flexibility and portability across multiple Clouds and computing environments. So, it is getting easier to mix and match the services of different Cloud vendors.

Edge Computing, along with 5G cellular, IoT and Cloud Computing networks is another development that adds considerable value to IT eco systems. The proliferation of IoT devices such as sensors, wi-fi enabled devices like lawn irrigation, home automation, farm automation, factory automation etc. generates a lot of data that can be processed near the source of data collection using edge devices. The processed data (reduced, summarized data) then can be sent to data centers on the Cloud. Another example of using edge computing with cloud is streaming videos – a streaming service such as Netflix has high demand for newly released, popular content. So instead of streaming that popular content to every user from the central server housed on a Pubic Cloud such as Amazon's AWS, many temporary copies can be kept in several small edge devices (also known as micro data centers) in several locations in many cities, and streamed to the homes close to that micro data center. Advantages will be lower latency (lower delay) of high quality content, less network congestion on the overall network connecting all network users. Edge computing's main advantages are to process user requests as close to the data as possible, and reduce latency. If there is no Internet connectivity, these edge devices can transmit the data using 5G cellular networks that also have very low latency. Overall edge computing, along with Cloud Computing adds to operational efficiency and performance enhancement. This will continue to help with reducing network bandwidth requirements, and is expected that 2024 will be the year in which there will be seamless integration of edge computing with cloud services [Danave 2024].

Artificial Intelligence is another field that is increasingly being deployed to enhance Cloud computing. The first area of Cloud improvement is in the automation of Cloud efficiency and management in routine activities such as streamlining operations, provisioning, load balancing, self-healing, and security. The increased efficiencies clearly result in lower costs for the Cloud provider, and also makes the Cloud more responsive to customer needs, while keeping costs down. Cloud vendors can also offer AI as a Service (AIaaS) to customers. Organizations of all sizes can have easy and cost-effective access to AI to enhance their own operations. Cloud customers may use the AI for data analytics, predictions, or better customized experience for their own customers without investing large amounts for building their own AI systems. A Deloitte study found that 70% of companies got their AI capabilities through cloud-based software, and 65% create AI applications using cloud services [Brenner 2023]. Another example is the inclusion of AI-based "Einstein" in the CRM Cloud software provided by Salesforce. Einstein uses AI to analyze customer sales data and provide actionable tips that potentially enhance the customers' current sales strategies [Brenner 2023]. In summary, AIaaS offers organizations pre-built AI models, tools, and APIs hosted on cloud computing platforms. This enables organizations to seamlessly implement AI functionalities, even without specialized AI expertise and infrastructure [Danave 2024].

Serverless applications are another exciting development in the evolution of Cloud computing. Serverless applications are hosted on a Cloud and allow application developers to write code, but do not worry about the backend Cloud infrastructure required to run the applications. All the backend functions like allocating servers, memory, security etc. are completely handled by the Cloud provider. A very popular serverless application architecture is Function as a Service (FaaS). The developer writes the application as a collection of functions, each of which is triggered by some action, such as clicking on a weblink. The functions are loaded to the Cloud provider, and the functions Run on the Cloud, when they are invoked. The Cloud provider allocates all resources needed to execute the Function. In traditional cloud computing, the user still has to estimate the size of servers needed, space needed etc. and pay a monthly subscription for the chosen options, with an option to scale up dynamically. Typically, users pay for more than they need so as not to pay up for extra loads, but risk paying for a lot more resources than they really need, at normal times. In Serverless model, servers are still needed, but all the allocation, scaling etc. is completely done dynamically by the Cloud provider, and the user only pays for the resources used to run the functions, after which there is no other cost. This setup is perfect for functions that are used for short durations by few users, occasionally. The user only pays for resources, when they are used, after which the servers can be used by other Cloud users, resulting in lower user costs.

Serverless applications scale automatically, and do not even need other management platforms like Kubernetes for Container management (which was discussed before). Developers of these serverless applications can mostly focus on the code development and not worry about any hardware issues, so their productivity and update cycles are greater. There are disadvantages to this serverless approach such as latency, security and debugging [Hadidi 2022]. When serverless functions are triggered, it takes some time for the Cloud provider to set up all the needed resources. This delay is noticeable when the function is called for the first time or after a

certain long time period during which the function is not used. The Cloud provider deallocates all resources if the function is not triggered for a while, so that the hardware can be used by other users. That also leads to possibly less security, as the same server is used by several users and, if not properly configured, data could be leaked to other users. Another current problem is the lack of visibility of the backend after deployment, and the added complications to debugging the code on the Cloud Platform. In summary, serverless applications, in its current form, are particularly suited when applications can be designed as a collection of relatively decoupled functions, that do not require a relatively large compute workload over an extended period of time. Serverless Computing is growing at a blazing Compound Annual Growth Rate (CAGR) of 23.17% between 2023 and 2028 [Danave 2024].

Finally, as described in the disadvantages section above, security is always a major concern for organizations deploying their mission critical systems on a Cloud. The evolving Zero Trust Network Access (ZTNA) [Ponemon 2022] can address many of these security challenges, and also accelerate the adoption of cloud services. ZTNA is an IT security solution that is more secure than traditional VPNs. VPNs provided secure access to entire networks, but was unable to control access within the network. ZTNA provides superior secure remote access to an organization's applications, data, and services using well defined access control policies. Each user or role can have access only to specified IT resources (such as cloud services or applications) in the network. As organizations adopt multi clouds, ZTNA provides secure, robust, and well-controlled access that doesn't assume any implicit trust but creates an identity-based, context-based, logical–access boundary to applications. ZTNA can be implemented as an in-house stand-alone product for cloud-averse organizations or as a service on Clouds. According to Gartner, almost 90% of organizations use ZTNA-as-a-Service on a Cloud platform. Some of the top ZTNA vendors are Palo Alto Networks, Z-Scalar, Cloudfare, Akamai and Cisco.

As cloud-native development practices grow, 90% of respondents will have adopted DevOps, and 87% will have adopted containers within the next few years, but modern Cloud security practices aren't as widespread. For instance, only 42% can confidently segment their environments to apply the principle of least privilege, and nearly 33% of organizations have no collaboration between IT security and DevOps, thus presenting a significant risk. Respondents that have adopted a ZTNA strategy report 65% more productivity of the IT security team, 61% stronger authentication using identity and risk posture, 58% increased productivity for DevOps and about 58% increase in network visibility and automation capabilities, as the top benefits [Ponemon 2022]. In the next year or two, significant advances in ZTNA is expected as established cloud vendors acquire promising ZTNA startups and integrate ZTNA features in their existing platforms [Ray 2024].

## SUMMARY & CONCLUSION

Cloud computing is rapidly reshaping the computing landscape, offering organizations and individuals alike unprecedented access to resources and agility. By shifting from on-premise infrastructure to cloud-based services provided by giants like AWS and Azure, businesses gain strategic advantages. They optimize costs, scale computing power on demand, and free up

internal resources to focus on core competencies and customer needs. Cloud computing not only streamlines operations but also democratizes access to computing resources, enabling small organizations, researchers, and end-users to benefit from global-scale applications, data analysis, and digital media storage.

In conclusion, this paper provides a comprehensive understanding of Cloud computing, spanning its nature, architecture, and diverse delivery models. Through insightful case studies, it highlights the real-world applications of cloud technology, illuminating both advantages and disadvantages. A critical analysis of major cloud service vendors and associated costs deepens the understanding of the landscape. Furthermore, the exploration of future trends in cloud computing sheds light on potential developments. The future of computing undoubtedly lies in the Cloud. As technology continues to evolve, embracing the Cloud's potential will be crucial for staying competitive, fostering innovation, and unlocking limitless possibilities.

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# ACADEMIC DISHONESTY IN FINLAND: RELIGIOUS AND DEMOGRAPHIC DIFFERENCES

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## ABSTRACT

*We examined Finnish business majors' behaviors and attitudes towards academic dishonesty (AD) and how religion affects their views. Finland is unique because of a national religion and historically a heavy church involvement in public education. In the current project, we surveyed undergraduates (n=136). We used two scales, one for AD attitudes, one for AD behaviors, both of which had high reliability. With factor analysis, we reduced the scales to three variables and found religion impacted academic ethics by three facets: denomination, intensity, and level of participation. In addition, we found significant differences based on gender, age, First Generation status, military experience, and employment.*

Key words: *Survey, Academic dishonesty, Finland, religion*

## INTRODUCTION

Cheating. No one word causes such consternation among academics as cheating. The conventional wisdom is that cheating is both pervasive and world-wide (Grenness, 2022). Sadly, evidence abounds of students violating the most basic ethics. Does religion make a difference in students' behaviors towards academic dishonesty? The conventional wisdom would be in the affirmative. A religious person is a more ethical person, at least the assumption would claim (Xygalatas, 2017). Atheists, those without religion, would be assumed to be less ethical. We decided to test these assumptions in the current project.

Religious people describe themselves as being more ethical, honest, and empathetic. However, in actual behaviors, differences were not found (Xygalatas, 2017). When examining religious versus non-religious people researchers provide evidence that while there were differences in individuals stated views, religious versus non-religious individuals did not differ in their actions. Moral behaviors and immoral behaviors were equally as common among religious and non-religious persons (Hofmann et al., 2014). Perhaps the conventional wisdom is incorrect.

This study will examine an under-studied population, Finnish students, and their views toward academic ethics. The current project adds to the knowledge of the discipline by examining this understudied group of future Scandinavian leaders. Finland's ethical climate is

exceptional. Finland is tied for first place as the least corrupt country in the world, according to Transparency International's Corruption Perceptions Index (2022) Finland tied with Denmark and New Zealand for the top spot. Finland's excellent status is longstanding. When comparing many nations through the 1980's and 1990's research provides evidence that Finland one of the least corrupt nations (Treisman, 2000).

Furthermore, The Nordic Business Ethics Survey (NBES), annually since 2019, measures ethical views of business workers from Finland, Norway, Sweden, Denmark, and Estonia (Romberg & Ratsula, 2023). The NBES demonstrates that Finland (and the other countries included) have strong ethical mindsets in the workplace, and these guide the economy of these nations. Finland has been a leader in corporate criminal liability to address business wrongdoing, and not surprisingly Finland had almost perfectly clean politics (Tolvanen, 2009; Zook, 2009). This comes from their core values and educational background. Finnish students and found they had strong ethical orientations for employees, the environment, and their community (Ludlum, et al., 2013).

How does Finland achieve such consistent high ethical evaluations? National religion is part of the answer. Finland had incorporated Lutheran religious curricula into basic education (Zilliacus & Holm, 2013). Students formerly were required to take religious instruction as part of their program for all students, ages 7-16. The national curriculum used to include approximately one hour per week for religious education in every grade (Fin. katsomusaineiden opetus) but currently, 14 non-Lutheran options are offered as secular ethics including Judaism, Islam, Buddhism, and Catholicism (Fin. elämänkatsomustieto) (Lipiainen, et al., 2020).

The Lutheran Church, intertwined with the welfare state, dominates Finland's religious culture. The Lutheran Church accounts for sixty-nine percent of the population (Expat-Finland, 2022; Lipiainen et al., 2020), down eight percent in less than a decade (Markkola, 2014; Vogelaar, 2013). The second largest religion in Finland is being non-religious at twenty-seven percent (Lipiainen, et al., 2020). Even with a national religion, fifty-four percent of Finns describe themselves as "neither religious or spiritual," and fifty-eight percent claim to seldom or never attend Lutheran religious services (Lipiainen et al., 2020).

Since most ethical views are framed by religious influences, Finland provides a unique example with a national religion. We surveyed Finnish college students in the spring of 2019 on academic ethics. To support this analysis, we will first review the relevant literature. Next, we will examine the survey methods. Then, we will discuss the findings. We conclude by suggesting further research in this area.

## REVIEW OF THE LITERATURE

Academic dishonesty is a hot topic and most of the news is not flattering. With the rise of artificial intelligence, cheating is becoming even easier and more concerning in academics and the workplace. The most examined population is American college students. McCabe, Butterfield, and Trevino (2006) surveyed graduate business students from fifty-four schools in the USA and Canada on thirteen specific unethical behaviors. They found fifty-three percent of business students admitted one or more cheating incidents.

Not all nations are equal when it comes to academic dishonesty. When examining business and economics students across forty-two universities in twenty-one countries researchers found that Scandinavian students (Sweden and Denmark) have a lower probability of cheating compared to students from Eastern Europe (Teixeira & Rocha, 2010). Teixeira (2013) studied undergraduate students from twenty-one countries (not including Finland) and found that countries with higher levels of corruption showed higher rates of cheating on exams.

For business programs, the news is especially bad. In a sample of American universities, business students were significantly more likely to cheat than non-business students (McCabe, 1997). When examining undergraduate students on seventeen specific cheating behaviors researcher found that eighty-three percent of students cheated at least once in college, and fifty-five percent had done serious cheating (exam or plagiarism) during college (Rettinger, et al., 2004). However, not every student has the same propensity or likelihood to cheat. Males were much more likely to cheat across all seventeen behaviors. (Rettinger, et al., 2004).

In reviewing American universities, it is important to examine universities that consider themselves to have a "religious component" built into their core educational system. When examining undergraduate students at a religious school in the United States on multiple cheating behaviors, researchers found that students described cheating as "disturbingly common" (Rettinger & Kramer, 2009). Almost seventy-five percent of students engaged in at least one behavior, and over thirty-five percent reported serious cheating (plagiarism or exam cheating) (Rettinger & Kramer, 2009). Additionally, when comparing business and leadership students from the United States researchers found that business students cheated more often than non-business students and had more tolerant views of cheating than other students (Simha, et al., 2012). Therefore, it is imperative to examine different cultures and areas to see if the problem is inherent among all students or if there are some factors that could be changed to help decrease rampant cheating.

Although there has not been much research about the academics in Finland, Finland is known to have had their workplace and their ethical views have been extensively examined in the literature (Huhtala, Kangas, Lamsa, et al., 2008; Lamsa & Takala, 2000; Kujala, 2001& 2010; Kujala et al., 2011; Riivari & Lamsa, 2014; and Vuontisjarvi, 2006). However, once the graduates are in industry, higher education will have little if any impact. Löfström et al., (2015) interviewed fifty-six professors in Finland and New Zealand on academic integrity. The professors summarized, "university teachers at our institutions are united in respecting the importance of academic integrity, but not of one mind about what it is, how it should be taught and whose responsibility it is to teach it" (p. 446).

Research on academic ethics (cheating) with a Finnish undergraduate sample is sparse. Finnish business students were asked questions about unethical behaviors and found that sixty percent of Finnish college students claimed to have not seen a student cheat on an exam (Ludlum et al., 2017). The number dropped to thirty-nine percent when asked about taking credit for another student's work on any assignment. As students progressed (year in school), the number who witnessed cheating increased. Interestingly, students were hesitant to report another student cheating. Less than half would always report the offending student and a small portion, less than ten percent, would never report the unethical behaviors of another student.

Another project examined Finnish business students and their views on academic cheating and found Finnish students were highly motivated to do his/her own work, but at the same time were uncomfortable with being obligated to report academic dishonesty of other students (Ludlum et al., 2021). When comparisons were made, they found female and more experienced students were more ethical. They summarized that the rate of cheating in Finland was far below similar studies in the United States.

For comparison, we will use the extensively examined USA college student population. Surveys of student cheating in the United States are shockingly candid about the widespread academic dishonesty on campus. Harding, Carpenter, Finelli, and Passow (2004) surveyed technical students and found seventy-nine percent cheated at least once per term. Furthermore, in another study of undergraduate students and found ninety percent admitted to an academically dishonest act at least once (Hard et al, 2006).

Results of student cheating are not always consistent. This is caused by the difficulty in finding and exact definition for "cheating." There is not one operationalized definition of cheating. Teixeira & Rocha (2006) defined cheating in their study as copying the work of others. Not even scholars in academic ethics can agree on a single definition of cheating.

The wide array of results was influenced by the definition of cheating used in each survey. When surveying college students from three small colleges researchers found different rates of cheating based on the individual act. Plagiarizing a complete paper was rare while over fifty percent of students reported copying answers on an exam and eighty-four percent witnessed others copying answers on an exam (Qualls, 2014). Similarly, Rakovski and Levy (2007) surveyed business students and found more than sixty percent cheated on homework but less than four percent cheated on exams.

Cheating is a global problem. When examining the next few studies, there are a multitude of reasons and justifications for cheating, but the problem is that students across the world are cheating, and we do not have a model or cultural blueprint to reduce cheating at the university level. Egyptian students indicated "*pressure to achieve"* was a major factor to their decision to engage in academic dishonesty (Click, 2014). Comparing American and Japanese college students, Japanese students reported more instances of cheating on exams as well as a greater tendency to justify it (Diekhoff et al., 1999). Also, Dubljević, Sattler, and Racine (2014) surveyed four German Universities and found the use of cognitive enhancers (drugs or devices designed to aide or improve thinking) had low student acceptance. Taiwanese students were surveyed by grouping them by job status (Hsiao, 2015) and found the propensity to cheat varied between part-time and full-time employees (full-time workers were more likely to cheat).

Additionally, researchers examined students in Taiwan and found cheating is common on exams. Fifty-nine percent of students would never report exam cheating to the instructor (Ludlum & Gwinner, 2016). Murtaza et.al. (2013) surveyed student's perceptions of plagiarism via a survey of thirty-five Pakistani universities in which they researcher found evidence that ninety-four percent of respondents were unaware of their university's integrity policy. Adding to this list of cheating at a global level, almost seventy-five percent of medical students in Turkey had cheated during multiple-choice tests (Semerci, 2006). When examining graduates of management studies in Israel, researchers provided evidence that native-born Israeli students

cheated more than the non-natives and the older students cheated less than younger students (Siniver, 2013). Teixeria and Rocha (2008) Another study examined the difference of Portuguese students and Spanish students finding more Spanish students admitted to cheating than Portuguese (Teixeria & Rocha, 2008).

We should be cautious to assume the same results from one culture to another. Hofstede (1983, 1991, 1993) argued cultural differences impact conduct in business and decision-making. Socialization and training also influence personal values (Hofstede, 1991).

Religion is a significant factor, as faith is often the foundation for a person's ethical beliefs. Several studies have found religion impacted academic dishonesty. Etter, Cramer, and Finn (2006) surveyed students at a private church affiliated college and at a major research university and discovered the students at the religious school rated cheating as more offensive than did students at a non-religious affiliated school. Also, when undergraduates at a private religious university observed others cheating, that strongly influenced one's own cheating behaviors (Rettinger & Kramer, 2009).

Smyth, Davis & Kroncke (2009) surveyed students' perceptions of business ethics by comparing religious and (state) non-religious institutions. They found students at a Baptist college had more reaction to unethical behavior than state school students. Additionally, the state school students had a greater reaction than students at the Catholic school. It is certainly premature to claim one religion is more ethical than another, but it does support the idea that religion does have an effect, but the effect on ethics might not be uniform.

Religion should have significant importance in a Finnish sample, with one religion (Evangelical Lutheran Church of Finland) being so dominant. However, the dominance of church membership may not indicate agreement with those beliefs. Pauha et al., (2020) noted that half of the atheists in Finland are members of the Lutheran Church. Based on these arguments, we hypothesize the following:

> *Hypothesis 1: The religious denomination of Finnish business majors significantly influences their attitudes toward academic dishonesty.*

Cheating is also influenced by age. When surveying college students' researchers found that those who cheated were less mature (younger, financially dependent on parents, less likely to be married) (Diekhoff et al., 1996). Similar findings came from Harding, Carpenter, and Finelli (2012) who surveyed engineering undergraduates from three different universities and discovered first-year students were more likely to cheat than seniors. Therefore, we hypothesize the following:

> *Hypothesis 2: The age of Finnish business majors significantly influences their attitudes toward academic dishonesty.*

Gender has been found to be a significant indicator of who cheats. When examining a Midwestern university researchers found male students displayed more overall instances of cheating than did female students (Miller, et al., 2011). Similarly, Niiya, Ballantyne, North, and Crocker (2008) found males were more likely to cheat than females. Specifically, when

surveying business students, males were more academically dishonest than females (Rakovski & Levy, 2007). Gender differences exist even when considering the students' major and the time spent working on the course, as females consistently ranked cheating as less acceptable (Becker & Ulstad, 2007).

*Hypothesis 3: Finnish female business majors will cheat less than their male counterparts.*

## METHOD FOR THE SURVEY

### Participants

The participants are from a university of applied sciences in Helsinki, Finland, affiliated with the authors. The two divisions of higher education in Finland are universities (research-based) and polytechnics (applied science) which train for labor market needs (Jääskelä & Nissilä, 2015). Finland has 13 universities and 23 universities of applied sciences (Fulbright Finland Foundation, 2022). The school we examined represents the second part of this division. Both types of institutions reflect Finland's higher education system as heavily rooted in the welfare state principal of equal opportunity (Välimaa, 2012). However, because of the different educational missions, the students might not be similar.

