

Identify Smart Campus' Features and Factors Which Affect Student Satisfaction in Using Its Services

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Abstract: This study aims to identify the features of smart campus services on several campuses in the Makassar area as well as factors that affect student satisfaction using them. The unit of analysis includes all students at universities in Makassar. The research design uses qualitative design. Data was collected through a series of semi-structured interviews with seven (7) participants including students, lecturers, and technology infrastructure experts. Data was analyzed using thematic analysis with a cross-case analysis approach including open coding, axial coding and selective coding. On identifying factors that affect student satisfaction in accessing smart campus service features, five factors were found, namely: (1) factors of smart campus service types, some of the most popular are e-learning, digital payments, campus mobile applications, smart libraries, and campus internet, (2) the service display factors include user-friendly, service responsiveness, attractive interface, completeness of service, and interactivity, (3) administrative efficiency factors, with indicators of cost-effective, energy, time, lecture management, and up to date information, (4) environmental factors, indicators of providing new and supportive experiences, built technology infrastructure, quality of service, and convenience include data security and student privacy, (5) the caring factor of students needs describes the ability of the service to care for student needs, including attention to social aspects of services, service centers, solutions and understanding student needs.

Abstrak: Penelitian ini bertujuan untuk mengidentifikasi fitur-fitur layanan smart campus di beberapa kampus di wilayah Makassar serta faktor-faktor yang mempengaruhi kepuasan mahasiswa menggunakannya. Unit analisis mencakup semua mahasiswa di perguruan tinggi di Makassar. Desain penelitian menggunakan desain kualitatif. Data dikumpulkan melalui serangkaian wawancara semi terstruktur dengan tujuh (7) peserta termasuk mahasiswa, dosen, dan pakar infrastruktur teknologi. Data dianalisis menggunakan analisis tematik dengan pendekatan analisis lintas kasus meliputi open coding, axial coding dan selective coding. Pada identifikasi faktor-faktor yang mempengaruhi kepuasan mahasiswa dalam mengakses fitur layanan smart campus, ditemukan lima faktor yaitu: (1) faktor jenis layanan smart campus, beberapa yang paling populer adalah e-learning, pembayaran digital, aplikasi mobile kampus, smart library, dan internet kampus, (2) faktor display layanan meliputi user-friendly, responsivitas layanan, interface menarik, kelengkapan layanan, dan interaktivitas, (3) faktor efisiensi administrasi, dengan indikator hemat biaya, energi, waktu, manajemen perkuliahan, dan informasi terkini, (4) faktor lingkungan, indikator memberikan pengalaman baru dan mendukung, infrastruktur teknologi, kualitas layanan, dan kenyamanan meliputi keamanan data dan privasi mahasiswa, (5) faktor kepedulian kebutuhan mahasiswa menggambarkan kemampuan pelayanan dalam merawat kebutuhan mahasiswa, termasuk perhatian pada aspek sosial layanan, pusat layanan, solusi dan memahami kebutuhan siswa.



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INTRODUCTION

Satisfaction is the result of meeting different levels of human needs. In his hierarchy of needs, Maslow (1943) described five levels of needs, ranging from physical needs (food needs, shelter) to psychological needs (the need for a sense of being valued, recognized, and reaching one's potential). Kotler (2010), a well-known marketing expert, attributes customer satisfaction to the quality of products and services. According to him, customer satisfaction is created when customer expectations are met or even exceeded by the quality of products or services provided by a company. Deming (1986), a quality management expert, states that customer satisfaction can be achieved through continuous improvement and a focus on quality. Deming emphasized the importance of understanding customer needs and wants to increase customer satisfaction and retention.

This concept of satisfaction is part of the many views and theories that exist about satisfaction. Each expert has a unique perspective and approach in explaining the concept of satisfaction based on his or her area of expertise. This notion of satisfaction continues to grow along with the development of science and research.

Education today faces a significant paradigm shift. The conventional learning model that is centered on lecturers as authority holders is being replaced by a more interactive and collaborative approach. Smart campus is an innovative solution that can increase learning effectiveness and prepare students for future demands. In an era of globalization and fierce competition, educational institutions need to adapt to technological changes and student expectations. Smart Campus helps educational institutions to increase competitiveness by providing the latest infrastructure and technology services that can attract prospective students and meet their needs.

The Central Statistics Agency states that there are 7.6 million students in Indonesia (2021), which is dominated by the millennial generation. The millennial generation is a generation born in the early

1980s to 2000s. This generation uses a lot of communication technology such as social media, content, etc. In addition, generally the millennial generation always wants something ideal and fast.

According to surveys, the average generation can only stay away from gadgets for 23 minutes. As observed at this time, when students gather, they are not busy chatting, but busy updating status while scrolling through social media accounts with the caption "Quality time with bestie" but still their mobile phones do not leave their hands. Not only during quality time with friends, when family gatherings, mobile phones also do not leave his hands. This fact must be faced by universities, and this must also be utilized by universities, such as utilization in academic information systems, which should already have a mobile version, so that millennial students want to use it.

Students in the millennial era are generally dominated by young people who have distinctive characteristics. Unlike the previous generation of students who tended to be anti-state and involved in various political movements that opposed the status quo, in the current era most students tend to be apolitical, like to travel, and are not interested in working in large companies that require them to regularly work in offices.

Millennial students are new figures of young people who aspire to be involved in various anti-mainstream jobs, which do not require them to routinely and rigidly work based on office hours. Today's students are young people who aspire to enter and can be involved in the world of start-ups or flexible work, can be done from anywhere, whether at home, a café, or a mobile office.

One important thing that millennials learn is the uncertainty of national and global economic conditions that often threaten the survival of large companies that are slow to take advantage of the development of information technology (IT). Their knowledge of the real economic situation that comes from various online sites is what makes young people now no longer enthusiastic about engaging in conventional work. For millennial students, the doors to pursue their dreams are now

more open and differentiated – depending on whether they are ready or not.

Facing changes in student characteristics in the millennial era, universities inevitably have to place students as the subject or center of the entire learning process developed. Students in the millennial era are not empty vessels that constantly need to be filled with various knowledge. They must be understood as individuals or subjects that have their own uniqueness and creativity. First, in the millennial era, it is no longer possible to use learning methods that homogenize students. Campuses that fall into more commercial considerations and pursue the target of accepting new students in large numbers who should undoubtedly be trapped in a classical, mass learning process, and ignore the potential per student unit. Second, universities are no longer enough to focus only on developing students' professional skills and scientific knowledge. The campus must also be able to build a solid foundation for the growth of students' critical attitude. As part of the net generation, students in the millennial era generally have very open access to various sources of information, which will be capital for the development of an essential critical attitude. Third, universities in the millennial era are also required to be able to assist students to grow into figures who always have sensitivity, care, and empathy for others so that they do not grow as asocial, indifferent, and solitary figures. Therefore, universities should start implementing qualified technology to improve the quality of their services in order to achieve student satisfaction.

The importance of smart campuses in increasing student satisfaction has become a major concern for educational institutions. Based on research and analysis, here are some reasons why smart campus is a crucial aspect in increasing student satisfaction:

1. More interactive and engaging learning experiences:

Technology in smart campuses allows universities to present learning content in a more interactive and engaging manner. The use of technology such as e-learning platforms, simulations, and multimedia media helps create a more

dynamic and relevant learning experience for students (Zhang et al, 2004)

2. Accessibility and Mobility: Smart campuses give students easy access to a wide range of academic resources through mobile apps and integrated platforms. Students can easily access campus information, lecture schedules, and learning materials from their mobile devices, increasing flexibility and mobility in teaching and learning activities (Pimmer, 2014).
3. Administrative Efficiency: Smart campus automates campus administration processes, such as enrollment, student record management, and assessment processes. The application of this technology reduces administrative burden, improves data accuracy, and allows staff and lecturers to focus more on academic services and student development (Gerven et al, 2006).
4. Interaction and Engagement: Smart campuses provide opportunities to increase interaction between students, faculty, and staff through various technology platforms, such as online discussion forums, e-mail, and social media tools. This increases student engagement in the learning process and helps form inclusive learning communities (Junco, 2015)
5. More Advanced Campus Facilities: Smart campuses also include the development of more advanced campus facilities, such as interactive learning spaces, technology labs, and digital libraries. This modern and integrated learning environment creates a conducive atmosphere for students in achieving academic achievement and self-development (Oblinger, 2006).