Finland has a generous social program for students, and free tuition for students inside the European Union. Previous studies on Finland's students are limited because of the small population, about five and a half million (Statistics Finland, 2022). Finland's culture is guided by the Nordic Welfare model, which includes generous comprehensive and universal social entitlements (Keskinen, 2016) which handles retirement, child benefits, unemployment, health insurance, and student financial support (Kela.fi, 2022). The welfare state is a cornerstone of Finland's national identity (Kettunen, 2011). The Nordic welfare model, high taxes free and equal access to a broad scale of social services (health care, training, pensions, and education, to name a few) is provided without concern of income or economic need (Frelle-Petersen, Hein, & Christiansen, 2020). Finland's higher education system supports students with no tuition, a variety of grants for housing, and very low interest loans, even subsidies for meals on campus (Frelle-Petersen, Hein, & Christiansen, 2020; and Bridgestock, 2021). As a result, Finnish higher education is often without out-of-pocket expenses. In fact, Finnish students do not typically buy a textbook, rather they use online texts or borrow books from the library (Fulbright Finland Foundation, 2022).

All the participants were business majors. The respondents were in the following academic years: first, 81%; second, 8%; third, 7%; and fourth, 4%. Upperclassmen were underrepresented in our sample. Males outnumbered females 53% to 47%. Our group consisted of primarily traditional students (76% were aged 18-22). Only 6 students (4.7% of the respondents) were married, and only 3 students had children. Most students worked while attending school (64%), predominantly part-time work.

In religion, Lutheran/Christian was the dominant group with 47%, while 45% identified as non-religious. Other students were spread among all other faiths. To our surprise, students

were not very active in religion. Few students (13%) attended church once a month or more, and only one student identified with being "strongly religious."

Military experience was much higher in the Finland sample (35.4%) than in other student groups. In Finland, military service is required for all men and this obligation is usually completed while they are 18-20 years old (Laukkala, Partonen, Marttunen, & Henriksson, 2014). Military service by women is voluntary.

## Procedures

The current project involved a self-assessment/self-reporting of students' views and ethical behaviors. A convenience sample was taken from large classes at Arcada University of Applied Sciences (2023) in Helsinki, Finland in the spring of 2019. The survey was conducted in English. The students at Arcada are multilingual (Finnish, Swedish, and English), with several programs taught in English to benefit their international student exchange programs. Finland has always been a multilingual country, becoming independent in 1917 with two official languages and several official minority languages, such as Sami (Kotimaisten Kielten Keskus, 2022; and Anckar, 2000).

Students were asked to complete the questionnaire during class time. The survey instrument was voluntary and anonymous. No inducements were offered to the students to participate. A total of 136 surveys resulted. However, some questions had fewer than 136 responses. The text of the questions is in the appendix.

## Measures

The first scale (Attitudes) examined students' views on academic bad behaviors and was a replication of the 19 questions used by Simha, Armstong, & Albert (2012). The Attitudes first scale used a Likert type rating of: 0=Not Cheating, 1 = Trivial Cheating, 2 = Serious Cheating. The full text of the Attitudes scale is reported in Table 1.

The second scale (Behaviors) was based on the first scale but modified to put the general statements into a first-person format ("I have done…") to measure behaviors rather than attitudes. The Behaviors scale used a Likert type ranking about his/her own behavior, 1. Never, 2. Rarely, 3. Sometimes, 4. Many times, and 5. Always. The full text of the Behaviors scale is reported in Table 2.

We reported the means and standard deviations on all questions. In addition, when comparing demographic sub-groups, we used Chi-Squared tests. We used SPSS version 24 for analysis. The complete text of demographic questions is in the appendix.

# FINDINGS AND DISCUSSION

Surveying students about academic ethics is a challenge as many would not be candid about their own wrongdoing. We were best able to minimize the socially appropriate response bias by using a large group survey, anonymous results, and confidential submissions. The overall findings on Attitudes are displayed below.

**Table 1. Means on Attitudes toward Cheating**

| 0=Not Cheating, 1 = Trivial Cheating, 2 = Serious Cheating | Mean | Stnd. Dev. |
|---|---|---|
| ATC1 Copying homework assignments from others. | .90 | .556 |
| ATC2 Allowing others to copy homework assignments from you. | .81 | .565 |
| ATC3 Collaborating with others on assignments meant to be completed alone. | .60 | .670 |
| ATC4 Collaborating with others on tests meant to be completed alone. | 1.38 | .760 |
| ATC5 Using unauthorized cheat-sheets on an exam. | 1.64 | .729 |
| ATC6 Looking at or copying from other's exam copies. | 1.61 | .670 |
| ATC7 Allowing others to look at or copy from an exam copy. | 1.26 | .733 |
| ATC8 Obtaining exam questions illicitly beforehand. | 1.47 | .677 |
| ATC9 Telling another student what is on the exam before he/she takes it. | .87 | .678 |
| ATC10 Using authorizing electronic equipment for use in exams | 1.23 | .825 |
| ATC11 Fabricating bibliographies on assignments/papers. | 1.25 | .727 |
| ATC12 Copying from a source without citing source | 1.17 | .697 |
| ATC13 Obtaining papers from the web and turning them as your own work. | 1.63 | .686 |
| ATC14 Making other write your papers for you, and then turning them in as your own work. | 1.48 | .740 |
| ATC15 Referencing materials without reading them. | .96 | .679 |
| ATC16 Falsifying grades scores. | 1.63 | .679 |
| ATC17 Changing one's answers after getting the grade in order to increase one's score. | 1.47 | .713 |
| ATC18 Making false and fraudulent excuses to postpone assignments and/or tests. | 1.04 | .719 |
| ATC19 Falsifying school documents (i.e., doctor notes, parking permits, or certificates). | 1.48 | .769 |

The lower the mean, the less serious students considered the offense. The higher the mean, the more serious students viewed the offense. To no one's surprise, students viewed copying homework (out of class assignment) as low-level cheating, even when the assignment was meant to be completed alone. Moderate cheating includes collaborating on tests and small instances of plagiarism. Serious cheating includes wholesale cheating on exams and completely plagiarized projects, as well as trying to falsify one's scores.

## FREQUENCY OF CHEATING

The second scale, Frequency of Cheating (FOC) used a self-reporting scheme on a student's personal behaviors. These statements were put into the first person (I have done ___). Since we relied on self-reporting, we cannot confirm the reported behaviors match actual behaviors, but this is the only possibility when using an anonymous survey. As a result, these findings represent unconfirmed bad behaviors. The complete results are shown below.

**Table 2. Frequency of Cheating and Means.**

| **How would you describe your own behavior? For the following questions, use this scale: 1. Never 2. Rarely 3. Sometimes 4. Many times 5. Always** | **Mean** | **Stnd. Dev.** |
|---|---|---|
| FOC1 I have copied homework assignments from other students. | 2.38 | .951 |
| FOC2 I have allowed students to copy homework assignments from me. | 2.77 | .966 |
| FOC3 I have collaborated with others on assignments I was supposed to do alone. | 2.92 | 1.009 |
| FOC4 I have collaborated with others on take-home exams I was supposed to do alone. | 2.30 | 1.118 |
| FOC5 I have used an unauthorized cheat sheet on an exam. | 1.35 | .621 |
| FOC6 I have looked at or copied from someone else's exam during a test. | 1.62 | .739 |
| FOC7 I have allowed others to look at or copy from my exam during a test. | 1.84 | .955 |
| FOC8 I have obtained the test question beforehand illegally. | 1.41 | .711 |
| FOC9 I have told another student what is on an exam before he/she took it. | 2.59 | 1.125 |
| FOC10 I have used unauthorized electronic equipment for help on an exam. | 1.36 | .673 |
| FOC11 I have fabricated a bibliography. | 1.22 | .518 |
| FOC12 I have copied information from a source for a paper without citing the source. | 1.91 | .857 |
| FOC13 I have obtained a research paper from the web and handed the paper in as my own. | 1.36 | .737 |
| FOC14 I have had others write my research paper for me, and then handed the paper as my own. | 1.25 | .613 |
| FOC15 I have referenced materials without truly reading them. | 2.10 | .951 |
| FOC16 I have falsified grade scores. | 1.22 | .588 |
| FOC17 I have changed test or assignments answers after getting my grade score. | 1.22 | .515 |
| FOC18 I have made fraudulent excuses to postpone exams or assignments. | 1.58 | .757 |
| FOC19 I have falsified school documents (i.e., parking, permit, certificate, doctor notes etc.) | 1.31 | .789 |

The lower the mean, the less frequent the behavior was reported. The higher the mean, the more frequent the behavior was reported.

We divided the behaviors into three categories: low frequency behaviors, which included exam cheating, fabrication/plagiarism, and altering scores; moderate frequency behaviors, which included copying an answer during an exam and false excuses to avoid assignments; and frequent cheating which included copying or sharing homework answers or collaborating on projects meant to be completed alone.

The survey had face validity. As a test for internal consistency, we conducted Cronbach's alpha for the two scales. The first scale, Attitudes, was a replication of the 19 questions from Simha, Armstrong, & Albert (2012) and the Cronbach's alpha was .910. The second scale of 19 questions (Behaviors) had a Cronbach's alpha of .902. Both scales were well above the 0.70 threshold for research.

We determined overall cheating levels for Finnish business students based on our sample. We found that 83.09% admitted to minor cheating on exams (FOC8-9); 83.83% admitted to

serious cheating on exams (FOC4-5-6-7-10); 94.86% admitted to cheating on homework (FOC1-2-3); 80.15% admitted to minor plagiarism (FOC11-12-15); 30.89% admitted to serious plagiarism (FOC13-14); 51% admitted to falsifying scores (FOC16-18-19); and 21% admitted to false excuses (FOC17). These results, while high, include doing these behaviors at any time in higher education. In addition, these results are not dissimilar to the behaviors in other nations.

To make further comparisons, an Exploratory Factor Analysis (EFA) was performed using principal component analysis and varimax rotation. The minimum factor loading criteria was set to 0.50. The communality of the scale, which indicates the amount of variance in each dimension, was also assessed to ensure acceptable levels of explanation. The results show that all communalities were over 0.50.

An important step involved weighing the overall significance of the correlation matrix through Bartlett's Test of Sphericity, which provides a measure of the statistical probability that the correlation matrix has significant correlations among some of its components. The results were significant, approximate chi-square (n=115) = 2794.21, df=703, ($p < 0.001$), which indicates its suitability for factor analysis. The Kaiser–Meyer–Olkin measure of sampling adequacy (MSA), which indicates the appropriateness of the data for factor analysis, was 0.794. In this regard, data with MSA values above 0.800 are considered appropriate for factor analysis. Finally, the factor solution derived from this analysis yielded three factors for the scale, which accounted for 48.49% of the variation in the data.

In this EFA, 12 items (ATC1-2-3, ATC9, ATC12, ATC15, ATC18, FOC6-7-8, FOC10, & FOC12) failed to load on any of the three factors significantly. Hence, these 12 items were removed from further analysis.

The three factors identified as part of this EFA aligned with the theoretical proposition in this research. Factor 1 included 12 items (ATC 4-8, ACT 10-11, ATC 13-14, ATC 16-17, and ATC19), referring to *CHEAT_ATTITUDES (CA*). Factor 2 included 8 items (FOC5, FOC11, FOC 13-14, and FOC 16-19, which represents *CHEAT_SIGNIF (CS*). Factor 3 included 6 items (FOC 1-4, FOC9, and FOC15 referring to *CHEAT_MINOR (CM).* Factor Loadings are presented in the table below.

**Table 3. Factor Loading, PCA with varimax rotation.**

| Item | Factor 1 (CA) | Factor 2 (CS) | Factor 3 (CM) |
|---|---|---|---|
| ATC13 | .889 | | |
| ATC5 | .860 | | |
| ATC6 | .860 | | |
| ATC16 | .852 | | |
| ATC14 | .785 | | |
| ATC19 | .783 | | |
| ATC8 | .770 | | |
| ATC17 | .704 | | |
| ATC4 | .665 | | |
| ATC7 | .631 | | |
| ATC11 | .605 | | |
| ATC10 | .551 | | |
| FOC17 | | .889 | |
| FOC16 | | .851 | |
| FOC19 | | .748 | |
| FOC14 | | .708 | |
| FOC11 | | .703 | |
| FOC13 | | .603 | |
| FOC5 | | .569 | |
| FOC18 | | .526 | |
| FOC3 | | | .797 |
| FOC1 | | | .765 |
| FOC2 | | | .701 |
| FOC4 | | | .698 |
| FOC9 | | | .568 |
| FOC15 | | | .516 |
| | | | |
| **Variance** | 22.049 | 19.517 | 6.931 |
| **Cumulative** | 22.049 | 41.566 | 48.496 |

For each factor an internal reliability test was done. Factor 1 (12-items) had a Cronbach's alpha of .926. Factor 2 (8-items) had a Cronbach alpha of .887. Factor 3 (6-items) had a Cronbach alpha of .836, all of which exceeded the .700 level used for social science research.

## Differences between students

To do comparisons based on individual characteristics of the three facets of religion (Denomination, Frequency, and Intensity), we used analysis of variance (ANOVA). For simplicity, we report only the statistically significant ANOVAs in the table below. A complete statistical report is available from the authors.

**Table 4. ANOVA results, statistically significant in BOLD.**

| | Factor | Mean Square | F | df | Sig. |
|---|---|---|---|---|---|
| **Religious Denomination** | ***CHEAT_SIGNIF*** | **2.539** | **2.628** | **4** | **.039 **** |
| Religious Denomination | *CHEAT_ATTITUDES* | 1.738 | 1.738 | 4 | .142 |
| Religious Denomination | *CHEAT_MINOR* | .453 | .456 | 4 | .768 |
| **Religious Frequency** | ***CHEAT_ATTITUDES*** | **7.485** | **7.843** | **1** | **.006 **** |
| Religious Frequency | *CHEAT_SIGNIF* | .001 | .001 | 1 | .976 |
| Religious Frequency | *CHEAT_MINOR* | .077 | .078 | 1 | .781 |
| Religious Intensity | *CHEAT_SIGNIF* | .243 | .233 | 6 | .965 |
| Religious Intensity | *CHEAT_MINOR* | 1.013 | 1.038 | 6 | .405 |
| **Religious Intensity** | ***CHEAT_ATTITUDES*** | **4.921** | **6.219** | **6** | **<.001 **** |

How should we interpret this result? Simply identifying with a religion (choosing a denomination from a list) had some effect on cheating behavior. However, those who had strong support for a religion (intensity) and those who actively participate in a religion (religious frequency) were higher in academic honesty attitudes, but not higher in behavior. These findings support the different effects of religion from previous studies.

**Table 5. t-Test scores, statistically significant results only**

| | Factor | F | Sig. | t | df | Sig. |
|---|---|---|---|---|---|---|
| Gender | *CHEAT_MINOR* | 2.026 | .157 | 1.439 | 109 | .076 |
| First Generation | *CHEAT_ATTITUDES* | 5.454 | .021 | 1.576 | 108 | .059 |
| Military | *CHEAT_MINOR* | .317 | .575 | 2.329 | 110 | .011 |
| Age | *CHEAT_MINOR* | .080 | .777 | 1.395 | 109 | .082 |
| Employed | *CHEAT_SIGNIF* | 5.546 | .020 | -1.654 | 111 | .050 |

When we examined individual demographic characteristics (gender, age, employment, military experience, and First-Generation status), we found that each of these characteristics were significant in one factor. It is important to note that no one individual characteristic

influenced all three factors. In fact, no individual characteristic influenced more than one factor. This supports the well held belief that all/most students cheat from time to time, and no group is immune to the temptation of cheating. Cheating Attitudes were affected only by First Generation status, and none of the other demographic characteristics. Minor cheating behaviors were affected by three demographic characteristics, gender, military experience, and age. Serious cheating behaviors were affected only by employment. Our sample had too few married students or students with children, making this comparison less robust than we would like.

## CONCLUSION

In conclusion, this project provides evidence that Finnish students cheat just as frequently as other groups. When examining Hypothesis 1, regarding religious denomination of Finnish business majors and their attitudes toward academic dishonesty, we found a significant relationship between denomination and student's attitudes toward academic dishonesty. The results are as hypothesized and are most likely due to the Finnish student's religious beliefs and participation in religious organizations, which is reflected in their attitudes about cheating but not necessarily their behaviors. Although the research provides evidence that many students did not go to church, the strong culture around the Evangelical Lutheran Church of Finland could have some effect on the student attitudes.

Hypothesis 2 proposed that the age of Finnish students would significantly influence their attitudes toward academic dishonesty. Regarding Hypothesis 2, we did not find a significant relationship. We did see that age had a minor impact, along with military experience and gender. Which leads to Hypothesis 3, Finnish female business majors will cheat less than their male counterparts. As seen above, in hypothesis 2, gender was not a primary demographic of impact. This could be due to the smaller sample size or the use of self-measurement. Finnish students may feel comfortable admitting to small infractions, but conscious of the admonition of larger cheating instances.

In conclusion, religion's three factors, denomination, frequency of participation, and intensity of feeling all have significant effects on cheating behaviors. Other demographic characteristics impact the frequency of cheating, supporting the conclusion that cheating behaviors are common among all students.

## IMPLICATIONS FOR FUTHER RESEARCH

One obvious problem with academic ethics research is we are examining the attitudes towards cheating, and self-reported incidents. We have no way to validate these with any objective measure. Students may perceive more cheating or believe they have witnessed cheating when none existed. In addition, students might be hesitant to self-report their own bad behaviors even if done anonymously. As a result, our findings about the pervasiveness of cheating, and all research on academic ethics deserve more scrutiny.

A limitation is the use of non-random sampling, which limits the generalizations that can be made from the findings. Another limitation is that we only examined one institution. This

school might not be representative of all Finnish applied science colleges and does not represent Finnish universities. Another limitation of this study is the sample size. A larger sample size could result in more detailed analysis of the sub-groups. For example, a larger sample size could divide business majors into discipline areas. The same distinctions can be made with religion, as the Finnish population is heavily dominated by the Lutheran Church. Smaller sub-groups (especially married students and students with children) have too few members to make any comparison. More research on academic dishonesty is certainly warranted as we strive to minimize the effects of unethical behaviors.

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**Appendix One. Demographic Survey Questions.**

This is a voluntary research project on student views of academic ethics. The survey should take five to ten minutes to complete. There is no penalty for refusal to participate. You must be at least 18 years old to take this survey. DO NOT PUT YOUR NAME OR IDENTITY NUMBER ON THE SURVEY. ALL ANSWERS ARE ANONYMOUS AND CONFIDENTIAL. If you do not wish to participate, you may hand in the survey form blank. Thank you for your input on this research project. All survey questions are ANONYMOUS.

What year in school are you presently?
Are you male or female?
What is your major/college?
1. Fine Arts 2. Math and Sciences 3. Education 4. Liberal Arts
5. Business 6. Nursing 7. Other
Are you currently employed (this semester)? 1. No 2. Part-time 3. Full-time
Are you married?
What is your age?
How many children do you have?
How would you describe your religious views?
1. Lutheran 2. Catholic 3. Christian 4. Hindu
5. Jewish 6. Buddhist 7. Muslim 8. Not Religious
How would you describe your religious views?
1. Strongly religious 2. Religious 3. Somewhat religious
4. Somewhat non-religious 5. Non-religious 6. Strongly non-religious
How often do you attend church or religious meetings in a month?
Have you served in the military or reserves?

# UNDERSTANDING CONSUMER TRANSCENDENCE AMONG MILLENNIALS: A NEW CONSTRUCT AND SCALE

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## ABSTRACT

*The purpose of this study is to develop a better understanding of Millennials as consumers, specifically, their religiosity, which past research shows affects consumer attitudes toward companies, their products and services. Understanding consumer religiosity facilitates relationship marketing, thereby enabling development of customer loyalty and long-term customer commitment. Public opinion and some research suggest that Millennials are a generation that is individualistic, more nonreligious than earlier generations. In an effort to go beyond the common dichotomous characterizations of "to be or not to be religious or spiritual," a new construct is developed, called "consumer transcendence," which captures more sublime, indirect spiritual views. This exploratory scale of consumer transcendence was developed, using a sample of Millennials, the resulting Consumer Transcendence Scale (CTS) offers a unique research avenue and methodological lens for evaluating complexities of spiritual views. Understanding spiritual or transcendence perspectives is beneficial to effectively market to Millennials and other generational groups.*

*Keywords: Consumer marketing, Religiosity, Transcendence, Millennials, Scale Development*

## INTRODUCTION

Following the reports of news outlets over the past decade (Gabbatt, 2023; Burge, 2019; Grossman, 2015; Lipka, 2015) and research publications (Pew Research Center, 2022, 2015) there seems to be a tendency to label the Millennial generation, or at least a sizeable portion of it, as individualistic (Steffy, 2023; Twenge et al., 2015; Raphelson, 2014), unreligious, and even unspiritual (Pew Research Center, 2022, 2015; Cooper-White, 2015; Leonhardt, 2015; Markoe, 2012). For Millennials, some studies suggest that religion has not even been surrogated by spirituality but rather both have been diminished and somewhat replaced by social and environmental concerns (Downing Chee, 2015; Benderev, 2014). Yet, other studies suggest that Millennials still exhibit significant religiosity (Sharpe, Grossman, Smith, & Smith, 2015).

An important question is as follows: Are Millennials really unspiritual? Or are there more sublime, indirect spiritual views ranking below evident references to the divine? These views are linked to a classic concept, called "transcendence," that has been vividly discussed since ancient times in the realm of philosophy and theology. The purpose of this exploratory study is the

development of a novel consumer transcendence construct as well as the initial validation of a scale to lend credibility to its operationalization ability.