Through the adoption of the Smart campus concept, educational institutions can create a learning environment that is innovative, adaptive, and meets student expectations. Increased student satisfaction will have a positive impact on student

retention, academic achievement, and overall college reputation.

The level of student satisfaction in implementing smart campus can vary depending on the level of readiness and success of the campus in implementing the technology. Therefore, it is important for universities to actively collect feedback from students and strive to continuously improve and optimize their experience in a smart campus environment.

Smart campus is a set of smart technologies in an academic environment, such as universities, institutes, high schools, polytechnics and the like that connect hardware and software with its users, both students, lecturers, and the entire academic community to support a better teaching-learning process. Some examples of ongoing developments related to smart campus and educational technology are:

1. Platform and Application Development: Smart campus platforms and applications continue to experience improvements and feature improvements to provide a more interactive and efficient learning experience for students.
2. Artificial Intelligence (AI) Integration: AI is increasingly being integrated into smart campus platforms to provide more personalized data analysis and learning recommendations for students.
3. Virtual Reality and Augmented Reality: The use of VR and AR technology within smart campus environments is growing to enhance immersive learning experiences.
4. Development of Internet of Things (IoT): IoT is increasingly being applied on campuses to improve efficiency in resource management, such as energy use and facility management.
5. Use of Big Data and Predictive Analytics: More educational institutions are using big data and predictive analytics to identify trends and provide smarter solutions to improve learning effectiveness.
6. Hybrid Learning Model Development: The COVID-19 pandemic has affected learning trends, with more institutions developing hybrid learning models

that combine face-to-face learning with online learning.

7. Focus on Student Wellbeing: Educational institutions are increasingly paying attention to student well-being and implementing technology that can help reduce stress and improve mental health.

There are already quite a lot of campuses, both public and private, in the city of Makassar that implement smart campuses. In general, there is already an academic service administration system, for example, there is already a system for filling out Study Plan Cards and printing Study Results Cards. However, on the other hand, some campuses do not yet have a learning management system (LMS), campus repository, conventional library system, integrated information system such as financial information system, industrial practice information system, curriculum information system, Research and Service management information system, student final project management information system, quality assurance information system, agency management information system information system Student Executive, and so on. Whereas with these systems, the quality of higher education services becomes more effective and efficient. The smart campus system in its implementation and implementation is not easy because it involves many means that must be realized. In addition, the development of pre-existing systems has not been integrated. According to Jogiyanto (2005) information systems are strategic weapons because they can improve and accelerate services in an organization.

METHODS

The research design that will be used in this study is a qualitative research model. This design begins with qualitative data collection. The purpose of qualitative data collection is to explore existing phenomena first (Creswell, 2011). Researchers use this design when there are instruments, variables, and measures that may not be known or available to the population under study. The population of this study includes students, lecturer, and the expert of

technology in the city of Makassar with by purposive sampling techniques were used with 7 respondents.

This research will be conducted in Makassar City where this occupation was chosen because universities in Eastern Indonesia are dominated by universities in Makassar City. In addition, the conditions of implementing a smart campus are very possible to be carried out in the city of Makassar because of the adequate technological infrastructure.

In this study, researchers used interview guidelines to informants with semistructured interview techniques. The purpose of this type of interview is to find problems more openly, where the interviewee is asked for their opinions and ideas (Sugiyono, 2011).

The interview guidelines in the form of a list of questions to be used as a reference in obtaining information from participants consist of 4 stages, namely:

1. The opening question is in the form of a greeting,
2. Transition questions to ask about willingness to be interviewed,
3. Core questions, consisting of the following questions:
 - a) What do you think about the use of smart campus technology at your college?
 - b) In your opinion, what is the most useful smart campus feature?
 - c) What are some of the challenges you experience in using your smart campus technology?
 - d) How do you assess the technical support and assistance provided by universities regarding smart campus technology?
 - e) Have there been any positive changes in your academic or personal life after using smart campus technology?
4. Closing questions, in the form of questions that elicit advice from informants.

Instruments in quantitative research will be prepared after thematic analysis is carried out on qualitative data obtained previously.

The method that will be used to collect data in this study is to conduct interviews. Interview is a data collection technique that involves two people, namely the first party as a resource person and the second party as an interviewer. This data collection is where the second party will ask questions about the main topic that is the research question, while the first party who knows about the main topic is willing to answer questions without coercion and honestly say it according to existing facts and phenomena.

Sekaran and Bougie (2017) argue: "Researchers can tailor questions as needed, classify doubts and ensure that the responses received are understood appropriately, by repeating or paraphrasing questions". Data analysis is the process of processing data to be used as useful information in overcoming existing problems. The data analysis to be used in this study is thematic analysis. Thematic analysis is one of the popular qualitative data analysis methods. Braun and Clarke (2013) suggest that thematic analysis is a data analysis technique in qualitative research that can identify, analyze, and report patterns displayed in data and interpret them in more detail and complete. These themes can be identified, encoded inductively (data driven) from raw qualitative data (interview transcripts, sound recordings, videos) or deductively (theory driven) based on theory and previous research results (Boyatzis, 1998). So in this study, researchers will use thematic analysis to determine the number of themes collected in the data obtained, namely from the phenomena studied, and connect these themes systematically into research data. This thematic analysis will use Cross Case-Analysis Approach (Laforest, 2009) which consists of three (3) stages, namely:

1. Open Coding is used for identifying, labeling/naming, categorizing and describing phenomena that have been studied.
2. Axial Coding is used of process of connecting codes that have been grouped/categorized during open coding.
3. Selective Coding is the process of forming basic ideas (core categories) which are then associated with other

categories, so that in the end a whole theme is formed in accordance with the phenomena that occur.

RESULTS AND DISCUSSION

Open Coding is a process of recapitulation and conceptualization of data. This stage begins when researchers obtain data and then test it. Each data will be labeled. After the recapitulation process was carried out by the researcher from the results of the participant interviews that had been collected, the researcher found 84 recapitulation data to be processed to the *axial coding* stage. The following open coding data assemblies are shown in table 5.1:

Table 1 Open Coding

No.	Keywords/ <i>Open Coding</i>	Code
1.	Lots of convenience	1A
2.	Access academic and administrative information	1B
3.	Cost-effective	1C
4.	Save effort	1D
5.	Complete features	1E
6.	Notifications from colleges	1F
7.	Real-time information availability	1G
8.	Easily check schedules, announcements, exam results	1H
9.	Interactive interface pages	1D
10.	Easy to use (<i>user friendly</i>)	1K
11.	Service system responsiveness	1L
12.	Get help as soon as possible if there are technical problems	1M
13.	Stable internet connection in campus environment	1N
14.	Platform e-learning	2A
15.	Access online course materials	2B
16.	Digital library system	2C
17.	Easy to find references	2D
18.	Fast and easy online payments	2E
19.	Easy access from a variety of devices	2F