A consumer "transcendence" construct can lead to better understanding of consumer religiosity, thereby facilitating development of customer loyalty and long-term customer commitment, which is part of relationship marketing (Mishra, 2016; Sahi et al., 2018). Transcendence might be utilized as means to delineate attitudes toward products, such as "green" products like organic food. Lacking a transcendence scale in the business literature and the highly convoluted history of transcendence characterized by intricate theological and philosophical debates since ancient times, a novel transcendence scale would provide a useful tool for research. In view of the promising use of a helpful research tool, as well as the ongoing debate regarding characteristics of the Millennial generation, the authors expect that this study will add to the research stream regarding the Millennial generation and relationship marketing.

Having defined the domain, the construct development methodology prescribes the creation of a valid and reliable instrument (Lewis, Templeton & Byrd, 2005). The common provisions for scale development ask for a set of studies composed of at least one exploratory pilot and one follow-up conclusive research study (Gerbing & Anderson, 1988; Churchill Jr, 1979), both of which ideally rely on two separate samples of 500 to 1000 respondents (MacCallum et al., 1999, 2001). This research represents an initial study employing a smaller but nevertheless commonly acceptable sample size (n=107).

This study was driven by the recent call by the literature and journal editors to consider conceptual or empirical research for submission dealing with new constructs, specifically a construct "that is important but has not been considered in our field despite its clear potential for generating new insights" (Deighton et al., 2010, p. vi). Indeed, the contemporary literature encourages a stronger emphasis upon novel conceptual and interdisciplinary approaches as they are considered an indispensable cornerstone for knowledge generation and the renewal of the business disciplines, namely the management field (Alvesson & Sandberg, 2013) and marketing field (Yadav, 2015).

In alignment with MacInnis' framework for conceptual contributions to marketing (MacInnis, 2011), this research has the goal of "envisioning" a novel perspective – here upon the analysis of Millennials - by introducing an new construct to the business literature (MacInnis, 2011, p. 136, 143). The term transcendence has been utilized in the business literature before but, as will be shown below, with a different accent and within a different context.

Some of the ongoing debates about the Millennial generation seem to be somewhat one-sided. The Pew Research Center characterizes Millennials as very likely to identify as "nones", i.e. "atheists or agnostics, or that their religion is "nothing in particular" (Lipka, 2015). Instead of the dichotomous dispute whether Millennials are religious, spiritual or rather "nones," this study proposes an alternative approach: both religiously or spiritually inclined as well as disinclined Millennials (and also members of other generations) could be influenced by transcendent views. To the authors' knowledge "consumer transcendence" has not been considered yet in the business literature.

## THEORETICAL BACKGROUND: THE TRANSCENDENCE CONSTRUCT

Transcendence is derived from the Latin word *transcendere* meaning "to surpass, step over, to cross over to. Thus *transcendence* means the surpassing, the "going beyond." The term transcendence has been utilized in the business literature before but with an emphasis distinct

from the notion of consumer transcendence employed in this research. The two prominent areas in which the term transcendence occurs in the business literature are in the context of Maslow's hierarchy of needs and in discussions dealing with self-transcendence as a personality trait (Maslow, 1943).

## Consumer transcendence

There have been multiple studies regarding the relationship between religiosity and marketing. One study found that a person's religiosity has a moderating effect on consumer skepticism and satisfaction. Religiosity lowers skepticism and enhances satisfaction, improving patronage intention (Deb et al., 2021). Modern businesses, "in efforts to embrace diversity, accommodate cultural factors such as religiosity, particularly so in multinational operations where diverse religions will be encountered" (Russell et al., 2023, p. 394). Higher levels of religiosity, specifically Judeo-Christian ethicality, were found to be significantly related to a more sustainable business culture, specifically, higher economic activity, more economic freedom, better social progress, lower corruption, and improved gender equality (Russell et al., 2023).

Moral virtues inherent in religiosity, such as Judeo-Christian ethicality, provide society with a foundation of trust in which business activity can flourish (cf., Basu and Miroshnik (2021); Joines (2019); Mele and Fontrodona (2017). In a study of consumers, those with higher religiosity were more trusting of things they cannot see, which included AI applications such as chatbots. This trusting nature leads to a greater trust in brands (Minton et al., 2022). Research regarding transcendence also encompasses the tourism industry. People visit tourist destinations in natural surroundings as a means for experiencing transcendence (Wang et al., 2023). Research has shown that spiritual beliefs impact a consumer's behavior and needs (Arli & Tjiptono 2022).

Maslow's eminent model is based on the rationale of "pre-potency" (Maslow, 1943, p. 22, 23) which means that it is indispensable for lower need levels to be satisfied before humans consider striving for the satisfaction of higher level needs. Needs at the bottom of the pyramid are physiological in nature, namely food and water. Once these needs are satisfied, humans seek safety (physical, economic, and mental comfort), belonging (social, family), esteem (respect for other people and entities) and self-actualization (desire to reach one's full potential) (Maslow, 1967). In his original work and for most of his lifetime Maslow positioned self-actualization at the peak of the hierarchy of needs. Interestingly, the 1946 edition of Maslow's book displays the pyramid model encompassing the aforementioned five types of needs, whereas the cover of the 2013 edition only shows a mountain peak labeled self-actualization, offering eloquent visual testimony for the ultimate role Maslow ascribed to it.

A year before his death, Maslow proposed self-transcendence to be added as a factor ranked above self-actualization (Maslow, 1969). The original five "need" categories are characterized by a strong ego-centered undercurrent: I need food, I need shelter, I need the "feeling of being liked or loved" (Maslow 2013, p. 30), I need to be what I can be (Maslow, 2013). In contrast, Maslow described self-transcendence as "the striving for identity, meaning, and purpose *beyond the self*" (Myers, 2011, p. 301; emphasis added by authors). In the book in which he proposed self-transcendence, Maslow focused upon justifying transcendence as not being contrary to scientific thought but accentuating the altruistic gist of self-transcendence.

Maslow neither sought to provide an operational construct for transcendence nor did he offer particular suggestions for measurement (Primeaux & Vega, 2002). Self-transcendence

rather appears as a later afterthought to his foundational model. This is also why self-transcendence with its altruistic tendency does not quite seamlessly fits into the overall model. Perhaps it is due to this "odd ball" status of self-transcendence, many undergraduate business books leave it out when they cover Maslow's pyramid (Cf., Kerin and Hartley, 2016).

This study extends Maslow's work regarding transcendence. First, this research aims to develop a sufficiently contoured and thus operational construct. Secondly, transcendence is expressly devised as a consumer attitude. Consequently, transcendence relates to general holistic, altruistic notions but also stands for an attitude integrating respectful, empathetic perceptions towards nature as well as the environment and to views about products (and potentially also organizations). Thirdly, unlike Maslow's approach, the transcendence construct was developed against the backdrop of classic philosophy.

The expression self-transcendence is also applied as a personality trait (Haase et al., 1992). In psychological terms self-transcendence is a component of the transpersonal. As such it is used in conjunction with "non-ordinary states of consciousness" (Corsini, 1999, p. 1018). Although a uniform definition does not exist, the various approaches to (self-) transcendence show common characteristics: on the one hand, the term reflects the interaction between patients and their caregivers, the patient perspective as well as altruistic endeavors on behalf of the caregiver. Self-transcendence is used from a psychiatric point of view. In this manner it refers in general to patient spirituality and well-being (Gaskamp, & Meraviglia, 2006) and specifically to potentially pathological states that e.g. may be linked to cases of losing touch to reality such as extrasensory perception (spiritual acceptance), feeling connected to the universe (transpersonal identification) and losing oneself in an experience (self-forgetfulness) (Huguelet & Koenig, 2009). In this study, transcendence is not conceptualized as a personality trait but as a type of consumer view, ranking below direct references to the spiritual or religious.

## The transcendentals

In view of the multitude of complex contexts, the term "transcendent" has been utilized in philosophy, theology and other areas, the construct was identified in light of the traditional triad of beauty, goodness and truth. These transcendentals have been sufficiently contoured by ancient Greek, medieval scholastic and classic modern philosophy, namely Aristotle, Plato, Socrates, Thomas Aquinas, and Immanuel Kant. Modernist, often eclectic and hard to profile perspectives on transcendence, such as far-eastern spirituality and New Age did not become part of the construct building. However, the works of prominent modern scholars like Peter Kreeft and highly esteemed writers such as C.S Lewis and G.K. Chesterton, which are known for their appreciation for traditional and classic modern philosophy, were reviewed and catalyzed both construct development and operationalization (Cf., Kreeft, 2009, 2016, Lewis, 2002, 2004, Chesterton, 1986, 2006).

Based on the cited literature it can be stated: all human beings naturally long for beauty, goodness and truth. These transcendentals are inextricably intertwined phenomena that are perceivable by every human being. According to Kreeft (2016) and others, the search for beauty, goodness and truth represents the imprint of the divine creator in everything that exists, including the discerning human. Although not a direct manifestation of the divine, notions such as the appreciation of selflessness, the longing for justice (goodness), the appeal of rational arguments (truth) and the feelings beauty elicits are all reflections of the divine being the absolute goodness, beauty and truth (Brand, 2015).

Transcendence is differentiated from religion by characterizing it as lacking a direct reference to the divine. Once the divine is added, one enters the religious realm. In this sense transcendence is a necessary but insufficient condition for religious thought, i.e. a spirituality expressly implicating the existence of God. Furthermore, transcendence does not revolve around the individual but expresses relations to others and nature (Feder, 2010).

The transcendence construct was shaped utilizing the Daily Spiritual Experience Scale (DSES) as a contrasting benchmark. Contrary, to what has been claimed about the DSES, this scale does not per se measure the "relationship with the transcendent" (Underwood, 2011, p. 45). The CTS measures are distinct from religious notions albeit related to spirituality, but tendentiously more in a figurative sense, whereas the DSES more straight-forwardly refers to religious experiences expressing relationships between individuals and God.

## METHODOLOGY

After the literature review, a summary of relevant articles and themes was devised. Topics were prudently left out that appeared too unspecific to be of little help for item generation. The remaining information then served to compile a series of item drafts that were continuously reviewed in light of the transcendence construct. For instance, the book title "Natural Swimming Pools: Inspirations for Harmony with Nature" (Littlewood, 2005) led to inclusion of the item "Certified organic food production is in harmony with nature".

Articles and themes were omitted that appeared too unspecific or of little help for item generation. However, the original plan to ignore direct relations between nature and spirituality for the data collection instrument was modified: since quite a few authors have pointed to the interplay between (neo-) pantheism and secularization in Western countries against the backdrop of the emergence the green movement (Dobel, 2005; Shipton, Coetzee & Takeuchi, 2013) and in context with green consumption including organic food production (Radkau, 2014; Tokar, 2008), it was decided to add some survey items as control measures reflecting concepts of pantheism.

This process led to a tentative list of 80 items. As a rule of thumb, the literature commonly recommends the generation of an initial item pool that should consists of about three times the number of items to be eventually utilized in the final scale (MacCallum et al., 2001). This process resulted in 23 items. Hence, this prerequisite was met. Subsequently, an in-depth interview with a professional in theology holding a graduate degree in Catholic theology was conducted to refine the set of measures. To facilitate a multi-perspective analysis, the items were later reviewed and checked for face validity by a panel of business faculty from different disciplines. In addition, a group of business undergraduate students attending a junior-level marketing research class were tasked to check the items for redundancy and comprehensibility.

All items were devised as 5-point Likert scales (anchored at 1 = "strongly disagree" and 5 = "strongly agree"). A pretest in a marketing class ensued and resulted in the elimination of four items regarded as unduly pantheistic ("I worship nature", "Nature is God," and "Certified organic food production respects the divinity of nature") or strong religious connotations ("I appreciate certified organic food because I am a spiritual person"). The 23-item scale was then subjected to scale purification utilizing the data generated by this study.

## Sample Selection

To obtain data for the study, a self-administered online survey was devised and disseminated among college students in 2014. Qualtrics served as the survey playform. Students taking classes at a Midwestern US university were identified as a suitable population. The birth year span for Millennials is typically 1981 to 1996 (Smith, 2011). The sample consisted of 107 respondents born between these years and members of the same demographic cohort known as Generation Y or Millennials. The expectation is that members of this group share common characteristics per generational theory established by prior research (Howe & Strauss, 2009). The ratio between the sexes was somewhat skewed toward female respondents: males: 34.6%; females: 65.4%. Data were analyzed employing SPSS 19.0.

## Common Method Bias

A customary procedure is to probe survey data for potential common method bias (Field, 2013). Common method bias represents variance that cannot be attributed to the operationalized constructs but to the method of measurement (Podsakoff et al., 2003). The transcendence items were included in an unrotated factor analysis in SPSS with a forced extraction to only one single factor. If the unrotated factor analysis indicates that less than 50% of the variance stem from one item (component), then there is no significant level of common method bias. The results for this research were 28.99% and thus contraindicative for common method bias.

## Skewness and Kurtosis

All items and aggregate values were scrutinized for skewness and kurtosis. In terms of kurtosis, 20 values were found to be approximately normal or excellent, three acceptable and one suboptimal. The results are overall acceptable considering firstly, skewness values are all within approximately normal or excellent (twenty-two) and acceptable (two values) range, and secondly, kurtosis is susceptible to sample size (Field, 2013).

## One Sample T-Test

One sample t-tests were performed on the 23 transcendence items and 11 DSES items to analyze if responses to the survey items were different from “3”, representing the neutral point on the 5-point Likert scale. The results provided in Table 1 indicate generally significant values. However, insignificance existed for transcendence item #16 (“Buying certified organic food shows respect for nature”) and item #18 (“Certified organic food production is in harmony with nature). Although items #16 and #18 rendered suboptimal results, their values nevertheless exceeded 3.0. In view of the exploratory nature of the study it seemed justifiable to retain these items.

**Table 1: One Sample T-Test Results**

| | | Test Value = 3 | | |
|---|---|---|---|---|
| | Transcendence items | M | t | Sig. (2-tailed) |
| 1 | Nature gives meaning to life | 3.67 | 7.256 | .000* |
| 2 | Nature is holy | 3.47 | 4.819 | .000* |
| 3 | Nature is spiritual | 3.30 | 2.902 | .005* |
| 4 | I experience a connection to all of life. | 3.35 | 3.643 | .000* |
| 5 | I am spiritually touched by the beauty of nat. | 3.41 | 3.999 | .000* |
| 6 | We should treat nature with respect | 4.29 | 16.905 | .000* |
| 7 | Nature goes beyond what we can see | 3.97 | 12.292 | .000* |
| 8 | Nature is more than we can comprehend | 3.74 | 7.837 | .000* |
| 9 | There are invisible aspects of nature we depend on | 3.83 | 9.725 | .000* |
| 10 | There are invisible elements of nature our visible world rests on | 3.83 | 9.725 | .000* |
| 11 | The state of the environment makes me sometimes feel sad | 3.71 | 7.886 | .000* |
| 12 | The state of the environment makes me sometimes feel guilty | 3.81 | 9.114 | .000* |
| 13 | I feel a selfless caring for others. | 3.71 | 7.278 | .000* |
| 14 | Buying COF[2] is an expression of one's concern for nature | 3.56 | 5.685 | .000* |
| 15 | Buying COF shows respect for nature | 3.12 | 1.165 | .247 [1] |
| 16 | COF production fits nature's good & beauty | 3.24 | 2.541 | .012** |
| 17 | COF production is in harmony with nature | 3.12 | 1.184 | .239 [1] |
| 18 | COF production helps to preserve nature's balance | 3.29 | 3.149 | .002* |
| 19 | COF production helps to protect "mother earth" | 3.33 | 3.423 | .001* |
| 20 | Buying COF means to preserve the beauty of nature | 3.21 | 2.223 | .028** |
| 21 | Nature is more than meets the eye | 4.03 | 14.512 | .000* |
| 22 | It is reasonable to say we cannot really control nature | 3.84 | 8.857 | .000* |
| 23 | It is irrational to think we can really control nature | 3.74 | 7.760 | .000* |
| | DSES | | | |
| 1 | I am religious. | 3.56 | 4.549 | .000* |
| 2 | I worship frequently (usually once a week or more). | 3.34 | 2.687 | .008* |
| 3 | The most important thing in my life is faith in God. | 3.39 | 3.174 | .002* |
| 4 | I find strength in my religion or spirituality. | 3.81 | 7.706 | .000* |
| 5 | I feel God's love for me directly. | 3.66 | 5.851 | .000* |
| 6 | I feel God's love for me through others. | 3.66 | 6.107 | .000* |
| 7 | I feel deep inner peace or harmony. | 3.51 | 6.249 | .000* |
| 8 | I desire to be closer to God or in union with the divine | 3.71 | 6.095 | .000* |
| 9 | I find comfort in my religion or spirituality | 3.79 | 7.164 | .000* |
| 10 | I see God's power reflected in nature | 3.93 | 8.645 | .000* |
| 11 | I see nature as a visible sign pointing to the divine | 3.52 | 5.500 | .000* |

***Notes*:**

Significance levels: *$p \leq 0.01$ **$p \leq 0.05$

[1] Although items #15 and 17 rendered suboptimal results, their values nevertheless exceeded 3.0. In view of the exploratory nature of the study these items were retained.

[2] COF = certified organic food

## Internal consistency of the transcendence scale

Table 2 shows the inter-item correlations for all 23 items. None of the inter-item correlations exceed 0.85 being contraindicative for multicollinearity (Kline, 2011). Out of 276 unique correlations (i.e. without the 1.0 diagonal values) only 27 rendered insignificant results. A high alpha of 0.925 implied a high average inter-item correlation and thus strong reliability. A look at the item-total statistics showed that deletion of any of the 23 items would not lead to any significant increase in reliability. The corrected item-total correlations (benchmarks: ≥0.4 (Ware & Gandek, 1998) or ≥0.3 (Nunnally & Bernstein, 1994)) rendered suboptimal results for items# 23 and 24. But since their deletion would not benefit the alpha value, their results seemed acceptable.

**Table 2: Transcendence scale - Item total statistics**

| | Item-Total Statistics | | | | |
|---|---|---|---|---|---|
| | | | Cronbach's α = 0.925 | | |
| | | Item-Total Correlation[1] | Cronbach's α if Item Deleted [2] | Difference | Assessment |
| 1 | Nature gives meaning to life | 0.7 | 0.921 | -0.004 | |
| 2 | Nature is holy | 0.5 | 0.923 | -0.002 | |
| 3 | Nature is spiritual | 0.7 | 0.920 | -0.005 | |
| 4 | I experience a connection to all of life. | 0.5 | 0.924 | -0.001 | |
| 5 | I am spiritually touched by the beauty of nature | 0.6 | 0.922 | -0.003 | |
| 6 | We should treat nature with respect | 0.5 | 0.923 | -0.002 | |
| 7 | Nature goes beyond what we can see | 0.5 | 0.923 | -0.002 | |
| 8 | Nature is more than we can comprehend | 0.6 | 0.922 | -0.003 | |
| 9 | There are invisible aspects of nature we depend on | 0.5 | 0.923 | -0.002 | |
| 10 | There are invisible elements of nature our visible world rests on | 0.6 | 0.921 | -0.004 | |
| 11 | The state of the environment makes me sometimes feel sad | 0.6 | 0.922 | -0.003 | Small decrease, i.e. items warrant the current level of reliability |
| 12 | The state of the environment makes me sometimes feel guilty | 0.5 | 0.923 | -0.002 | |
| 13 | I feel a selfless caring for others. | 0.5 | 0.924 | -0.001 | |
| 14 | Buying COF [3] is an expression of one's concern for nature | 0.7 | 0.921 | -0.004 | |
| 15 | Buying COF shows respect for nature | 0.7 | 0.920 | -0.005 | |
| 16 | COF production fits nature's good & beauty | 0.7 | 0.920 | -0.005 | |
| 17 | COF production is in harmony with nat. | 0.5 | 0.923 | -0.002 | |
| 18 | COF production helps to preserve nature's balance | 0.6 | 0.922 | -0.003 | |
| 19 | COF production helps to protect "mother earth" | 0.7 | 0.921 | -0.004 | |
| 20 | Buying COF means to preserve the beauty of nature | 0.7 | 0.921 | -0.004 | |
| 21 | Nature is more than meets the eye | 0.6 | 0.923 | -0.002 | |
| 22 | It is reasonable to say we cannot really control nature | 0.3 | 0.926 | 0.001 | Negligible increase does not give cause to delete the items |
| 23 | It is irrational to think we can really control nature | 0.3 | 0.926 | 0.001 | |

***Notes:***
[1] Benchmarks: ≥0.4 (Ware & Gandek, 1998) or ≥0.3 (Nunnally & Bernstein, 1994); higher values are desirable. Suboptimal results for item # 23 and 24. But since their deletion would not benefit the alpha value, their results seem acceptable.
[2] Deletion does not lead to any significant increase in reliability. [3] COF = certified organic food

## Consumer Transcendence Scale (CTS)

The Consumer Transcendence Scale (CTS) had been established as a scale of 23 items, as shown in Table 3. The scale is composed of five closely intertwined facets that have been labeled "beauty, awe & inter-connected-ness with nature" (5 items), "Invisible facets of nature" (6

items), "Empathy- altruism & nature" (3 items), "Product preference & nature" (7 items). Although the analysis spoke against higher order factors, the 5 dimensions can at least descriptively be subsumed under the classic triad of the transcendentals beauty (aesthetical, emotional; factor 1 and 2), goodness (good deeds, compassion; factor 3 and 4) and truth (reason, intellect; factor 5).