20.	Completeness of features and relevant	2G
21.	Data security	2H
22.	Good technical support	2I
23.	Interaction and communication with lecturers	2D
24.	Online discussion forum	2K
25.	Notification of system disruptions	2L
26.	Ease of access to information	3A
27.	Portal online	3B
28.	Mobile app	3C
29.	Very helpful	3D
30.	Organize lectures	3E
31.	More helpful	3F
32.	Quality of systems and technological infrastructure used	3G
33.	Personalization features	3H
34.	Can set preferences as needed	3I
35.	Relevant and easy to use	3D
36.	As per individual requirements	3K
37.	Technical support	3L
38.	Training and socialization in use	3M
39.	Area	4A
40.	Accessibility	4B
41.	Information systems	4C
42.	Campus digital payments	4D
43.	Digital library	4E
44.	Reliability and speed of service	4F
45.	Beautified look	4G
46.	Attractive and intuitive interface	4H
47.	Customer support and service	4I
48.	Live chat help	4D
49.	Contact view, easy-to-reach email4	4K
50.	Great potential	5A
51.	Full features	5B
52.	All-in-one online portal	5C
53.	Mobile app	5D
54.	Easy to use	5E
55.	Improve the student experience	5F
56.	College time management	5G

57. Latest information from the university	5H
58. Feature suitability and relevance	5I
59. Student needs	5D
60. Pay attention to the social aspects of service	5K
61. Want to be informed of the latest news such as changes in lecture schedules, campus events, and / or information related to university policies	5L
62. Improve the experience	6A
63. Still need improvement	6B
64. Nice features	6C
65. Meet teaching and learning needs	6D
66. Crucial service accessibility	6E
67. Accurate and up-to-date information	6F
68. Quality and responsiveness	6G
69. Easy to check and pleasing to the eye	6H
70. Data security	6I
71. Collaboration	6D
72. Technical support	6K
73. Comfort	7A
74. Access academic information and resources	7B
75. Quality of service	7C
76. Function consistently, responsively, and uninterruptedly	7D
77. Integration of services with other systems on campus	7E
78. Provide solutions	7F
79. As needed	7G
80. Personalization features and options	7A
81. Support collaboration among students, faculty and staff	7I
82. Technical support and assistance for users	7D
83. Data security and privacy	7K
84. Quality of material and content	7L

Axial Coding

Axial Coding is the next step after the open coding process, which is to set several themes / categories that accommodate some code that has been created in *open coding*. In *axial coding*, data is recollected that has been fragmented through open coding. By reviewing and re-highlighting common themes. The following is the categorization of *axial coding* that researchers have collected:

Categorization: Features of *Smart Campus*
Table 2. Features (*Axial Coding*)

Interpretation	Collection of Similar Facts
<i>E-learning</i>	Platform e-learning (2A)
Digital Payments	Fast and easy online payments (2E), campus digital payments (4D), digital library (4E)
Online Library	Digital library system (2C)
Mobile Application	Mobile apps (3C), mobile apps (5D)
Internet Campus Area	Stable internet connection in campus environment (1N), area (4A)
Information System	Access academic and administrative information (1B), online portal (3B), information system (4C), complete online portal (5C)

Categorization: Service View
Table 3. Service Display (*Axial Coding*)

Interpretation	Collection of Similar Facts
<i>User friendly</i>	Many conveniences (1A), easy to use (<i>user friendly</i>) (1K), easy to find references (2D), ease of access from various devices (2F), ease of access to information (3A), relevant and easy to use (3)], ease of access (4B), easy to use (5E)

Responsifitas	Service system responsiveness (1L), service reliability and speed (4F), consistent functioning, responsiveness, and uninterrupted (7D)
Pull	Beautiful display (4G), attractive and intuitive display (4H), easy to check and pleasing to the eye (6H)
Completeness of services	Complete features (1E), access to online course materials (2B), complete and relevant features (2G), personalization features (3H), can set preferences as needed (3I), complete features (5B), suitability and relevance of features (5I), good features (6C), crucial service accessibility (6E), access to information and academic resources (7B), personalization features and options (7D)
Interactive	Interactive interface page (1J)

Categorization: Administrative Efficiency
Table 4. Administrative Efficiency

Interpretation	Collection of Similar Facts
The nature of administrative services	Cost-effective (1C), labor-saving (1D), access academic and administrative information (1B), accurate and up-to-date information (6F)
Course management	Easy to check schedules, announcements, exam results (1H), very helpful (3D), lecture management (3E), college time management (5G)
Up-to-date information	Availability of real-time information (1G), the

latest information from universities (5H)