**Table 3: Consumer Transcendence Scale (CTS)**

| Item # | Tran-scen-dentals | Scale Dimen-sions | Scale Items [1] |
|---|---|---|---|
| 1 | **Beauty** (aesthetical, emotional) | Beauty, awe & inter-connected-ness with nature (5 items) | Nature gives meaning to life. |
| 2 | | | Nature is holy. |
| 3 | | | Nature. is spiritual. |
| 4 | | | I experience a connection to all of life. |
| 5 | | | I am spiritually touched by the beauty of nature. |
| 6 | | Invisible facets of nature (6 items) | We should treat nature with respect. |
| 7 | | | Nature goes beyond what we can see. |
| 8 | | | Nature is more than we can comprehend. |
| 9 | | | There are invisible aspects of nature we depend on. |
| 10 | | | Nature is more than meets the eye. |
| 11 | | | There are invisible elements of nature our visible world rests on. |
| 12 | **Goodness** (good deeds, compassion) | Empathy-altruism & nature (3 items) | The state of the environment makes me sometimes feel sad. |
| 13 | | | The state of the environment makes me sometimes feel guilty. |
| 14 | | | I feel a selfless caring for others. |
| 15 | | Product preference & nature (7 items) | Buying _ [product x] _ is an expression of one's concern for nature. |
| 16 | | | Buying _ [product x] _ shows respect for nature. |
| 17 | | | _ [Product x/ Production of product x] _ fits nature's good & beauty. |
| 18 | | | _ [Product x/ Production of product x] _ is in harmony with nature. |
| 19 | | | _ [Product x/ Production of product x] _ helps to preserve nature's balance. |
| 20 | | | _ [Product/ Production of product x] _ helps to protect "mother earth". |
| 21 | | | Buying _ [product] _ means to preserve the beauty of nature. |
| 22 | **Truth** (reason, intellect) | Nature is arcane & unknowable (3 items) | It is reasonable to say we cannot really control nature. |
| 23 | | | It is irrational to think we can really control nature. |

5-point Likert items, anchored at "strongly disagree" and "strongly agree"; middle point: "neither agree nor disagree".

***Notes:***

It is hypothesized one could also employ the following expressions for:
Item # 15 and 16: _[Product x from organization xyz]_
Item # 17-20:_[Product x from organization xyz]_

[1] The scale is preliminary and will be subject of a future conclusive study with a larger sample.

The outcomes of the analyses neither distilled more distinctive first order factors nor indicated the existence of higher order factors, but this is not problematic for the CTS scale. On the contrary, it fully matches the philosophical and religious tradition of goodness, beauty and truth as indistinguishable elements of one unified entity that finds its expression in everything that "is", in religious terms: God.

Based on the one sample t-test results mentioned before (shown earlier in Table 1), all but two of the 23 items showed means that were significantly higher than "3", i.e. the "neutral" scale point. The only two measures that did not render significant results nevertheless exceeded the neutral mark ("Buying certified organic food shows respect for nature", M=3.12, $p$=0.247; "Certified organic food production is in harmony with nature"; M=3.12, $p$=0.239). Especially noteworthy are the positive results for the CTS variables "I feel a selfless caring for others" (M=3.71, $p\leq0.01$) and "I experience a connection to all of life" (M=3.35, $p\leq0.01$). The composite scores for CTS (M=3.56, $p\leq0.01$) and DSES revised (M=3.64, $p\leq0.05$) were significantly higher than the neutral point.

## CONCLUSIONS

While some prior research shows that Millennials are a generation that is individualistic, unreligious or unspiritual. Going beyond the common dichotomous characterizations of "to be or not to be religious and/or spiritual," this study advanced a new related but different construct, called "consumer transcendence," to capture more sublime, indirect spiritual views. Using a sample of Millennials, an exploratory scale was developed, the Consumer Transcendence Scale (CTS). The CTS was tested via exploratory factor analysis (EFA). Findings indicate that transcendence can be demarcated from measures of evident spirituality and religiosity.

Results of this study indicate that the sample of Millennials lean both toward transcendence as well as religious spirituality. Transcendence is conceptualized as tending to be group-centered and altruistic. The findings indicate that Millennials as a whole do not fit the common characterization as being individualistic and egocentric. In fact, Millennials tend to be concerned about others in society, as well as concerned about social issues. In fact Millennials on average are transcendent/spiritual and are not so individualistic and egocentric as some past studies suggest.

The Consumer Transcendence Scale offers a promising research avenue and methodological lens for evaluating complexities of the indirect spiritual views of the millennial generation. Such views affect how goods and services, and the companies that provide them, are regarded by Millennials. Understanding Millennials' views is essential to carry out effectively relationship marketing to this very large market segment.

## LIMITATIONS AND FUTURE RESEARCH

The techniques presented in this study have inherent limitations because they are exploratory in nature. For the analysis in this study, the sample was sufficient, but a future study might incorporate a larger a sample size, which would facilitate confirmatory factor analysis (Norušis, 2012; Comrey & Lee, 1992). Future research could examine in detail the differences between transcendent and ethical consumer attitudes. Transcendence is regarded as more precise than general ethical notions. Future research can use the scale developed in this study to measure the transcendence levels of different people groups, such as students, general public, or other

group, which might be analyzed demographically, such as by gender, age, or other demographic. Future research could help clarify exactly how transcendence differs from general ethical notions.

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# THE "AMERICAN DREAM" AND COLLEGE STUDENTS' ATTITUDES TOWARDS MATERIALISM

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## ABSTRACT

*This paper explores the concern that the "American Dream" is in peril due to modern college student's interest in material gain and security often at the expense of personal, moral, and societal well-being. We investigate materialistic values and affective states of business and non- business students. We found differences between the groups on several facets of materialism. We also found that across both groups higher levels of acquisition as the pursuit of happiness were associated with negative affective states and lower levels of acquisition as the pursuit of happiness were associated with positive affective states. Our conclusion is that de-emphasizing the importance of acquisition of possessions will increase overall life satisfaction and help achieve "The American Dream".*

Keywords: *materialism, positive and negative affect, success, business programs*

## INTRODUCTION

In his 1931 book, "The Epic of America", James Truslow Adams popularized the phrase "American Dream" (Adams, 1931). He was concerned that America had forgotten the ideals that it was founded on and was more concerned with material gain (Churchwell, 2018). About the American Dream he said "It is not a dream of motor cars and high wages merely, but a dream of social order in which each man and each woman shall be able to attain to the fullest stature of which they are innately capable, and be recognized by others for what they are, regardless of the fortuitous circumstances of birth or position." (Adams, 1931). Nearly a century later, we echo the concern that the American Dream is threatened by the pursuit of material gain and security often at the expense of personal, moral, and societal well-being. This has been partially reflected in the growing popularity of business programs as reliable and apparent venues to materialistic gains and allegedly to career success and happiness. Colleges and universities will confer approximately 390,600 business degrees annually (National Center for Education Statistics, 2021) making business the most popular undergraduate major (21%), distantly followed by social sciences (160,600), engineering (126,700), biological and biomedical sciences (121,200), and psychology (116,500).

Further contributing to this trend, graduating MBAs and various masters programs in business outpaced previously top-ranked graduate education for the first time in 2013, resulting

in 187,000 conferred degrees (2020), followed by education (146,000), and health related professions (119,000). Yet, in spite of this seeming success and the draw to business schools, not all has been well for business students. Somewhat contrary to an anticipated and foundational college outcome, given the recent popularity of business programs, the Gallup-Purdue Web Survey (2014) of 29,560 college graduates revealed that business students were the least deeply interested in their work with only 38% of business graduates indicated they were engaged compared to students in the arts and humanities (43%), sciences and engineering (43%), and social sciences and education (47%). Some researchers maintain that a business school environment should explicitly encourage materialistic values (Wong & Ahuvia, 1998).

Numerous past studies have pointed towards materialism as an extrinsic motivator for business students and also as one possible source of work disappointment (Kasser & Ahuvia, 2002). Some have argued that this is the result of business schools advocating materialistic greed in the form of profit and the acquisition of wealth (Giacalone & Wargo, 2009). In addition, the effects of a shifting economy and the drive towards shareholder wealth, specifically both corporate profit maximization and the drive towards individual wealth accumulation as taught in business schools are central to personal materiality goals and may be coming at the expense of well-being. Little attention has been given to examining student happiness and well-being which in many cases may be inconsistent with the realities of the emerging economic environment. Couple this with the rising cost of higher education, there is mounting concentration by federal and state governments, college administration, parents, and students to view a high paying position as the main purpose of higher education as opposed to personal well-being, civic or environmental responsibility (Senter & Spalter-Roth, 2020). The vocational focus on high paying positions is also contradictory to those that advocate that the purpose of higher education is to enlighten the citizenry through broad liberal arts.

Given the scope and extent of recent societal changes, it is important to understand the direction of business and liberal arts student's orientations towards materialism and well-being. From an education perspective, this leads to a larger fundamental question: What is the purpose of both management education and liberal arts given the increasingly competitive nature of career entry and direction? Past research has shown that the drive towards shareholder wealth and individual material gains are still central in most business programs. These come at the expense of other stakeholder interests, addressing societal issues and personal well-being creating a critical challenge in our lifetime and that of future generations (Bergman, Westerman, Bergman, Westerman & Daly, 2014). We might also question the extent to which liberal arts students are also responding to the competitive work environment, focused career direction and the associated needs for security and material possession.

## MATERIALISM

Materialism has long been a popular, if not controversial, topic for social scientists, public policy architects, educators, consumer behaviorists, and business theorists (Ahuvia & Wong, 1995; Dingus, 2014). Materialism has become a central drive across modern society due to changing social norms, acknowledgment of scarce resources, need for psychological coping

mechanisms and changing individual motivations (Duh, 2015; Kasser, Rosenblum, Sameroff, Deci, Niemiec, Ryan, Árnadóttir, Bond, Dittmar, Dungan, & Hawks, 2014). Research has shown that materialists place a high value on the accumulation of possessions whether in objects, land, or mementos of intangible events to be admired by others (McCardle & Speck, 2019; Richins & Dawson, 1992; Zarco, 2014). However, numerous empirical studies have shown that high levels of materialism are negatively correlated with happiness and well-being (Belk, 1988, 1985; Karabati & Cemalcilar, 2010; Kasser & Ahuvia, 2002; Kasser & Ryan, 1993; Richins & Dawson, 1992; Srivastava, Locke & Bartol, 2001; Vansteenkiste, Duriez, Simons & Soenens, 2006).

Materialism may be likened to the drive towards lower order needs such as safety and physical comfort over higher order needs for belonging, esteem, achievement and quality of life. It may not be that materialistic individuals are not interested in higher order needs, but that the pursuit of material possessions may overshadow one's personal investment in less quantifiable self-actualization goals regarding family, relationships, and community (Belk, 1985; Kasser & Ryan, 1993; Richins, 1987). The negative consequence of the pursuit of materialism at this level is its potential failure to deliver on the anticipated states of happiness and well-being. Thus, we have to question whether possession of goods can lead towards anticipated happiness, and to what extent. If the focus is on accumulation as an end state, materialists may minimalize or bypass opportunities for happiness that could be derived along the way. Ample research has shown that materialism has a negative effect on both happiness and satisfaction with life as a whole (Belk, 1985; Kasser & Kanner, 2004; Wright & Larsen, 1993).

Further, materialism was found to be negatively related to satisfaction with income or standard of living ($r = -.39$) and weakest for satisfaction with family life ($r = -.17$)." Correlations for life satisfaction overall ($r = -.32$), fun ($r = -.34$), and friends ($r = -.3$) were all negative at $p < .01$ (Richins & Dawson;1992). However, it is not clear which way the causation runs or if there are trigger points piloting the correlation to turn negative. We might ask if materialists are not happy because the sacrifices required to accumulate possessions ultimately outweighs the benefits or, perhaps, because people who are largely unhappy overall seek to regain balance through the physical evidence of acquisitions.

The origins of materialism have generally focused on two different convergent perspectives, with roots in different disciplines. The first is based upon consumer behavior and the effects of mass media to direct the "appropriateness" of consumption (Belk, 1985; Pollay, 1986). The second is shaped by sociological thought and the subjective influence of abundance or deprivation within society over time (Inglehart, 1990; Inglehart & Abrahmson, 1994). Here the researchers argue that there is a macro shift toward post- materialism, that is, a de-emphasis on material interests and an awakening of social values. This is somewhat similar to Maslow's (1954) higher order needs such as belonging, quality of life, freedom of expression, community and genuine self-actualization, and in line with Herzberg's (1964) motivating factors, which include achievement, recognition, responsibility, advancement and growth.

Inglehart (1990) later noted two developmental influences: scarcity and socialization. The socioeconomic status attached to an individual subjectively may influence their values. For example, if desired items are in short supply, those who can't obtain them place a greater value

on the items than those who may have them in abundance. Therefore, those who may have been raised in economic hardship may place higher value on material goods than those coming from more affluent environments. Developmental psychology, which functions at the individual level, maintains that value systems are developed during pre-adult years and are generally stable over time (Inglehart, 1990), and children may be directly or inadvertently socialized towards feelings of scarcity or abundance that remain throughout adulthood. However, formative security is not bound to social class providing an opportunity to instill either post-material or material values on a subjective basis more closely tied to one's family orientation (Inglehart, 1990). Nonetheless, as either short or long-term scarcity or limited resources come into play, such as gasoline rationing, individuals dependent upon the resource will likely adjust their values from higher order fulfillment to materialistic needs. This may explain, for example, why those brought up in a secure and abundant environment and display a strong disposition and sensitivity for post-material values, will often be influenced by the scarcity doctrine and will act accordingly.

## MATERIALISM AS A PERSONALITY TRAIT OR CORE VALUE

There are two significant theoretical constructs utilized to understand the drive towards materialism. First, materialism can be approached from a behavioral trait or personality perspective which includes envy, non-generosity, possessiveness, (Belk, 1985) and preservation which was later added as a fourth trait (Ger & Belk, 1993). Of special interest to this study is the concept of "non-generosity" which is defined as a specific reluctance to share possessions, and a broad negative view of supporting charity. This may have implications for college students within and across disciplines, on their perspectives on interpersonal relationships, social responsibility, and environmental sustainability.

An alternative personality trait theory, a second viewpoint in understanding materialism is based upon values, i.e., enduring or generally stable learned beliefs based upon accumulated life experiences which define one's life goals and reflect what is most important to them (Lusk & Oliver, 1974; Richins & Dawson, 1992; Ahuvia & Wong, 2002). These learned beliefs lead to the centralization of acquisition as a prerequisite for happiness. Materialists then believe that success may be measured by the things that people accumulate. Social constructionists would argue that material goods are emblems of identity which are interpreted according to social norms or constructions. These material representations are viewed as operating on a social level such as position status, gender, age, group affiliations, or values. Thus, the materialism construct is subject to environmental surroundings which differ by time and place, or culture as a reflection of a normative ethical relativism. Our study will explore current college student views on materialism to better understand the influence of recent societal changes on material orientation.

## MATERIALISM AND WELL-BEING AMONG COLLEGE STUDENTS

Well-being is furthered when aspirations for self-acceptance, affiliation and community are more central to individuals; and that this pattern is reversed for those with highly centralized needs for financial success (Jiang, Song, Ke, Wang & Liu, 2016). It has been shown that

business students are more materialistic, show greater signs of distress and depression, have lower levels of well-being and greater substance abuse than other students, perhaps due to different value associations (Kasser, & Ahuvia, 2002; Yu & Levesque-Bristol, 2018). Business students place greater value on extrinsic values, wealth accumulation and personal financial success than other students (Robak, Chiffriller & Zappone, 2007), for example education students who placed more emphasis on helping others in need (Vansteenkiste et al., 2006). Other have argued that extrinsic orientations for material possessions, notoriety, and appearance often result in numerous personal comparisons that heighten one's awareness to both strengths and weaknesses leaving self-esteem more volatile (Kasser & Ahuvia, 2002). Business students also displayed greater levels of motivation to make money than psychology students, but also displayed higher levels of anger and depression (Robak et al., 2007). Business students also display greater tendencies for financial compensation than other majors and show greater negative affect (Nagpaul & Pang, 2017; Robak et al., 2007). Interestingly, these negative outcomes were further exacerbated by MBA programs (Bergman et al., 2014).

A strong central focus on financial success also hampered movement towards self-actualization and led to higher levels of angst, lower levels of energy and a need for greater control (Kasser & Ryan, 1993; Vansteenkiste et al., 2006). These students engage less in intrinsically oriented activities that would generally satisfy psychological drives for autonomy and competency, and hence, they miss opportunities that support well-being. The strength of the drive towards extrinsic rewards appears to replace important psychological need-sustaining activities found in more prosocial behavior. Several studies also found positive relationships between business students' extrinsic values and the use of cigarettes and alcohol (Vansteenkiste et al., 2006). This may be construed as a form of self-medication utilized to lessen the effects of minor need-satisfying outcomes in the students' pursuit of extrinsic values. This pattern is consistent with humanistic psychology that postulates that a focus on extrinsic rewards or external affirmation for social recognition raises levels of distress and lowers feeling of well-being (Deci & Ryan, 1987). This may be partially explained by the loss of self-determination as one gravitates from intrinsic to extrinsic reward systems (Robak et al., 2007). Thus, a strong internalized material goods orientation hinders one's ability towards self-actualization.

An alternative insight is provided by other researchers who postulate that the link between values and well-being is strengthened when one's views are congruent with the atmosphere in which they operate. Feelings of well-being are derived from the encouragement and reinforcing similarity of the surrounding environment and opportunity to reach one's goals. Thus, well-being is not so much a function of the content of the value base, but rather a reflection upon the suitability or fit between the individual and the environment. We would expect a positive relationship between well-being and environmental congruence that emphasizes the importance of similarly held beliefs or values (Meglino, Ravlin & Adkins, 1989; Sagiv & Schwartz, 2000). Thus, business students working an in atmosphere of more extrinsic values should likely find their materialistic values positively related to well-being. Additional studies, however, appear to report findings that support negative linkages between extrinsic motivators and well-being. For example, Kasser and Ahuvia (2002) reported that among a sample of business students from Singapore extrinsic values were negatively related to self-actualization

and happiness and positively related to anxiety and health issues. In another study an impact analysis after a 2-year program revealed a focus on maximizing shareholder value and a decrease in customer and employee interests (Williams, Barrett & Bradstron, 2000). However, Becker (1989) found a more positive effect for happiness with business students who valued power, a value acceptable in business programs, but perhaps not as acceptable in psychology which encourages an environment of universalism, thus supporting the environment-match hypothesis to some extent. It should be noted that different researchers used different value measures such as the Schwartz Value Inventory (Schwartz, 1992) or the Aspiration Index (Kasser & Ryan, 1993) which may partially account for variation in the results.

The evidence that well-being is negatively affected by a strong extrinsic material orientation is consistent with self-determination theory (Deci & Ryan, 1987). This viewpoint postulates that the attention placed on extrinsic values lessens one's ability to make decisions based upon innate preferences. For example, the need to make large sums of money, an extrinsic reward, becomes a controlling experience caused by an external motivator that weakens one's ability to self-determine or make autonomous decisions which frequently leads to anxiety and frustration. In contrast, those who are oriented towards fulfilling innate self-determination needs report greater well-being and less psychological disorder (Srivastava et al., 2001).

## MATERIALISM AND ACQUISITION

Acquisition behavior is seldom the principal materialist goal, but rather a means to satisfy a range of deeper intangible needs such as recognition, image, ego reinforcement, identity, popularity, psychological security, status, and dominion. As efforts to meet these extrinsic ambitions are reinforced and become habitual the acts of unrestrained consumption and overindulgence may be further cultivated and often manifest in activities detrimental to the individual as well as the natural environment. It is concerning that that the number of college freshmen indicating as very important "being very well off financially" has risen from 44 percent in 1966 to 82 percent in 2013 (Eagan, Lozano, Hurtado & Case, 2013). This raises questions regarding whether college students across majors are more worried about their long-term prospects of living well, or if material interests have superseded higher order needs. Three themes have consistently emerged in theorists' descriptions of materialism: acquisition centrality, acquisition as the pursuit of happiness and possession-defined success (Promislo, Giacalone & Deckop, 2017.; Richins & Dawson, 1992). The themes are consistent across cultures (Eastman, Fredenberger, Campbell & Calvert, 1997; Karabati & Cemalcilar, 2010; Kilbourne, Grünhagen, & Foley, 2005) and they manifest themselves in childhood (Richins & Chaplin, 2015).

### Acquisition as the pursuit of happiness

Acquisition as the pursuit of happiness refers to the belief that the accumulation of possessions will lead to happiness. Although most individuals pursue happiness in some way,

this form of materialism occurs when the accumulation of possessions is the means by which a person tries to achieve happiness (Richins & Dawson, 1992).

***Hypothesis 1a**: Business students will value acquisition as the pursuit of happiness more than non-business students*

### Acquisition centrality

Acquisition centrality refers to a lifestyle where material consumption is a primary goal. Individuals high in acquisition centrality materialism find meaning through acquisition and consumption. They use this to make plans and guide their actions (Richins & Dawson, 1992).

***Hypothesis 1b**: Business students will value acquisition centrality more than non-business students*

### Possession-defined success

Possession-defined success is when materialists judge their own and others success by the quantity and quality of their possessions. They are more interested in the cost of the possessions that the utility that they provide or how well they serve their purpose (Richins & Dawson, 1992).

***Hypothesis 1c**: Business students will value possession-defined success more than non-business students*

## POSITIVE AND NEGATIVE AFFECTIVITY

The psycho-physiological construct of affect was proposed to have two components, namely positive affect (PA) and negative affect (NA) (Watson & Tellegen, 1988). This proposition was confirmed empirically, where PA and NA were the two dominant dimensions that emerged as the first two components in a factor analysis (Watson, Clark & Tellegen, 1988). Later studies confirmed the support of a two-factor structure (Leue & Beauducel, 2011; Wedderhoff, Gnambs, Wedderhoff, Burgard & Bosnjak, 2021). In brief, these traits account for the emotional interaction with stimuli that is realized uniquely by individuals to various situations. PA reflects the extent to which a person feels enthusiastic, cheerful, energetic, pleasantly involved and alert. In contrast, a person low in PA can be characterized by sadness, lethargy, and distress. Low PA, however, does not constitute NA as these two traits, PA and NA are independent of each other (Watson et al., 1988). Further research has established that PA has 3 facets - joy, interest and activation (Egloff, Schmukle, Burns, Kohlmann & Hocket, 2003).

NA is characterized by negative emotions that subsumes a variety of adverse mood states including anger, disgust, fear, guilt, and nervousness. Low NA scores indicate a mood state of calmness, tranquility, and peace. Individuals may score high or low in both PA and NA, or high in one and low in the other, and scores remain stable over time (Watson et al., 1988).

### Implications of positive affectivity

Positive affectivity enables individuals to process emotional information with accuracy and efficiency in efforts to formulate plans, resolve problems and accomplish goals. It may broaden the capacity to expand thought-action processes assuming an elevated level of emotional intensity does not interfere with cognitive scope. More commonly, high-PA individuals demonstrate energy, optimism, engagement, and social interest, and are more likely to report life satisfaction and subjective well-being. These characteristics roughly correspond to personality factors associated with extraversion, social interest, optimism, and confidence. This may be manifested in positive or constructive controversy with supervisors where high PA individuals are more likely to broaden their cognitive repertoire, heighten attentional focus, and increase their level of engagement.

***Hypothesis 2a****: Positive affectivity is negatively related to acquisition as the pursuit of happiness*
***Hypothesis 2b****: Positive affectivity is negatively related to acquisition centrality*
***Hypothesis 2c****: Positive affectivity is negatively related to possession-defined success*

### Implications of negative affectivity

Individuals with high negative affectivity view the world, relationships, and the future in generally negative terms. Emotions may include anger, contempt, distrust, guilt, fear and nervousness in a general orientation of dissatisfaction with both them and the world. These findings, however, compliment evolutionary psychology as adaptive functions in the development of cognitive strategies to deal with challenges. Thus, negative affect (NA) individuals appear to rely more upon controlled analytic approaches drawn from life circumstances than do those high in positive affect (PA). This cautious processing of new or complex information as opposed to leveraging pre-existing knowledge is advantageous in dealing with deception, misinformation, or manipulation of received information and the accuracy of details. In either case, however, both PA and NA scores are indicators of life satisfaction and well-being (Mehmood, Hanif & Noureen, 2020; Pacheco & Kamble, 2016).

***Hypothesis 3a****: Negative affectivity is positively related to acquisition as the pursuit of happiness*
***Hypothesis 3b****: Negative affectivity is positively related to acquisition centrality*
***Hypothesis 3c****: Negative affectivity is positively related to possession-defined success*

## AFFECTIVITY AND ACADEMIC MAJOR

We have argued that business students would be more materialistic than non-business students. We have also argued that positive and negative affectivity are (respectively) negatively and positively related to materialism. Combining these arguments give us:

***Hypothesis 4a****: Business students will have lower positive affect than non-business students*
***Hypothesis 4b****: Business students will have higher negative affect than non-business students*

## METHODOLOGY

Participants: Business and liberal arts students were selected from a midsize public university in northern New Jersey, U.S.A. Participation was voluntary and consisted of 131 subjects of which 68 (51.9%) were from the university's College of Business accredited by the Association to Advance Collegiate Schools of Business (AACSB). The business students' concentrations included management, marketing, finance, accounting, sales, sports management, entrepreneurship, and music management. The remaining 60 (45.8%) students were from liberal arts and included majors in education, humanities, and social sciences, and 3 (2.3%) did not give a major. Demographic information included age, gender, and any work experience. The mean age of the subjects was 24.38 years with a range from 18 to 64 with nine participants who did not indicate age. Gender: 67 were males (51.2%) and 64 were females (48.8%).

## MEASURES

### Materialism

This study utilized the Richins and Dawson (1992) instrument. It captures three themes that have been consistent in previous research: material acquisition centrality, material success, and material happiness.

The instrument contains 18 questions which make up the above subscales and overall total, and is scored on a 5-point scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Reliability coefficients in our sample were Materialism (18 items) alpha = .87, Happiness (5 items) alpha = .73, Acquisition Centrality (7 items) alpha = .731 and Success (6 items) alpha = .72 (Chronbach, 1951).

### Positive and negative affect schedule (PANAS-SF)

This is a 20-item questionnaire that has been developed and extensively validated to measure two subscales: positive affect (PA) and negative affect (NA) as measured by the subject on a five-point scale (Watson et al., 1988). This is the most commonly used measure in scholarly research for affect with 10 PA single word items and 10 NA single word items to be rated. The scale ranges from: Very slightly or not at all, A little, Moderately, Quite a bit, and Extremely. Reliability coefficients in our sample were positive affectivity (10 items) .90 and negative affectivity (08 items) alpha = .85 (Chronbach, 1951).

## RESULTS

Table 1 shows the descriptive statistics and correlations for the materialism scales, PANAS scales, age and years of full-time work experience.

**Table 1**
**CORRELATION TABLE**

| # | Variable | Mean | S.D. | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Happiness | 3.07 | 0.79 | (.726) | | | | | |
| 2 | Centrality | 2.81 | 0.64 | .522** | (.731) | | | | |
| 3 | Success | 2.66 | 0.67 | .470** | .687** | (.723) | | | |
| 4 | PANASP | 3.62 | 0.73 | -.304** | -.092 | -.088 | (.902) | | |
| 5 | PANASN | 2.28 | 0.73 | .358** | .182* | .149 | -.300** | (.848) | |
| 6 | Age | 24.99 | 7.91 | -.358** | -.395** | -.356** | .158 | -.105 | |
| 7 | Years FT Work | 3.78 | 6.60 | -.393** | -.336** | -.386** | .080 | -.101 | .760** |

** p < .01, *, p< .05, Cronbach's alpha reliabilities are in parentheses on the diagonal

Table 2 shows the results of empirical testing of hypotheses 1a,1b,1c. The results were mixed. Business students showed no difference from non-business students in their perception that possessions are needed for happiness than non-business students (H1a) but did value acquisition centrality (H1b) and success (H1c) more.

**Table 2**
**INDEPENDENT SAMPLES t-TEST FOR EQUALITY OF MEANS**

| | Major | N | Mean | Mean Difference | T | One-Sided p |
|---|---|---|---|---|---|---|
| Happiness | Business | 63 | 3.054 | -0.031 | -0.215 | 0.415 |
| | Non-Business | 56 | 3.085 | | | |
| Centrality | Business | 63 | 2.936 | 0.251 | 2.178 | 0.016 |
| | Non-Business | 56 | 2.685 | | | |
| Success | Business | 63 | 2.766 | 0.201 | 1.659 | 0.050 |
| | Non-Business | 56 | 2.565 | | | |

Hypotheses 2a,2b,2c,3a,3b,3c were tested with correlation analyses (Table 1). Positive affectivity was negatively related to happiness (H2a), but not to acquisition centrality (H2b) or success (H2c). Negative affectivity was positively related to happiness (H3a) and acquisition centrality (H3b), but not to success (H3c). Table 3 shows the testing of hypotheses 4a,4b. There was no significant difference in the positive (H4a) and negative (H4b) affectivity scores of business and non-business students.

| Table 3<br>INDEPENDENT SAMPLES t-TEST FOR EQUALITY OF MEANS | | | | | | |
|---|---|---|---|---|---|---|
| | Major | N | Mean | Mean Difference | t | One-Sided p |
| PANASP | Business | 63 | 3.641 | 0.030 | 0.224 | 0.412 |
| | Non-Business | 55 | 3.611 | | | |
| PANASN | Business | 63 | 2.215 | -0.156 | -1.138 | 0.129 |
| | Non-Business | 55 | 2.371 | | | |

Table 4 shows the results of all of the hypothesis testing.

| Table 4<br>SUMMARY OF HYPOTHESES TEST RESULTS | |
|---|---|
| Hypotheses | Significance |
| H1a: Business students will value Happiness more than non-business students | p = .415 not supported |
| H1b: Business students will value Centrality more than non-business students | p = .016 supported |
| H1c: Business students will value Success more than non-business students | p = .050 supported |
| H2a: Positive Affectivity is negatively related to Happiness | p <.01 supported |
| H2b: Positive Affectivity is negatively related to Acquisition Centrality | p = .320 not supported |
| H2c: Positive Affectivity is negatively related to Success | p = .341 not supported |
| H3a: Negative Affectivity is positively related to Happiness | p <.01 supported |
| H3b: Negative Affectivity is positively related to Acquisition Centrality | p =.031 supported |
| H3c: Negative Affectivity is positively related to Success | p = .105 not supported |
| H4a: Business students will have higher Positive Affect than non-business students | p = .412 not supported |
| H4b: Business students will have lower Negative Affect than non-business students | p = .126 not supported |

Age, years of full-time work and gender were not addressed in the theory development or presented as hypotheses, however both age and years of full-time work experience were negatively related to all three subscales of materialism (Table 5). No differences in any of the materialism subscales were found between men and women.

| Table 5<br>ADDITIONAL FINDINGS | |
|---|---|
| Finding | Significance |
| Age is negatively related to Happiness | p <.01 |
| Age is negatively related to Acquisition Centrality | p <.01 |
| Age is negatively related to Success | p <.01 |
| Years of full-time work is negatively related to Happiness | p <.01 |
| Years of full-time work is negatively related to Acquisition Centrality | p <.01 |
| Years of full-time work is negatively related to Success | p <.01 |

## DISCUSSION

The results of the first set of hypotheses showed no difference in the perception that possessions are needed for happiness value of happiness between business students and non-business students. This is contrary to past studies (Kasser & Ahuvia, 2002; Yu & Levesque-Bristol, 2018) and exposes the current pervasiveness of materialistic values. It is clear that materialism is not limited to the business school. However, consistent with previous research (Nagpaul & Pang, 2017; Robak et al., 2007; Robak, Chiffriller & Zappone, 2007) the business students did value acquisition centrality and success higher than non- business students. This can be due to a number of causes, including a greater familiarity with and exposure to the material possessions that are indicators of wealth and power.

The tests of the relationship between the facets of materialism and positive and negative affect gave mixed results. Acquisition as the pursuit of happiness was found to be related to both positive and negative affect as expected. Acquisition centrality was found to be related to negative affect but not positive affect, and possession-defined success was not related to either. However, it is important to remember that prior research has found that materialism is negatively related to well-being (Dittmar, Bond & Hurst, 2014). Our findings combined with prior research indicates a direct relationship between well-being and materialism exists without affect as a mediator for these two facets of materialism. The prescription for universities is to de-emphasize materialism in general and to teach that the accumulation of possessions is not an effective way to achieve happiness. One way to decrease materialism is to encourage critical thinking, because complex and elaborate thinking is negatively related to materialism (Elphinstone & Critchley, 2016).

We argued that business students would have lower positive affect and higher negative affect than non-business students be more materialistic than non-business students. Our rationale for the hypotheses was based on the arguments that positive and negative affectivity are (respectively) negatively and positively related to materialism, and that materialism is higher in business than non-business students. Contrary to prior studies (Robak et al., 2007; Bergman et

al., 2014) the results did not support any difference in positive or negative affect between business and non-business students. These negative results are consistent with the finding that there is no difference in the perception that possessions are needed for happiness value of happiness between business students and non-business students. They are not consistent with the finding that business students did value acquisition centrality and success higher than non-business students. However, as mentioned above, the differences can be explained by other causes that would not necessarily change affect.

The general support for positive affectivity being negatively related to materialism, and negative affectivity being positively related to materialism is consistent with the conceptual bases of the constructs and past empirical tests. The causal link is unclear; however, it is likely to be a reinforcing loop. As such, it is possible to volitionally change your behavior and sense making towards positive affectivity and away from materialism. As business professors we should not overly emphasize material gain and profit maximization. Other conceptualizations such as the triple bottom line of people, profits and planet (Elkington, 1997) allow for students to use the tools that are taught for running business while valuing things beyond their own material gain.

We found that age and number of years of full-time employment were negatively related to all three facets of materialism. This is consistent with prior research that showed that levels of materialism are related to self-uncertainty and go down as one gets older (Martin, Czellar & Pandelaere, 2019). Other research found that materialism decreases until middle age and then goes up (Jaspers & Pieters, 2016). Perhaps life and work experience erode materialistic attitudes because emerging life and career concerns become more important. This preliminary finding warrants further investigation.

An overly inflated view of self often exposes an underlying frailty associated with self-doubt and inadequacy. This, in turn, appears to be linked to a disproportionate focus on power and accumulation of wealth, or other status items. These individuals are hypervigilant for any suggestion of ego threat and may use materialism as protection mechanism against implicit feelings of worthlessness. Thus, their search for well-being appears elusive while concepts of empathy and altruism may barely surface. Research has also shown that as one places their own interests above others, they are also likely to exploit available resources for their own benefit if even only in the short run (Campbell, Goodie & Foster, 2004). This lack of desire to help others is also displayed as a lack of environmental concern in those that score high in materialism (Bergman et al., 2014).

Materialism is related to narcissism and is consistent with the narcissists' drive to gain and then extend external acceptance and admiration (Bergman et al., 2014). At the same time, strong narcissistic individuals usually display inflated egos along with fragile self-esteem issues that may approach a sense of worthlessness and require further external affirmation to quell feelings of discomfort (Horvath & Morph, 2009). This is largely consistent with business students' extrinsic values (Bergman et al., 2014). Unfortunately, narcissism is also a stable trait usually requiring lengthy and specialized programs for attitudinal modification.

From a social constructionist perspective there may still be other factors such as poverty, instability or relationship issues encountered in youth that drive materialism and impact value

formation during key development stages. Consumer researchers often focus on product positioning to meet the demands of people's materialistic drives while social critics may have more interest in how to reduce consumption while improving well-being and preserving natural resources.

## CONCLUSIONS

As much of society is recognizing the powerful impact of industrialization on nature and human well- being, management education must foster a broader and deeper role in developing leaders who are both capable and caring role models of behavior. However, studies have shown that business students have been taught to make analytical decisions based upon hard data with empathy taking a back seat. Self- interests are also higher among business students which may lead to an exploitation of common resources (Campbell et al., 2004).

Some ideas for further research:

- Does materialism influence how engaged business students are, as potential leaders, in their personal appreciation of the environment and ethical issues? How can educators support the development of these values?
- What means (programs, interventions, pedagogy) are there for business schools or other disciplines to help students understand materialism and their personal well-being?
- Although the issue of self-selection into business schools requires further investigation, it would follow that there may be opportunity for business education to contribute to a healthier modification of student values.
- How should we define affect and well-being as part of the "New" American Dream?

Adams addressed education in writing about the American Dream. He said "There are obviously two educations. One should teach us how to make a living and the other how to live. Surely these should never be confused in the mind of any man who has the slightest inkling of what culture is." (Adams, 1931). We should heed these words and ask, "Do we want the new 'American Dream' to be increasingly materialistic?" If not, higher education will need to play a role in changing the trend.

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# LEGITIMIZING AND DELEGITIMIZING STRATEGIES OF PLANNED PARENTHOOD, CARE NET AND THEIR SUPPORTERS

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## ABSTRACT

*Organizations establish legitimacy by adhering to socially-constructed norms (Pfeffer, 1981; Suchman, 1995). Most of the organizational legitimacy literature focuses on the organization's strategies to establish legitimacy rather than delegitimatizing strategies by competitors or competitors' supporters (Dowling & Pfeffer, 1975; Du & Vieira, 2012; Long & Driscoll, 2008; Suchman, 1995). Delegitimizing strategies have become pronounced in the internet age, particularly in visible and controversial industries that need external social and political support. We have examined strategies that United States-based abortion provider Planned Parenthood and the Care Net pregnancy resource centers (PRCs) have used to maintain legitimacy and positive reputations. We have selected these two organizations due to significant attention that both have received in the wake of the 2022 Supreme Court decision to overturn Roe v. Wade in the United States. We find evidence of attempts by both organizations to delegitimize their competitors through marketing and communications strategies that undermine public perceptions of the moral standing of the opposing position. We further find that while both appeal to prevalent norms and values, PRC appeals are grounded in static Biblical authority. At the same time, abortion providers are based on more dynamic societal norms and values. We next examine their rankings as charities from a third-party perspective, finding that both organizations have achieved relatively high rankings. These findings suggest organizational legitimacy in the eyes of some external stakeholders. Theoretical and practical implications are offered.*

## INTRODUCTION

Given the easy access to information in this internet age, organizations must be timely and diligent in establishing and maintaining stakeholder perceptions of legitimacy, especially when the public is paying close attention to the industry. One highly visible industry under consistent public scrutiny is the ecosystem of firms that provide resources and services for pregnant women. This scrutiny was heightened in the United States when Supreme Court justices overturned Roe v. Wade in June of 2022.

Two players in this industry are Planned Parenthood and Care Net. Planned Parenthood provides a variety of services for pregnant women, including abortion. Care Net provides

counseling and other resources for pregnant women, but does not provide abortion services and actively discourages women from seeking abortion. Their competing interests in a climate of political hostility have led to various self-legitimizing strategies and others-delegitimizing strategies, which come from the organizations themselves and those who either support or reject their causes. Given the importance of legitimacy to the very survival of these organizations (Dowling & Pfeffer, 1975), strategies they employ to establish and maintain legitimacy are paramount.

The battles between pregnancy resource centers (PRCs), abortion providers, and opponents on both sides have been highly visible, ethically questionable, and strategically hostile. Since the 1960s, thousands of pregnancy resource centers (known initially as crisis pregnancy centers) have emerged throughout the United States (Gaul, 2021). PRC opponents have referred to these centers as "pseudo-clinics" that attempt to convince pregnant women not to choose abortions (Gilbert, 2013) and have argued that PRCs provide false or misleading information about abortions to women (Bryant et al., 2014). On the other hand, Planned Parenthood opponents have released undercover videos that have detailed its process of extracting fetal organs for donation (Woodruff, 2015) and have claimed Planned Parenthood has been facilitating sex trafficking of minors (Dwyer, 2011). Such actions likely impact public perceptions of the organizational legitimacy of PRCs such as Care Net and abortion providers such as Planned Parenthood. The present study examines ways these organizations have used to establish and maintain their moral legitimacy. We also examine external perceptions of these organizations through a third party: Charity Navigator. Given the political tensions towards both sides following the Roe v. Wade decision, we believe our study can add a relevant and rational perspective on how both sides have navigated raging seas to maintain their presence. We have not found other studies that have examined these highly visible and controversial organizations in these ways, so we believe our contribution is helpful to business strategists, practitioners, and academics.

## LEGITIMIZING AND DELEGITIMIZING STRATEGIES

Organizations use various legitimizing approaches to build their reputations as ethical firms with the moral high ground (cf. Long & Driscoll, 2008). Pfeffer (1981, p. 4) defined organizations as "systems of patterned or structured activity in which the participants attempt to develop causal explanations and rationalizations for these patterns of activity, with the explanations being constrained to be legitimate and acceptable in the social context and with the further preference for explanations that provide a feeling of control over events." Legitimacy is further defined by Suchman (1995, p. 574) as "a generalized perception that the actions of an entity are desirable, proper or appropriate within some constructed system of norms, values, beliefs, and definitions." Legitimization comes when an organization's value system aligns with the normative values of the superordinate system in which it operates (Parsons, 1956). This system includes consistency with norms, social rules, and laws (Tang, 2017). "Legitimacy is a constraint, therefore, on organizational behavior, but it is a dynamic constraint which changes as

organizations adapt, and as the social values which define legitimacy change and are changed" (Dowling & Pfeffer, 1975, p. 126).

Prior research in organizational legitimacy has focused on strategies that organizations have used to gain or maintain legitimacy, which is necessary for the firm survival (e.g., Dowling & Pfeffer, 1975). The present research focuses not only on the legitimization strategies employed by Planned Parenthood and Care Net but also on the delegitimization strategies employed by their competitors and the supporters of those competitors. In industries in which strong political views fuel opposing players, these attempts have the potential to wreak havoc on the long-term sustainability of the organizations involved. As proffered decades ago by Dowling and Pfeffer (1975), organizations that are more visible and those that need social and political support have a much greater need for legitimacy than others with opposing characteristics. Achieving the moral high ground by establishing and maintaining legitimacy may be particularly important in such industries to survive.

Moral legitimacy refers to conformance with social values and obligations (Long & Driscoll, 2008). Moral legitimacy may be achieved by examining the consequences of actions to maximize the greatest good for the greatest number of people (utilitarianism) or by determining whether acts are in conformance with our moral obligations to do what is right (deontology) (Suchman, 1995).