Categorization: Environment
Table 5. Environment (Axial Coding)

Interpretation	Collection of Similar Facts
New and supportive experiences	Area (4A), enhance student experience (5F), enhance experience (6A), collaboration (6J), support collaboration among students, faculty and staff (7I)
Quality of service	Quality of systems and technological infrastructure used (3G), quality and responsiveness (6G) quality of service (7C), quality of materials and content (7L)
Technology infrastructure	Great potential (5A), still needs improvement (6B), integration of services with other systems on campus (7E)
Comfort	Data security (2H, 6I), convenience (7A), data security and privacy (7K)

Categorization: *Caring of Student's Needs*
Tabel 6. *Caring of Student's Needs* (Axial Coding)

Interpretation	Collection of Similar Facts
Social aspects of service	Notifications from universities (1F), interaction and communication with lecturers (2J), training and socialization in use (3M), customer support and service (4I), <i>live chat</i> assistance (4J), paying attention to social aspects of service (5C), wanting to be informed of the latest news such as changes in lecture schedules, campus events, and / or

Help center	information related to university policies (5L) Get help as soon as possible if there is a technical problem (1M), notification if there is a system problem (2L), very helpful (3D), more helpful (3F), technical support (3L, 6K)), contact view, email easy to reach (4K)
Solutive	Good technical support (2I), individual requirements (3K), solution providing (7F), technical support and user assistance (7J)
Needs orientation	Student needs (5J), meeting teaching and learning needs (6D), as needed (7G)

Selective Coding

Selective coding is the next step after the *open coding* and *axial coding* process is carried out. In *selective coding*, a researcher can find the essence of research and combine all elements of an emerging theory. Included in the core category were the ideas that were most significant to participants. The following *selective coding* obtained by researchers from this study by referring to the purpose of this study is to identify the features of *smart campus* services that are most often used by students so that they can be adopted in each university and the factors that influence students to use these services:

Table 7. Core Categories (*Selective Coding*)

Core Categories
Feature
Service Display
Administration efficiency
Environment
<i>Caring of Student's Needs</i>

Discussion

The data analysis stage is a stage to process data and interpret data that has been collected from direct interviews with participants in the field, after the cross-case

analysis stage with open coding, axial coding and selective coding methods carried out by researchers in this study, the research findings that have been obtained are described.

This study identifies factors that influence students in using smart campus features that have been implemented in universities in the city of Makassar, namely:

Feature

The implementation of smart campus can help improve the quality of education, campus comfort, and overall operational efficiency. Here are some smart campus services that can be applied to universities:

1. Campus Mobile App:
Development of campus mobile applications that provide quick access to important information, such as lecture schedules, exam results, notifications, location of campus facilities, and other academic services.
2. Smart Classroom dan E-learning:
Utilization of technology in the learning process, such as interactive whiteboards, e-learning platforms, lecture recordings, and virtual classes to support a more interactive and innovative learning experience.
3. Smart Library:
Use of intelligent library management systems, self-checking systems, and access to digital resources to facilitate the search and access to information for students and staff.
4. Smart Payment, also known as smart payment or smart payment, refers to a payment system that uses digital technology to replace more conventional traditional payment methods, such as cash or physical credit cards. In this case it can be applied for example payment using internet banking, e-wallet, or NFC (near field communication) which allows payment for example payment of tuition fees just by holding the phone close to a compatible payment terminal.
5. Wi-Fi networks are provided within a college or university campus to provide internet access to students, staff, and campus visitors. Campus WiFi service is

an important facility that allows easy and fast access to the internet throughout the campus area.