Planned Parenthood is in a controversial (but legal) industry sector. Research into legitimacy-seeking strategies of organizations in controversial industries is relatively rare (Reast et al., 2013). To establish legitimacy in such a sector, the organization may apply utilitarian justifications by proposing that ethically correct actions minimize harm and maximize good (Lindorff et al., 2012). "Therefore, any action that creates social good by a legally operating firm, whether in a controversial or noncontroversial sector, should be seen as preferable to the absence of any such actions by that firm" (Lindorff et al., 2012, p. 464). This framework also corresponds to "the ends justify the means." Utilitarian ethical frameworks *minimize* harm rather than *do no harm*. Doing no harm falls under the deontological ethical framework in which people have a moral duty to do what is right. Since some consider induced abortions morally wrong in all situations, utilitarian ethical frameworks may be more appropriate for Planned Parenthood's organizational legitimacy strategies than deontological ethical applications. PRCs do not provide abortions, which may make them seem less controversial to some people. PRCs may apply a deontological framework in establishing organizational legitimacy so long as they tell the truth in their messaging, as truth is a moral obligation under the deontological framework. Given these moral constraints, the question of whether abortion providers and PRCs use either approach is valid.

To flesh out these issues, we have organized our analysis as follows: we begin with a discussion of the current political climate in the U.S. concerning abortions. We next discuss two organizations with a vested interest in pregnant women: Care Net and Planned Parenthood. We present some of the criticisms of both organizations, along with the organizations' responses. We examine the ethical frameworks used and whether their strategies have been effective through the evaluations of a nonpartisan third party. We then offer theoretical and practical implications.

## ABORTIONS IN THE UNITED STATES

In the wake of the 2022 U.S. Supreme Court (SCOTUS) decision to overturn the landmark abortion rulings in *Roe v. Wade* and *Planned Parenthood v. Casey* and return decisions about abortions to the states, pro-choice and pro-life activists have renewed interests in this half-century-long battle. The right to abortion now varies by the laws within state governments. Following this decision, "trigger" laws in some states led to an immediate ban of abortions in Alabama, Arkansas, Kentucky, Louisiana, Missouri, Oklahoma, South Dakota, and Utah (Kimball, 2022). Abortions can still be obtained in states such as Alaska, California, Illinois, Maine, New Jersey, New York, Oregon, and Washington (Ewall-Wice & Quinn, 2022).

Since *Roe v. Wade* passed in 1973, advocates for "pro-choice" and "pro-life" positions have grown. Those who advocate the pro-choice position believe abortions are among women's reproductive rights and should be private decisions between them and their doctors. They believe they have a constitutional right to privacy. They further side with the Roe v. Wade decision by Justice Harry Blackmun that the unborn are not persons. If they are persons, they would be entitled to a right to life via the 14th Amendment of the Constitution. The 14th Amendment says that "no State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws." Those on this side further embrace the ideas of choice and female empowerment. Those who advocate the pro-life position consider the unborn to be persons within the meaning and language of the 5th and 14th Amendments with unalienable rights that should be protected through the jurisdiction of the states (Roden, 2010). A person can be defined as "a human being who has rights that are enforceable in a court of law" (Roden, 2010, p. 188). This definition of a person differs from another definition of personhood, which is a standing or status bestowed upon someone based on the others' perceptions (Hunter et al., 2013; Kitwood, 1997; Newton et al., 2021). These types of varying views on abortion occur between generations. In a study of 2,596 United States (U.S.) respondents to the World Values Surveys, Thomason, Weeks, and Galperin (2022) found that younger generations Y and Z (born after 1981) are significantly more likely than their older counterparts to consider abortions justifiable.

Abortions are moral issues that require moral judgments. "And the person who says that abortion is always wrong is saying something about abortion that contradicts what is said by someone who says that abortion is sometimes morally permissible. As such, and unlike the situation in which different people simply and solely express their feelings or preferences, moral judgments do need to be defended, do need to be justified, do need to be validated" (Regan, 1997, p. 104).

Women with unwanted pregnancies face the difficult choices of inducing abortions or carrying their babies to term. Their families are often involved in helping them make their decisions. They need wisdom in deciding between sometimes winless situations with either better or worse wrongs (Nayak, 2016). To make these ethical decisions, they may use a deontological approach by focusing on their moral duties to do what is right. They may also

consider a consequential framework by maximizing good and minimizing harm. They may glean some wisdom from the healthcare centers that attend to pregnant women.

## PREGNANCY RESOURCE CENTERS AND PLANNED PARENTHOOD

The Planned Parenthood Federation of America (or Planned Parenthood) is one of the largest nonprofit healthcare and sex education providers in the United States. Pregnancy resource centers (PRCs) are faith-based and/or community-based nonprofit pregnancy services providers. Both are funded by government and private donations. PRCs often serve minority populations of lower socioeconomic status (Rice et al., 2021) by providing free or low-cost confidential counseling, food, housing, maternity supplies, and other pregnancy-related information (Tushnet, 2003). They provide products and services such as ultrasounds, pregnancy testing, sexually transmitted disease testing, counseling, abortion pill reversal, education, cribs, diapers, baby car seats, baby clothing, and other maternity products (Gaul, 2021). In 2019, they served nearly 2 million people with assistance valued over $266 million (Gaul, 2021). PRCs may or may not be licensed and may or may not include professional medical doctors, nurses, or nurse practitioners. Twenty-five percent of PRCs' 14,977 staff members in 2019 were licensed medical professionals (Gaul, 2021). Client satisfaction exit surveys from Care Net and Heartbeat International (around 2,100 centers) have indicated that over 99 percent of women have positive experiences in PRCs (Gaul, 2021). Unlike Planned Parenthood, PRCs do not provide abortions, though some women may not realize that when they enter the PRCs, which often include words such as "choice" in their names. Instead, they attempt to dissuade women from having abortions (Bryant et al., 2014; Campbell, 2017). Currently, there are over 3,000 PRCs in the United States (Gaul, 2021) and over 600 Planned Parenthood facilities (Anonymous, 2022d). Planned Parenthood conducts pregnancy testing, sexually transmitted disease testing, HIV testing, cancer breast exams, pap smears, abortions, contraception, sex education, and hormones for transgender patients (Anonymous, 2022d). In 2019, Planned Parenthood performed 354,871 abortions (Anonymous, 2020). Over the long term, Planned Parenthood has had an inflationary impact on the number of abortions in the U.S. (Studnicki & Fisher, 2018).

## CRITICISMS OF PRCS AND PRC RESPONSES

Criticisms of PRCs have labeled them "pseudo-clinics" (Gilbert, 2013), fake clinics (Thomsen & Morrison, 2020), unethical (Bryant & Swartz, 2018), and providers of misleading or false information (Bryant et al., 2014). Because PRCs do not charge for their services and are not medical practices, they are exempt from the regulatory laws and statutes that apply to medical providers (Bryant & Swartz, 2018). At a Planned Parenthood website, bold pink and blue messaging states, "pregnancy resource centers are anti-choice, anti-abortion, faith-based, fake clinics with no oversight…no honesty…no choices…no privacy… and no separation…of church and state" (Anonymous, 2022c, p. 1). "Their goal is not to educate and inform, but to stall, deceive, evade, lecture, and manipulate -- everything but share honest information and

care" (Anonymous, 2022c, p. 2). At the University of California in Santa Barbara, a queer reproductive justice student club called "End Fake Clinics" paired with their student government to ban PRCs from falsely advertising on their campus (Thomsen & Morrison, 2020). Opposition against them has spiked following the overturn of *Roe v. Wade,* which has fueled some activists to set fires at numerous PRCs across the United States. For example, on June 7th, 2022, CompassCare in Buffalo, New York was "fire-bombed" (Anonymous, 2022b). In Longmont, Colorado, arsonists set fire to a Christian-based PRC and spray-painted the message, "if abortions aren't safe, neither are you" (O'Neill, 2022). This message has appeared at dozens of PRCs since the SCOTUS opinion on *Roe v. Wade* was leaked in May 2022 (O'Neill, 2022).

Some have called for additional regulations on PRCs. For example, the California Reproductive Freedom and Transparency Act (FACT Act) required licensed PRCs to notify women that California provides free or low-cost services such as abortions and provides women with the phone numbers of such providers. Unlicensed clinics were told to notify women that they had yet to be licensed in California. In 2018, the U.S. Supreme Court adjudicated a case between the National Institute of Family and Life Advocates, DBA NIFLA et al., v. Becerra, Attorney General of California, et al. The Court determined these requirements were "wildly underinclusive" in that California singled out the PRCs for the messaging and ignored numerous other community clinics and health centers. The Court determined these requirements violated the free speech clause of the 1st Amendment ("National Institute of Family and Life Advocates, DBA NIFLA, et al., Petitioners v. Xavier Becera, Attorney General of California, et al. ," 2018).

Other PRC practices have been called into question, which may impact public perceptions of their legitimacy. For example, Bryant and colleagues (2014) analyzed 254 websites of 348 PRCs, determining that 80 percent provided at least one false or misleading statement about abortions. The most common of these statements were related to links between abortion and preterm birth, breast cancer, infertility, post-abortion stress, and mental health risks. Bryant and colleagues (2014) suggested these PRCs should not be included in state directories as resources for pregnant women. They state that "scientific evidence does not support the notion that abortion is harmful to women or has multiple long-term health consequences," so "states should not include agencies that provide inaccurate information on abortion in their resource directories for pregnant women" (p. 604). Organizations such as Care Net have countered the above claims by providing links to academic medical studies on their website, suggesting links between various adverse health outcomes and induced abortions (Anonymous, 2022a). The Care Net president has also spoken out against similar adverse PRC claims by television personalities such as John Oliver (Warren, 2018). To counter John Oliver's calling "BS" on PRCs who state that induced abortions relate to breast cancer, Warren cited 108 global studies on induced abortions and breast cancer. He stated that 79 found an increased risk between induced abortions and the later development of breast cancer. He further included a meta-analysis of 36 studies by Huang, Zhang, Li, and colleagues (2014), which found that induced abortions were significantly associated with breast cancer and the chances of breast cancer increased with the number of abortions. His video also included a link to a web page that cited those studies.

One freelance reporter, Eve Tushnet (2003), described her experience working in a PRC in North Carolina, where she worked directly with many women: "What would have to change in

your life to make you feel good about this baby? Public officials' tweaking a regulation here or funding an initiative there will not untangle the emotional roots of out-of-wedlock pregnancy. What is needed more than anything is a realistic hope. Men and women need models of chastity, marriage, and fatherhood. They need to be able to imagine themselves as abstinent singles or married parents and know how to make realistic plans toward those goals" (Tushnet, 2003, p. 111). PRCs provide women with this type of confidential counseling, which may be beneficial in light of recent spikes in mental health issues. The percentage of women reporting serious mental health issues in the United States has skyrocketed between 2008 and 2019. In 2019, the percentages were as follows by ages: 18-25: 11.4 percent; 26-49: 8.6 percent; and 50+: 3.5 percent (MCCance-Katz, 2019).

## CRITICS OF PLANNED PARENTHOOD AND PLANNED PARENTHOOD RESPONSES

Due to the ethically questionable aspects of their abortion services, Planned Parenthood is not without its vocal critics. Anti-abortion protesters often march outside Planned Parenthood facilities, trying to stop pregnant women from seeking abortions (Skinner, 2022). Numerous protesters have bombed abortion clinics (Anonymous, 2022e). Organizations led by pro-life activists, such as Lila Rose's Live Action have gone undercover into numerous Planned Parenthood clinics with hidden video cameras to expose their facilitation of the sex trafficking of minors (Dwyer, 2011). Planned Parenthood condemned the video as a "dirty tricks campaign" and stated that the video "may be a hoax" (Dwyer, 2011). Planned Parenthood also fired the worker and claimed to have notified law enforcement of an alleged sex trafficking ring weeks earlier (Dwyer, 2011). Anti-abortion activists released another video in which two persons posed as medical researchers to purchase fetal tissue with Dr. Deborah Nucatola, the national medical director for Planned Parenthood (Woodruff, 2015). When asked about specific body parts, Nucatola responded, "It makes a huge difference. I'd say a lot of people want liver. Exactly. So then you're just kind of cognizant of where you put your graspers, you try to intentionally go above and below the thorax, so that, you know, we've been very good at getting heart, lung, liver, because we know that, so I'm not going to crush that part, I'm going to basically crush below, I'm going to crush above, and I'm going to see if I can get it all intact" (Woodruff, 2015). Selling fetal tissue is illegal, but recovering costs from donating fetal tissue for research and charging administrative fees for storage or shipping is legal (Watts, 2015; Woodruff, 2015). Planned Parenthood has denied making any profits from the donated tissue (Woodruff, 2015). Former Planned Parenthood president Cecile Richards also released a video denying the allegation that Planned Parenthood makes any profit from donated fetal tissue (Richards, 2015). She stated that Planned Parenthood's donation programs follow all legal and ethical guidelines, and she apologized for the staff member's tone and statements. Furthermore, she said the donated fetal tissue was used with the family's permission and can help study diseases such as Parkinson's and Alzheimer's.

## STRATEGIES FOR THE LEGITIMACY OF PRCS AND PLANNED PARENTHOOD

As noted at the outset, Planned Parenthood and PRCs have a vested interest in achieving moral legitimacy among the public. Planned Parenthood tends to minimize or discount the risks, while PRCs may focus too much on them. In addition to citing risks, Planned Parenthood and PRCs use a variety of other approaches to establish legitimacy. Integrating the framework established in the legitimacy strategies to boost perceptions of corporate social responsibility (CSR) of firms in another controversial industry (Du & Vieira, 2012), we next present a content analysis of themes from the websites of Planned Parenthood (https://plannedparenthood.org) and Care Net (http://care-net.org).

**Table 1: Care Net's and Planned Parenthood's CSR Legitimacy-Seeking Strategies**

| Approach | Illustrative Examples |
|---|---|
| CSR in mission | Care Net: "Acknowledging that every human life begins at conception and is worthy of protection, Care Net offers compassion, hope, and help to anyone considering abortion by presenting them with realistic alternatives and Christ-centered support through our life-affirming network of pregnancy centers, churches, organizations, and individuals."<br>Planned Parenthood: "Advocate for public policies that protect and expand reproductive rights and access to a full range of sexual and reproductive health care services, including abortion; Provide medically accurate education that advances the understanding of human sexuality, healthy relationships, and body autonomy;<br>Promote research and technology that enhances reproductive health care and access. |
| Education | Care Net: "Pro-life 101" free online course<br>Planned Parenthood: "Ask the experts" frequently asked questions. |
| Positive and negative information | Care Net: "There is a father absence crisis in America. According to the U.S. Census Bureau, 19.7 million children, more than 1 in 4, live without a father in the home. Consequently, there is a father factor in nearly all social ills facing America today." "Positive interaction with either parent contributes to a child's well-being. Yet research consistently shows that children who have positive experiences with only their mothers lack the nurturing and life skills that come when both parents are involved in their lives."<br>Planned Parenthood: "The emotional effects of induced abortion." "Any association between multiple abortion and mental health problems may be due to cooccurring |

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| | factors — circumstances, conditions, and behaviors — that may predispose a woman to both multiple unwanted pregnancies and mental health problems (TFMHA)." |
| Industry-wide association membership | Care Net: "a member of the Evangelical Council for Financial Accountability; a Charity Navigator Four Star Charity: a Guide Star Silver Participant; an Accredited Member of Christian Services Charities; an Accredited Charity with the BBB Wise Giving Alliance; a member of National Religious Broadcasters; and has been on the Best Christian Workplaces list for the last five years."<br>Planned Parenthood: "Planned Parenthood is proud to stand in solidarity with immigrant families and our partners at We Belong Together, the National Domestic Workers Alliance, MomsRising, MamasConPoder, ACLU, United We Dream, MoveOn, and many others." |
| Community engagement events | Care Net: Called and Missioned Pro-Life Men's Conference; Come Alive at the Care Net National Conference<br>Planned Parenthood: Safe, Healthy, Strong Conference |
| Awards providers | Care Net: "Rural, suburban, and urban centers with the most clients at the highest risk for abortion received the Critical Client Award."<br>Planned Parenthood: " Our highest honor, the Planned Parenthood Federation of America Margaret Sanger Award, is presented annually to recognize leadership, excellence, and outstanding contributions to the reproductive health and rights movement." |
| Social justice and care: | Care Net: "The Bible encourages us to speak up for the voiceless and do justice, even when it disrupts the peace of the status quo. Proverbs 31:8-9 says, Speak up for those who cannot speak for themselves; ensure justice for those being crushed. Yes, speak up for the poor and helpless, and see that they get justice."<br>Planned Parenthood: "At Planned Parenthood, we know there's no reproductive freedom without racial justice, and we take seriously our responsibility to create belonging and respect for the millions of patients and partners we serve. We have the fundamental goal to defend health care for the people most harmed by racist and discriminatory systems." |
| Use of social media to combat attacks | Care Net on YouTube: "Life Chat: The Truth about Crisis Pregnancy Centers" with Care Net President Roland Warren. https://www.youtube.com/watch?v=gUVsG2sf3Rk<br>Care Net on X(Twitter): Combats claims of bad faith by using the #badfaithmedicine (nope) hashtag in numerous tweets with stories of Care Net acting in |

| | |
|---|---|
| | good faith.<br>Planned Parenthood on X(Twitter): Responds to Roe v. Wade by using the #BansOffOurBodies to call others to action.<br>Planned Parenthood on YouTube: "Planned Parenthood president slams 'unethical' and 'discriminatory' gag rule on abortion providers" with former President Leana Wen. https://www.youtube.com/watch?v=zO8-_dvEc2U |
| Use of social media to share its cause | Care Net's X(Twitter) @inspirelifenow description: "We envision a culture where those faced with pregnancy decisions are empowered to choose life for their children & abundant life for their families." Its YouTube channel says, "Care Net Centers have saved 886,690 lives since 2008." Its Facebook page says, "Care Net offers compassion, help, and hope to women and men facing pregnancy decisions."<br>Planned Parenthood's X(Twitter) @PPFA and its YouTube channel description: "Hi! We're America's most trusted provider of sexual and reproductive health care, and we think we look pretty good for over 100 years old." Its Facebook page describes it as "a trusted health care provider, an informed educator, a passionate advocate, and a global partner." |
| Diversity in Board composition | Care Net: Male President and CEO; male chairman of the board; 7/11 of the rest of the board members are male; 4 are female.<br>Planned Parenthood: Female president; female chairman of the board; 10/13 of the rest of the board members are female; 3 are male. |
| Ethos | Care Net (2019): "As evidenced by Care Net's Commitment of Care and Competence (which is similar to documents used by other pregnancy center networks) and its Standards of Affiliation, it is clear that pregnancy centers, as a whole, operate under standards and rules that result in consistent, professional services."<br>Planned Parenthood (2022): "Science-backed Education and Resources: As a respected leader in sex education, Planned Parenthood delivers programs, resources, and tools in classrooms, communities, and online that help people make informed choices about their sexuality and relationships, so they can lead full and healthy lives." |
| Pathos | Care Net (2019). Multiple personal testimonies with images of happy families, women, men, children, and babies.<br>Planned Parenthood (2022). Share your story. Multiple personal testimonies with images of happy women. |

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|---|---|
| Logos | Care Net (2019). Impact statement, which includes statistics such as "in the past 11 years, 748,784 lives saved!"<br>Planned Parenthood (2022). "Nearly one in four women* in America will have an abortion by age 45. Every day, people across the country make their own decisions about their pregnancies for reasons that are deeply personal. Politics has no place in these decisions." |

While many of the approaches used by Planned Parenthood and Care Net are similar, their emotional appeals vary. Both appealed more to our moral duties to do what is right (deontological ethical framework) rather than using a utilitarian framework, despite the potential effectiveness of utilitarian frameworks for Planned Parenthood, as noted earlier. Care Net included numerous appeals to religion and the authority of the Bible, while Planned Parenthood used more secular approaches and appealed to commonly held American values. Religious bonding is a way nonprofits use to earn trust among the religious (Tremblay-Boire & Prakash, 2015), which helps build legitimacy. Both appealed to social justice and care for the marginalized, impoverished, or poor, yet Planned Parenthood focused more on racial injustice, while Care Net appealed to those without voices (the unborn). The gender composition of the boards of both companies varied: Male representation is much higher at Care Net than at Planned Parenthood, which is dominated by females. Leaders of each organization have a significant presence on social media, where they respond to attacks on their legitimacy and establish their credibility. To be persuasive, they both use Aristotle's techniques of establishing credibility (ethos), offering emotional appeals through personal stories and testimonies (pathos), and sharing factual information about themselves or their products and services (logos).

## EXTERNAL EVALUATIONS OF PLANNED PARENTHOOD AND PRC LEGITIMACY

What have external evaluations of these two organizations as charities determined about their legitimacy? Table 2 presents proxies for legitimacy by Charity Navigator (2023). Charity Navigator (2023) is "the world's largest and most trusted nonprofit evaluator," with over 11 million annual visitors. It examines IRS Form 990 tax filings and websites to evaluate over 195,000 charities' financial health, accountability, and transparency. The latter criteria include best practices in governance and ethics. To be included in Charity Navigator's star ratings, non-profit organizations must meet all of the following requirements: 501c(3) tax status; at least a million dollar revenue for at least two years; at least seven years old; at least $500,000 in public support; at least one percent of expenses for fundraising for at least three years; and at least one percent of expenses for administrative expenses for at least three years. A 4-star rating indicates exceptional ratings, which exceed industry standards and outperform most charities. A 3-star rating indicates good ratings, which exceed or meet industry standards and perform as well as or better than most charities. In 2018 through 2020, Charity Navigator awarded Care Net 4-star ratings, but in 2021, the Care Net slipped down to a 3-star rating. Planned Parenthood

(Federation) maintained 4-star ratings in all of those years. The CEO and president of Planned Parenthood earned over four times what the CEO and president of Care Net earned, which is likely a function of revenue differences. See Table 2 for other indicators from Charity Navigator.

**Table 2: External Perceptions of the Legitimacy of Care Net and Planned Parenthood**

| Ratings Source | Examples |
|---|---|
| Charity Navigator ratings | Care Net: Leadership and adaptability 100/100; financial 81.77/100; accountability and transparency 100/100; 3 out of 4-star charity rating of 87.10/100, so donors can "give with confidence" to this charity. The president and CEO Roland Warren earned $242,441 in 2020, which is 4.63% of total expenses. The former president and CEO Cecile Richards earned $907,919 in 2020, which is .30 percent of total expenses. Planned Parenthood (Federation of America): Leadership and adaptability 100/100; financial 86.51/100; accountability and transparency 96/100; 4 out of 4-star charity rating of 90.04/100, so donors can "give with confidence" to this charity. |

## THEORETICAL IMPLICATIONS

Our findings have implications for organizational legitimacy theory (Dowling & Pfeffer, 1975) and, more specifically, moral legitimacy (Long & Driscoll, 2008). Moral legitimacy is achieved with conformance to prevailing moral norms in societies. However, these norms change, so organizations lacking an unchanging moral authority (such as Planned Parenthood) must continually adapt to conform. Organizations that claim adherence to an unchanging moral authority, such as well-established religious principles (such as Care Net), may not need as much conformance with societal norms to establish and retain their legitimacy.

Moreover, these two case studies challenge some underlying assumptions in the organizational legitimacy literature. Previous work in this area is predicated on homeostasis in the cultural and organizational environments (Leonard, 2009). The frameworks assume that the moral environment is relatively stable and homogenous. We now know that there are wide discrepancies in moral justifications made throughout society (Thomason et al., 2022). This can be seen in the various aspects of the abortion rights movements and other areas such as fossil fuels production and pharmaceutical patents. We also know that the moral environment is changing quickly. Younger generations bring adapted moral frameworks emphasizing personal rights, environmental protection, and social justice (Thomason et al., 2022). The organizational legitimacy literature can no longer assume that the moral underpinnings of society are homogenous or stable.

The organizational legitimacy literature also assumes that an organization's legitimacy is evaluated primarily through the firm's actions. Observers note the firm's behavior and make

legitimacy judgments using their internal moral frameworks. The literature does not extensively evaluate cases where competitors or activists are actively campaigning to undermine the legitimacy of established players in the industry. In the past, religious organizations or other established moral arbiters may have challenged this legitimacy. However, the lack of environmental homeostasis noted above seems to have increased the communications from rival firms and organizations attempting to undermine the legitimacy of the competition.

## PRACTICAL IMPLICATIONS

Given the role of legitimacy on the survivability of organizations (Dowling & Pfeffer, 1975), Planned Parenthood and Care Net have good reasons to engage in multiple strategies that showcase their legitimacy by appealing to society's core values. Their strategies included securing memberships in industry-related organizations, promoting care for people in need, engaging in actions that help to achieve social justice and care, and awarding stakeholders for actions consistent with their missions. Care Net's approaches incorporated Christian values and beliefs, while Planned Parenthood's approaches were more secular. Both appealed to care, justice, and help for people in need, which align with the moral obligations prevalent in the United States. However, PRCs distinguished themselves by grounding their appeals in an unchanging Biblical authority, while Planned Parenthood's appeals were subject to more dynamic societal values. When the values are the same, both approaches are effective. However, if societal values shift in ways inconsistent with Biblical values, Planned Parenthood could more easily follow the shift, while PRCs could be at a disadvantage.

Based on the evaluations of Charity Navigator, both have maintained 4-star ratings on average between 2018 and 2021. Legitimacy among external stakeholders and the resultant positive image it entails is important to workers' identity as it helps them preserve the continuity of their self-concepts, build self-esteem, and add distinctiveness (Dutton et al., 1994).

To ensure legitimacy in the future and (possibly unintended) appeals to moral deontology, both organizations need to be ethical and truthful in the information they share on their websites and within their organizations. Care Net makes many promises in its donor bill of rights, which include respect, truthfulness, honor, and obedience to God. Planned Parenthood has standards of conduct that promise to avoid conflicts of interest, ensure equal opportunity, and conduct all business with honesty and integrity. Developing, training, rewarding, retaining, and compensating employees who align with established codes of ethics may help cement such codes into the organizations. These codes may further help with the organizations' promotions and marketing efforts. Future studies may want to examine employee alignment with the particular codes employed by these organizations and whether employees are aware of and have been trained and rewarded based on compliance. Future studies may also examine ways employees within these organizations identify themselves within the framework of identity theory (Dutton et al., 1994).

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# ICT AND ACCESS TO JUSTICE: THE ROLE OF TELE-LAW IN EMPOWERING VULNERABLE POPULATIONS

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## ABSTRACT

*Ensuring equitable access to legal services is a core component of safeguarding human rights, enabling individuals to defend their rights, settle disputes, and prevent mistreatment. In India, rural and disadvantaged populations encounter persistent obstacles in accessing the legal system. To address this challenge, the government introduced the Tele-Law initiative. This program integrates Information and Communication Technology (ICT) to offer legal consultations and pre-litigation support via Common Service Centers (CSCs), targeting underserved and remote communities. This study critically evaluates the Tele-Law initiative, focusing on its outreach and impact on marginalized groups such as women, Scheduled Castes (SC), Scheduled Tribes (ST), Other Backward Classes (OBC), and rural citizens.*

*The study draws on data from the Tele-Law Monthly Progress Reports and the population statistics of various Indian states to analyze the correlation between population size and the number of legal cases filed under the scheme. Using multiple regression analysis, the study investigates three key research issues: the influence of sub-population sizes on the number of cases filed, the role of legal infrastructure such as CSCs and Para Legal Volunteers (PLVs), and the effectiveness of the Tele-Law scheme in bridging the justice gap.*

*The analysis highlights significant disparities in access to justice across various sub-populations and regions. While the Tele-Law scheme has made notable progress in reaching SC and ST populations, engagement from women and OBC communities remains below expectations. This paper identifies the potential factors contributing to these trends, particularly the role of rural demographics and the availability of legal resources. The analysis reveals that enhancing legal infrastructure and tackling unique challenges faced by women, particularly in rural regions, would significantly boost the effectiveness of the Tele-Law initiative.*

*Despite the success of the Tele-Law scheme in meeting its objectives, this paper identifies areas for improvement, including enhancing digital literacy, expanding legal infrastructure, and addressing systemic challenges faced by female lawyers. The paper concludes with recommendations for targeted interventions to increase the scheme's reach and effectiveness, particularly for underrepresented groups. By improving access to justice for all citizens, the Tele-Law initiative can serve as a model for other nations seeking to use ICT to bridge the justice gap.*

## INTRODUCTION

The Tele-Law scheme was initiated to bridge the gap in access to justice for rural and marginalized communities in India. United Nations Sustainable Development Goal 16 states that "equal access to justice is essential for protecting the rights of individuals, resolving disputes, and ensuring that vulnerable populations are not marginalized or mistreated" (Rule of Law SDG 16, 2024). Access to justice is a critical component of democratic governance and poverty reduction, as emphasized by the United Nations Development Program (UNDP) and the Millennium Declaration (Rule of Law the three pillars, 2024). The inability to access justice prevents individuals from exercising their rights, challenging discrimination, and holding decision-makers accountable. As noted by the E-Committee report, Information and Communication Technology (ICT) holds significant potential to enhance the efficiency and equity of judicial systems (E- Committee Supreme Court 2005). The Tele-Law scheme seeks to provide legal assistance to citizens at their doorsteps through Common Services Centers (CSCs), leveraging information and communication technology to deliver legal advice and aid to underserved populations.

Since its inception, the Tele-Law scheme has shown significant progress by providing pre-litigation advice to over 79 million people in 250,000 Gram Panchayats as of March 2024 (Annual Report 2024). According to the same report, the Tele-Law scheme faces several challenges ranging from poor internet connectivity in rural areas to increasing number of new districts. Further, the report suggests that the availability of panel lawyers needs to be optimized to reduce the number of unattended cases and building rapport with community members, especially in backward areas, to facilitate the provision of legal services.

The present research attempts to examine the extent to which the Tele-Law scheme succeeded in fulfilling its objective of providing legal services to the vulnerable sections of the Indian population. While the official reports indicate a 100% fulfillment of program goals (Annual Report 2024), we take a look beneath the number presented. This research seeks to identify the factors that explain the program metrics such as cases filed by various sections of the vulnerable population. The insights gained through the analysis form the basis for the recommendations made here to further enhance the effectiveness of the program.

The plan for the rest of the paper is as follows. First, a review of the literature focusing on access to justice (A2J) and ICT is presented, followed by the objectives of the Tele-Law scheme. Next, the specific aims of the study and methodology are described. Results are presented and discussed. Finally, we follow up with recommendations and discuss avenues of future research.

## REVIEW OF LITERATURE

### Concept of Justice and Access to Justice System

The concept of justice encompasses various theories and principles aimed at ensuring fairness, equality, and the protection of rights within a society. Rawls' theory of justice emphasizes that "all social primary goods – liberty and opportunity, income and wealth, and the

social bases of self-respect – are to be distributed equally unless an unequal distribution of any, or all, of these goods is to the advantage of the least favored" (Rawls 1971). Sen's capabilities approach underscores the importance of tailoring justice services to the specific needs of different communities (1992).

Legal aid has evolved significantly over the years, with various countries implementing different models to ensure access to justice for all. The establishment of the Legal Aid Scheme in 1949 aimed to ensure "equality before the law by eliminating personal wealth in determining access to legal advice and representation" (Mayo et al. 2014). This stream of literature highlights the long-standing recognition of the need for accessible legal services. The Five Waves Theory of Macdonald (2005) describes the evolution of legal aid and access to justice initiatives, focusing on different phases of development and reform. These waves include access to lawyers and courts, institutional redesign, demystification of law, preventative law and proactive access to justice. Noting that each wave is associated with a set of barriers, Macdonald proposed a comprehensive strategy with a 'pluralistic approach to the institutions of law and justice' to achieve access to justice (Bailey, Burkell and Reynolds 2013). The Tele-Law scheme adopts this approach.

Access to justice remains a persistent issue in the United States, with a significant gap between those needing legal assistance and those receiving it. Sandefur (2015) identifies the "justice gap," noting that many people experience justice problems but do not receive assistance from attorneys. Surveys indicate that a substantial number of Americans face justiciable events without seeking legal help (Sandefur, 2015). This gap is particularly pronounced among vulnerable and disadvantaged populations, who report higher rates of civil justice issues and more severe negative consequences (Sandefur, 2016). For instance, "poor people were about 30% more likely to report civil justice problems than were people with incomes in the top quintile" (Sandefur, 2016).

Access to justice for rural and marginalized populations is a critical issue worldwide. Studies have shown that these groups often face significant barriers, including economic constraints, lack of awareness, and social discrimination. In India, rural and marginalized communities face unique challenges in accessing justice. Prema, Sundar and Rajvenkatesan (2021) identify economic barriers, social discrimination, and geographical isolation as major hurdles. The Indian Constitution provides special protections to Dalits, including the right to free legal assistance and a speedy trial under Article 21, and the guarantee of free legal aid to the poor and weaker sections of society under Article 39A. However, these provisions are often not effectively implemented according to Prema, Sundar and Venkatesan (2021), who emphasize the persistent caste-based discrimination and the necessity of addressing these issues to achieve SDG 16. The Tele-Law Program aims to mitigate these issues by providing legal services through technology, making it easier for these populations to access legal aid.

Bhupatiraju et al. (2021) conducted a study focusing on the courts in the Bihar state of India, and found significant underrepresentation of Muslims, women, and scheduled castes among lawyers, judges, and petitioners. The study also highlighted the persistent inequality based on caste, gender, and religion, which affects the justice processes and outcomes. Their

research touches on the broader issues of social stratification and discrimination within the judicial system.

The concept of access to justice revolves around the ability of individuals to seek and obtain a remedy through formal or informal institutions of justice for grievances in compliance with human rights standards. Access to justice is a fundamental principle of the rule of law and is essential for the protection of human rights. According to Chapman et al. (2021), approximately 1.4 billion people globally have unmet civil and administrative justice needs. This indicates a substantial justice gap that necessitates innovative solutions to make justice systems more accessible and responsive to the needs of marginalized populations.

**Empirical Studies on Access to Justice**

The literature indicates that justice policies are often disconnected from the needs and capabilities of those facing justice problems. Chapman et al. (2021) argue that data partnerships across the justice ecosystem can maximize efficiencies and better inform strategies for delivering information and aid to vulnerable populations. This involves using administrative data from various institutions to identify service delivery gaps and allocate resources effectively. Furthermore, justice indices, such as the World Justice Project's Rule of Law Index, are being increasingly used to measure good practices and stimulate reform in civil and criminal justice systems globally.

A consistent theme across the literature is the significant data deficit in the civil justice system. Sandefur (2017) highlights the absence of systematic data collection, which hinders the ability to understand and address civil justice issues. Basic information, such as the number of civil cases filed annually and the outcomes of these cases, is not systematically collected (Sandefur, 2017). This lack of data makes it challenging for policymakers, civil society groups, and the public to address the justice gap effectively.

Sandefur (2016) underscores the need for more rigorous, large-scale empirical studies to understand the full scope of civil justice needs and the impact of legal interventions. She notes that existing studies often rely on outdated data and lack the comprehensive data infrastructure seen in other social institutions like education and health (Sandefur, 2016). "In the arena of civil justice, we face a severe data deficit. The kinds of fundamental data infrastructure that exist in our country today for major social institutions... simply do not exist for civil justice" (Sandefur, 2016).

Emerging research in this area includes several empirical studies that provide insights into the effectiveness of legal interventions and the potential of ICT in the justice system. Sela's (2018) study on Online Dispute Resolution (ODR) systems finds that disputants generally have higher satisfaction and perceive greater fairness when interacting with principal ODR systems, particularly when the technology is seen as neutral and unbiased. However, there are concerns about AI's ability to manage complex human interactions, highlighting the need for careful design and implementation of ODR systems (Sela, 2018).

Greiner and Pattanayak (2012) conducted a randomized evaluation of legal assistance programs, finding that offers of representation from a high-quality law school clinic did not

significantly affect the probability of prevailing in unemployment appeals. On the other hand, the representation contributed to a delay in the proceedings. This study highlights the complexities in measuring the effectiveness of legal representation and suggests that many existing studies may overstate the impact due to methodological issues. Greiner and Pattanayak (2012) caution against "overgeneralization and undergeneralization of the unexpected results of their study.

Empirical studies, such as the World Justice Project's Global Insights on Access to Justice (2019), highlight the significant barriers individuals face in accessing justice. For instance, in India, 32% of respondents experienced a legal problem in the past two years, but only 17% were able to access help. Furthermore, 35% found it difficult or nearly impossible to afford the necessary costs to resolve their legal issues. This data underscores the financial and systemic obstacles that impede access to justice for many individuals.

**ICT in Judicial Systems**

Geographical factors, institutional limitations, racial, class, and gender biases, cultural differences, and economic barriers place hurdles in the access to justice. One of the solutions to this problem is the use of technology in the judicial system (Hughes 2013). Starting from the 1990s, with a goal of modernization, U,K. government has integrated telephone and internet-based technology into the provision of legal services (Balmer et al. 2012). From their empirical research, these authors conclude that face-to-face and telephone modes are nearly equal in terms of substantive benefits delivered to citizens. Evaluating the effectiveness of Audio/Visual Conference Systems (AVS) in Malaysian courts, Munirah et al. (2020) conclude that in addition to enhancing access to justice for people from rural areas, these systems show a potential to 'save time, money and resources.' While the COVID-19 pandemic pushed courts at various levels to adopt remote technologies (Bannon and Keith 2021), bringing benefits such as time savings and convenience, the benefits have accrued to those who are technologically capable, whereas those on the other side of the technological divide faced hurdles. When utilizing video-links and other technological solutions to reduce costs and improve efficiencies, it is important to ensure that these technologies are accessible to those with low literacy and limited technological skills. (Hughes, 2013).

ICT has the potential to transform access to justice by making legal processes more efficient and accessible. Sela (2018) explores the role of Online Dispute Resolution systems, both automated and human-powered, in enhancing procedural justice. The study finds that principal ODR systems, which use AI to perform mediation or arbitration tasks, generally lead to higher satisfaction and perceived fairness among disputants. Digital tools can democratize access to legal information, allowing individuals to understand and exercise their rights without necessarily engaging with legal professionals (Sandefur, 2021).

The National Policy and Action Plan for ICT Implementation in the Indian Judiciary (E-Committee Supreme Court 2005) outlined the potential of ICT to transform the judicial system by enhancing efficiency, transparency, and access to justice, which in time, led to the launching of the Tele-Law scheme.

**Tele-Law Scheme**

The primary purpose of the Tele-Law scheme is to enhance legal empowerment by providing legal advice and aid to marginalized sections of society. The scheme aims to:

- *Provide free or low-cost legal aid to ensure inclusion and reduce the time and expense associated with accessing legal services.*
- *Utilize CSCs as the infrastructure for delivering legal aid, ensuring that even the most remote and rural households can receive legal assistance.*
- *Leverage video conferencing and telephone services to connect rural citizens with a panel of lawyers stationed at various locations across India.*

*Since its inception in 2027, the Tele-Law scheme has shown significant progress and fully met its objectives (Annual Report 2024):*

- *The service has provided pre-litigation advice to over 79 million people in 250,000 Gram Panchayats as of March 2024.*
- *In the financial year 2023-24, the scheme provided legal advice to 4.35 million beneficiaries, exceeding the target of 2.9 million cases.*
- *The scheme has onboarded 796 panel lawyers from the National Legal Services Authority (NALSA) and CSC Special Purpose Vehicle (SPV) offices.*

**Evaluation of Civil Justice System in India:**

There is a lack of systematic research on the measurement and evaluation of access to justice in various countries (Chambliss et al. 2016). As traditional measures of access to justice, such as the number of lawyers per capita, are inadequate in rural contexts, Page and Ferrell (2023) propose alternative metrics that account for the specific needs and conditions of rural communities, such as legal vulnerability and access to legal infrastructure. World Justice Project is one of the few attempts at quantifying access to justice. The World Justice Project (WJP) defines the rule of law as a durable system of laws, institutions, norms, and community commitment that delivers four universal principles: accountability, just law, open government, and accessible and impartial justice (WJP 2023). The WJP's research and data, primarily grounded in the Rule of Law Index, measure how the rule of law is experienced and perceived globally. The Index is based on household and expert surveys conducted in numerous countries and jurisdictions, providing current and reliable information to policy makers. The 2023 WJP Rule of Law Index evaluates 142 countries and jurisdictions worldwide. Notably, the rule of law has declined in most countries for the sixth consecutive year. One of the critical components of this index is Civil Justice, defined under Factor 7. This factor measures whether ordinary people can resolve their grievances peacefully and effectively through the civil justice system. It assesses the accessibility, affordability, and fairness of civil justice systems, ensuring they are free from discrimination, corruption, and improper influence by public officials.

Sub-factor 7.1 of the Rule of Law Index measures whether people are aware of available remedies, can access and afford legal advice and representation, and can navigate the court system without incurring unreasonable fees, encountering unreasonable procedural hurdles, or experiencing physical or linguistic barriers. In 2023, India was ranked 131st out of 142 countries in terms of accessibility and affordability of civil justice. This low rank highlights significant challenges in making civil justice accessible and affordable to the general population.

The reviewed literature consistently calls for more rigorous empirical research to address the data deficits and provide a robust evidence base for policymaking. Sandefur (2021) suggests leveraging existing national surveys, such as the National Crime Victimization Survey (NCVS) and the Current Population Survey (CPS), to include questions about civil justice problems. This approach could significantly contribute to understanding and addressing civil justice issues.

Further studies should explore the long-term impacts of ICT on judicial efficiency and the overall effectiveness of digital interventions in reducing barriers to justice. By developing a coherent access to justice research agenda that incorporates empirical evidence and theoretical engagement, the justice system can become more accessible and equitable, ultimately improving outcomes for all individuals (Sandefur, 2021).

The literature highlights the potential of ICT to enhance access to justice and the significant data deficits that hinder a comprehensive understanding of civil justice needs. Empirical studies provide valuable insights but also underscore the need for more rigorous research to inform effective policies and practices. Addressing these gaps through systematic data collection and leveraging technology can help bridge the justice gap and improve access to justice for all.

The existing body of literature on access to justice (A2J) and the role of Information and Communication Technology (ICT) reveals a multifaceted landscape where legal frameworks, social inequities, and technological advancements intersect. Scholars like Rawls (1971) and Sen (1992) lay the philosophical groundwork for justice, emphasizing the need for fairness and the customization of services to meet diverse community needs. These theoretical foundations are echoed in practical assessments, such as Macdonald's Five Waves Theory (2005), which outlines the evolution of legal aid and the persistent barriers faced by marginalized populations. Empirical studies by Sandefur (2015, 2016) further highlight the justice gap, particularly for economically disadvantaged and socially marginalized groups, underscoring the disparity between those who need legal assistance and those who receive it. This gap is exacerbated in rural and isolated regions, as noted by Prema Sundar and Rajvenkatesan (2021), where systemic barriers like economic constraints, social discrimination, and geographical isolation limit access to justice. ICT has emerged as a potential solution, with studies by Balmer et al.. (2012) and Sela (2018) demonstrating the benefits of telephone and online dispute resolution systems. However, these technological interventions are not without challenges; issues of accessibility and digital literacy persist, as highlighted by Hughes (2013) and Bannon and Keith (2021). The Tele-Law scheme in India, designed to leverage ICT for legal aid delivery, embodies the confluence of these theories and empirical findings, offering a unique case study in the ongoing effort to bridge the justice gap.

## STUDY

The present study aims to contribute to the emerging literature on the measurement and assessment of access to justice. Based on its objective of making cost-free "legal aid accessible to the marginalized communities and citizens residing in rural areas," the Tele-Law scheme provides an appropriate context for the assessment of access to justice (Annual Report 2024). Tele-Law scheme was introduced in the Northeastern states and the Union Territory of Jammu and Kashmir as a pilot project in 2017 and by 2023, expanded to 33 states and territories in India. The states/territories are diverse and with varying proportion of vulnerable groups including women, and those belonging to Scheduled Caste (SC), Scheduled Tribe (ST), Other Backward Caste (OBC) populations. Tele-Law scheme has met or exceeded all of its objectives during the last year (Annual Report 2024) and enhanced access to justice by helping the target populations file 6,574,265 cases. This study evaluates the extent to which the Tele-Law scheme served the different populations by analyzing the number of cases by the various target populations. The following research issues are explored in the study.

*Research Issue 1: Does the size of the sub-population affect the number of cases filed by the group?*

*Research Issue 2: Do population and sub-population sizes influence the number of cases filed by each sub-population?*

*Research Issue 3: Does the number of lawyers and Para Legal Volunteers (PLVs) increase the number of cases filed by the various sub-populations?*

### Methodology:

Data for this study were drawn from the Tele-Law Monthly Progress Reports, focusing on the volume of cases submitted by various sub-populations across India. Additional demographic information, including figures for women, Scheduled Castes (SC), Scheduled Tribes (ST), Other Backward Classes (OBC), and the general population was sourced from official Indian government reports. The database consists of data for the 33 states and union territories identified in the Tele-Law reports. Data were analyzed using the SPSS software. To explore the research issues identified earlier, we computed ratios that reveal the cases filed to population size relationships and multiple regression analyses.

The use of ratios and multiple regression analysis in this study is strategically chosen to provide a comprehensive and nuanced understanding of the effectiveness of the Tele-Law scheme in India. The ratio of cases filed to population size is employed as a key metric because it allows for a normalized comparison across different states and sub-populations, accounting for the inherent differences in population sizes. This method is particularly useful in highlighting the proportional engagement of various demographic groups with the legal system, offering insights

into whether certain populations are over- or under-represented in terms of access to legal services. Multiple regression analysis, on the other hand, is utilized to explore the complex relationships between the number of cases filed and a range of predictor variables including population demographics and the availability of legal infrastructure. This statistical technique is well-suited for assessing the combined effect of multiple factors, allowing the study to isolate the impact of each variable while controlling for others. By employing regression analysis, the research is able to quantify the extent to which factors like rural population size, the number of Community Service Centers (CSCs), and the availability of lawyers influence the accessibility of legal services. Together, these methods provide a robust analytical framework that not only answers the research questions, but also offers actionable insights for enhancing the Tele-Law scheme's effectiveness.

The results of the analyses are described below.

**Results:**

To examine research issue 1, whether the size of the sub-population affects the number of cases filed by the vulnerable groups, ratios of cases filed by the various sub-populations were computed. First, out of all cases filed in 2023 through the Tele-Law scheme, the percentage of cases filed by a sub-group, for instance women, was computed. Then, the percentage of women in the population was calculated. By taking a ratio of these two numbers, we created an index termed here as the "ratio of cases filed to population size." Table 1 shows the ratios for the cases filed by women, as well as the SC, ST, OBC and General caste groups. If the ratio is 1.0, it is inferred that the number of cases filed by a sub-group is proportionate to the size of the sub-population. Numbers above 1 indicate that the sub-group is over-represented whereas numbers below 1.0 indicate the under-representation of the group in terms of the number of cases filed.

**Table 1**
**Ratio of Cases Filed to Population Size by State and Sub-Population Groups**

| State | Ratio of Cases Filed to Population Size | | | | |
|---|---|---|---|---|---|
| | Female | General | OBC | SC | ST |
| Andaman and Nicobar | 0.87 | 0.15 | 0.62 | 62.74 | 0.27 |
| Andhra Pradesh | 0.93 | 1.36 | 0.66 | 1.17 | 2.22 |
| Arunachal Pradesh | 1.26 | 2.3 | 3.47 | 6.04 | 0.22 |
| Assam | 0.72 | 1.36 | 0.67 | 0.88 | 0.44 |
| Bihar | 0.94 | 0.64 | 0.78 | 1.66 | 1.79 |
| Chadigarh | 1.36 | 0.23 | 0.89 | 2.74 | 15.15 |
| Chattisgarh | 0.71 | 0.83 | 0.82 | 1.4 | 1.09 |
| Dadra and | 0.73 | 2.87 | 0.39 | 1.41 | 0.16 |
| Delhi | 0.97 | 0.28 | 2.54 | 1.37 | 1.4 |
| Goa | 0.82 | 0.78 | 0.62 | 6.63 | 0.56 |
| Gujarat | 0.61 | 0.52 | 0.56 | 1.26 | 2.85 |

**Table 1**
**Ratio of Cases Filed to Population Size by State and Sub-Population Groups**

| State | Ratio of Cases Filed to Population Size | | | | |
|---|---|---|---|---|---|
| | Female | General | OBC | SC | ST |
| Haryana | 0.58 | 0.45 | 1.52 | 1.11 | 5.12 |
| Himachal Pradesh | 0.68 | 0.57 | 1.24 | 1.56 | 2.31 |
| Jammu & Kashmir | 0.62 | 0.71 | 1.53 | 2.03 | 1.62 |
| Jharkhand | 0.8 | 0.89 | 1.2 | 1.13 | 0.66 |
| Karnataka | 0.91 | 2.39 | 0.64 | 1.2 | 0.64 |
| Kerala | 1.12 | 0.83 | 1.00 | 1.39 | 2.22 |
| Ladakh | 0.89 | 0.81 | 5.53 | 10.73 | 0.63 |
| Lakshadweep | 0.92 | 1.2 | 2.72 | 27.52 | 0 |
| Madhya Pradesh | 0.62 | 0.66 | 0.81 | 2.03 | 0.83 |
| Maharashtra | 0.64 | 0.4 | 0.6 | 2.42 | 2.22 |
| Manipur | 0.8 | 0.35 | 1.89 | 1.47 | 1.34 |
| Meghalaya | 0.89 | 1.33 | 1.66 | 1.55 | 0.95 |
| Mizoram | 1.01 | 4.96 | 25.98 | 2.96 | 0.61 |
| Nagaland | 0.94 | 0.96 | 2.03 | 0.81 | 1 |
| Odisha | 0.67 | 0.74 | 0.72 | 1.75 | 1.02 |
| Puducherry | 0.7 | 3.69 | 0.61 | 1.71 | 7.98 |
| Punjab | 0.78 | 0.58 | 0.52 | 1.4 | 11.89 |
| Rajasthan | 0.64 | 1.19 | 0.62 | 1.37 | 0.87 |
| Sikkim | 0.9 | 2.18 | 0.54 | 6.28 | 0.52 |
| Tamil Nadu | 1.04 | 12.53 | 0.51 | 0.92 | 2.76 |
| Telangana | 0.68 | 1.48 | 0.77 | 1.09 | 1.64 |
| Tripura | 0.85 | 0.62 | 1.45 | 1.28 | 0.87 |
| Uttar Pradesh | 0.82 | 0.89 | 0.71 | 1.51 | 3.04 |
| Uttarakhand | 0.6 | 0.41 | 1.1 | 2.5 | 1.65 |
| West Bengal | 0.81 | 0.86 | 1.72 | 1.04 | 0.62 |
| Total | 0.74 | 0.82 | 0.74 | 1.47 | 1.57 |

Multiple regression analysis was employed to examine research issue 2, which asks whether the number of cases filed by the different sub-populations as well as the total number of cases filed through the Tele-Law scheme are influenced by the total population size as well as the sub-population sizes. The set of predictor variables included size of state/UT population as well as the size of rural, women, and caste group sub-populations. The dependent variables include the total number of cases filed through the Tele-Law scheme, the number of cases filed by women and the various caste categories. Stepwise regression was used to evaluate the influence of population size and sub-population size as predictors of the number of cases filed. The results of the regression analyses are provided in the table below.

**Table 2**
**Regression: Influence of population size on the Number of Cases Filed**

| Dependent Variable | Independent Variables | Adjusted R-Square | Statistically Significant* Variables and Beta Values |
|---|---|---|---|
| Female Cases | Total Population<br>Female Population<br>Rural Population<br>SC Population<br>ST Population<br>OBC Population<br>General Population | 0.856 | Rural Population (0.927) |
| SC Cases | Total Population<br>Female Population<br>Rural Population<br>SC Population<br>ST Population<br>OBC Population<br>General Population | 0.789 | Rural Population (0.892) |
| ST Cases | Total Population<br>Female Population<br>Rural Population<br>SC Population<br>ST Population<br>OBC Population<br>General Population | 0.772 | ST Population (0.882) |
| OBC Cases | Total Population<br>Female Population<br>Rural Population<br>SC Population<br>ST Population<br>OBC Population<br>General Population | 0.830 | Rural Population (1.052)<br>General Population (-0.367)<br>ST Population (0.224) |
| General Cases | Total Population<br>Female Population<br>Rural Population<br>SC Population<br>ST Population<br>OBC Population<br>General Population | 0.504 | Rural Population (0.720) |
| Total Cases | Total Population<br>Female Population<br>Rural Population<br>SC Population<br>ST Population<br>OBC Population<br>General Population<br>CSCs | 0.826 | Rural Population (0.762)<br>ST Population (0.256) |

*Significant at the 0.01 level

Community Service Centers (CSCs), lawyers and Para Legal Volunteers (PLVs) constitute the infrastructure through which the Tele-Law scheme provides access to justice for the poor and vulnerable sections of the population. Research issue 3 raises a question regarding the influence of these variables on the number of cases filed, in combination with population and sub-population sizes. Table 3 shows the results of stepwise regression analyses.

**Table 3**
**Regression: Influence of population size and Legal Infrastructure on the Number of Cases Filed**

| Dependent Variable | Independent Variables | Adjusted R-Square | Statistically Significant* Variables and Beta Values |
|---|---|---|---|
| Female Cases | Total Population<br>Female Population<br>Rural Population<br>SC Population<br>ST Population<br>OBC Population<br>General Population<br>CSCs<br>All Lawyers<br>Female Lawyers<br>PLVs | 0.927 | Rural Population (0.377)<br>CSCs (0.378)<br>PLVs (0.265) |
| SC Cases | Total Population<br>Female Population<br>Rural Population<br>SC Population<br>ST Population<br>OBC Population<br>General Population<br>CSCs<br>All Lawyers<br>Female Lawyers<br>PLVs | 0.918 | CSCs (0.546)<br>PLVs (0.456) |
| ST Cases | Total Population<br>Female Population<br>Rural Population<br>SC Population<br>ST Population<br>OBC Population<br>General Population<br>CSCs<br>All Lawyers<br>Female Lawyers<br>PLVs | 0.865 | ST Population (0.737)<br>CSCs (0.648)<br>SC Population (-0.444) |
| OBC Cases | Total Population<br>Female Population<br>Rural Population<br>SC Population | 0.884 | Rural Population (0.574)<br>General Population (-0.314)<br>All Lawyers (1.051)<br>Female Lawyers (-0.503) |

**Table 3**
**Regression: Influence of population size and Legal Infrastructure on the Number of Cases Filed**

| Dependent Variable | Independent Variables | Adjusted R-Square | Statistically Significant* Variables and Beta Values |
|---|---|---|---|
| | ST Population<br>OBC Population<br>General Population<br>CSCs<br>All Lawyers<br>Female Lawyers<br>PLVs | | |
| General Cases | Total Population<br>Female Population<br>Rural Population<br>SC Population<br>ST Population<br>OBC Population<br>General Population<br>CSCs<br>All Lawyers<br>Female Lawyers<br>PLVs | 0.548 | All Lawyers (0.751) |
| Total Cases | Total Population<br>Female Population<br>Rural Population<br>SC Population<br>ST Population<br>OBC Population<br>General Population<br>CSCs<br>All Lawyers<br>Female Lawyers<br>PLVs | 0.927 | All Lawyers (1.137)<br>Female Lawyers (-0.462)<br>PLVs (0.259) |

*Significant at the 0.01 level

## DISCUSSION

The Tele-Law scheme has met all of its goals (Annual Report 2024) and enhanced access to justice for the rural and other vulnerable populations with 6,574,265 cases filed through the scheme in 2023 alone. Results from the analyses of cases filed provide insights into the effectiveness of the Tele-Law scheme. At the national level, the cases filed to the sub-population size ratios show greater engagement of SC and ST populations (ratios of 1.47 and 1.57 respectively) and a lower participation of the female (0.74), OBC (0.74) and General population groups. When we examine cases filed by sub-groups, the performance of States and Union Territories shows interesting differences. For instance, Chandigarh shows the highest ratio of cases filed by females (1.36) and ST sub-group (15.15), but the shows the lowest ratio (0.23) for the General caste group. As many of the extreme (high and low) ratios are associated with the

smaller states and UTs, it is reasonable to characterize them as outliers. Tele-Law administrators need to focus on areas associated with small ratios to ensure effectiveness of the scheme.

Results from the regression analyses, with number of cases being explained by the population sizes of the various groups, show the influence of the size of various populations. Adjusted R-Square values indicate that 82.60% of the variation in the number of cases is explained by these variables. The influence of the population size variables is at the highest (85.60% of variance explained) in the number of cases filed by females and lowest (50.40%) in the case of general caste category.

Among the explanatory variables, size of the rural population emerges as the strongest influence. For Female, SC, OBC, and Total Cases in Table 2, the Beta values are high (ranging from 0.720 to 1.052), indicating that an increase in the rural population is strongly associated with an increase in the number of cases filed. Further, it is the only statistically significant predictor of cases filed by female, SC and general groups. ST population emerged as a strong predictor with a statistically significant influence on the total cases filed as well as those filed by ST and OBC groups.

When the legal infrastructure-related variables were added to the previous predictors, the explanatory power of the regression models in explaining the variance in the number of cases filed increased in each category. The biggest improvement in R-Square is seen in the SC (12.90%) category and in the total number of cases (10.10%) filed through the Tele-Law scheme. At 92.70%, our model explains a whopping amount of the variance in cases filed by females. The least amount of variance is explained in the number of cases filed by the general category group.

The influence of the rural population is reduced when additional variables (CSCs, lawyers, and PLVs) are included, suggesting that the presence of these resources mitigates the influence of rural population density. In fact, the three new variables, namely CSCs, total lawyers and PLVs, emerged as the strongest influences in explaining the number of cases filed by each sub-group as well as the total number of cases filed. CSCs are a statistically significant predictor for the cases filed by SC, ST and female citizens. Number of Lawyers emerges as a significant predictor in explaining the total number of cases filed as well as the cases filed by the OBC and general groups, whereas the role of PLVs is significant for explaining the variation in total cases and the cases filed by the female and SC groups.

Standardized coefficient (Beta) values indicate that CSCs play a critical role in facilitating access to legal services for the SC (0.546), ST (0.648) and female (0.378) groups. PLVs have a positive Beta in Female Cases (0.265), SC Cases (0.456), and Total Cases (0.259), highlighting the importance of paralegal volunteers in supporting legal processes. For OBC Cases (1.051), General Cases (0.751), and Total Cases (1.137) in Table 3, the Beta values are substantial, indicating that the availability of lawyers significantly boosts the number of cases filed. The negative Beta values for Female Lawyers in OBC Cases (-0.503) and Total Cases (-0.462) suggest potential systemic issues or barriers that female lawyers face, affecting their effectiveness in increasing case filings.

While the literature provides a robust understanding of the barriers to justice and the potential of ICT to mitigate these challenges, there remains a significant gap in empirical

evaluations that assess the effectiveness of these interventions in diverse socio-cultural contexts, particularly in rural and marginalized communities. Most studies have focused on either the theoretical underpinnings of access to justice or the broad outcomes of ICT implementations without delving into the nuanced impacts on specific vulnerable populations. The present study addresses this gap by offering a granular analysis of the Tele-Law scheme's effectiveness across different sub-populations in India. By examining the relationship between population demographics, legal infrastructure, and the number of cases filed, this research provides a detailed evaluation of how well the program meets its goals of inclusivity and accessibility. Moreover, this study expands on the existing literature by introducing metrics like the "ratio of cases filed to population size", which offers a more precise measure of the program's reach and equity. Through this approach, the research not only contributes to a deeper understanding of the Tele-Law scheme's impact but also sets the stage for future studies that can build on these findings to further refine and enhance access to justice initiatives worldwide.

## RECOMMENDATIONS

Our data on the ratio of cases filed to population size provides valuable insights into the engagement of different sub-population groups with the legal system across various states in India. By understanding these patterns, Tele-Law administrators can implement targeted interventions to enhance access to justice for all sub-populations, ensuring the scheme's effectiveness and equity. Targeted interventions include women-specific support services and legal aid clinics in low-ratio states to address social and economic barriers, strengthening the presence of legal aid centers and streamlining of processes to make legal services more accessible to the general population, working with community leaders and organizations to build trust and ensure OBC populations are aware of and can access legal services, providing legal education and empowerment programs to increase SC population's engagement with the legal system and investments in legal infrastructure in geographically isolated areas to improve access for ST populations.

In regard to the legal infrastructure, appropriate actions include an increase in the number and operational efficiency of CSCs, particularly in rural and underserved areas, to improve access to legal services. Expanding the number of lawyers and PLVs to ensure sufficient legal support across all population groups, with a focus on marginalized communities, and addressing systemic challenges faced by female lawyers through targeted training, support programs, and initiatives aimed at enhancing their effectiveness within the legal system are crucial to the effectiveness of the scheme. Another effective action would be to intensify outreach efforts in rural areas to ensure populations are aware of and can utilize available legal services.

Enhancing digital infrastructure is crucial for improving the effectiveness and reach of the Tele-Law scheme, especially in low-ratio and underserved states. Digital infrastructure can be enhanced through investments in equipment (computers, scanners and other equipment) as well as bandwidth and wi-fi services used to connect the CSCs. In the next phase, emphasis should be placed on the installation of high-quality video conferencing systems and training to

facilitate remote legal consultations and hearings. Development of mobile apps will enhance access to justice and make the process more efficient.

Enhancing the digital literacy of targeted populations is critical to the success of the Tele-Law program. The training should also target CSC staff and include basic knowledge of legal processes. Successful implementation of the program also requires continuous monitoring and evaluation of the system to track key metrics with a focus on the identification of areas for improvement.

## FUTURE RESEARCH

One avenue for future research would be to evaluate the effectiveness of the Tele-Law scheme, is to look beyond access to justice and calculate the ratio of cases that have been resolved out of the cases filed. Access to CSC-level data in contrast to the state-level data used in the present study will lead to more fine-grained analysis and provide information on the effectiveness of the CSCs. This will allow states to increase the effectiveness of the Tele-Law scheme by making necessary changes to training and processes at the CSC level. Management of cases by PLVs and lawyers and the efficiency of the judicial system in resolving cases filed through the Tele-Law scheme should be evaluated to develop strategies to strengthen the scheme. Future research should also explore the financial efficiency of the services rendered, by calculating the average cost incurred by the CSCs to resolve a case and the amount of money beneficiaries save by using CSC services compared to traditional legal services.

## CONCLUSION

The comparison of WJP data from 2020 to 2023 reveals a decline in the performance of India's civil justice system, despite efforts to expand access through the Tele-Law scheme. Addressing the identified issues through targeted interventions and improvements can help enhance the effectiveness of legal aid services, improve access to justice, and ensure that the civil justice system is equitable and efficient.

Our analysis indicates that several states, particularly those with lower ratios of cases filed to population size, need enhanced CSC infrastructure. By focusing on these states and implementing targeted CSC services, the Tele-Law scheme can improve access to justice for all sub-populations, ensuring that marginalized groups receive the legal support they need. PLVs are vital in bridging the gap between marginalized communities and the legal system, ensuring that the objectives of the Tele-Law scheme are met. By continuing to support and expand the role of PLVs, the Tele-Law scheme can further enhance access to justice and ensure that legal aid reaches those who need it most.

Measuring the impact of the Tele-Law scheme requires a comprehensive approach that includes both quantitative and qualitative metrics. By tracking key performance indicators and gathering feedback from beneficiaries and stakeholders, the scheme's effectiveness can be assessed and continuously improved to ensure that it provides meaningful access to justice for marginalized communities in India.

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