Service Display

A service display is a way or interface used to present information, features, and functions of a service to users. In the context of a smart campus or campus information system, the appearance of services is very important because it can affect user experience and the effectiveness of using services. Some important points regarding the appearance of services obtained based on this research are:

1. **User Interface**
The service interface includes a user interface that includes graphic design, layout, colors, and other visual elements. An attractive, user-friendly, and easy-to-understand user interface will make users feel comfortable and easy to use the service.
2. **Intuitive Navigation**
The service display should provide easy and intuitive navigation, so that users can quickly find the information they are looking for or access the desired features without difficulty.
3. **Responsive and Mobile-Friendly**
The service display should be responsive and well accessible from a variety of devices, including smartphones and tablets. Thus, users can use the service from anywhere and anytime with maximum convenience.
4. **Information Organization**
The display of the service must organize the information well, so that relevant and important information is easily found by users. An organized information structure will help users get a better experience in using the service.
5. **Design Consistency**
Consistency in interface design for various features and pages within the service will help users recognize patterns and functions of various elements, making it easier to adapt to new features introduced in the service.
6. **Media Use and Visualization**

Service views can increase traction by using relevant media, images, or data visualizations. Smart and effective use of visual elements can make it easier for users to understand information.

7. A good display of services will help increase the adoption and utilization of Smart Campus by campus members, increase efficiency in accessing information and services, and improve the overall user experience.

Administrative Efficiency

Administrative efficiency in a smart campus refers to efforts to optimize the management and implementation of administrative tasks in a college or university environment. The goal of achieving administrative efficiency on campus is to improve the quality of educational services, optimize the use of resources, and improve the experience of students, faculty, and employees.

Smart Campus automates campus administration processes, such as enrollment, student record management, and assessment processes. The application of this technology reduces administrative burden, improves data accuracy, and allows staff and lecturers to focus more on academic services and student development. Better administrative efficiency can reduce operational costs, improve operational effectiveness, and provide a better experience for all campus members. Good administrative efficiency can also help campuses focus on their core mission, which is to provide high-quality education to students and provide an optimal learning environment.

Environmental

A digital or online environment that includes a variety of digital platforms and services can be used by colleges or universities to provide access to a variety of academic resources and services online. This virtual campus environment aims to provide learning, communication, and administrative support for students, faculty, and staff without having to be in a physical campus location. This environment will enhance the student experience, supporting collaboration among students, faculty and

staff. Because of the quality of the systems and technological infrastructure used, the quality of material and content has great potential to provide a new atmosphere in the academic world. The integration of services with other academic systems in the campus environment also gives the impression that the campus environment has good synergy and air. In addition, data security and student privacy are maintained while in a virtual campus environment.

The virtual environment of campus allows for distance learning, flexibility, and accessibility for all campus members, especially in situations where physical attendance on campus is restricted, such as during the Covid-19 pandemic or other emergencies. With the adoption of this technology, colleges can expand the scope and improve the overall learning experience.

Caring of Student's Needs

Student needs are key to any college service. Therefore, in building or developing a feature on smart campus services, it must pay attention to or be oriented to student needs.

Caring of student's needs in a smart campus refers to how advanced information and communication technology is used to provide better support and responsiveness to various student needs in a smart campus environment. Technology in smart campuses can be used to enhance students' learning experience, well-being, and academic success. Here are some examples of how caring of student's needs is applied in a smart campus:

1. **Personalized Learning**
By using data and analytics, smart campuses can provide learning that is more personalized and tailored to the needs of each student. Smart learning platforms can recommend learning materials or resources that match a student's individual learning style and interests.
2. **Online Access to Lecture Materials and Resources**
Smart campus provides online access to lecture materials, books, scientific journals, and other learning resources. Students can easily access this

information through their devices anywhere and anytime.

3. **Mental Counselling and Support Platform**
Smart campuses can provide an online counselling platform that allows students to talk to a counsellor or psychologist to cope with any emotional or mental issues they are facing.
4. **Accessibility and Accommodation:**
Smart campuses provide better accessibility for students with special needs. Disability-friendly platforms and facilities can help students with limited mobility or other access needs.
5. **Academic and Administrative Services:**
Smart campus provides online academic and administrative services, including registration, payment, academic advising, and other services that are easily accessible to students.
6. **Careers and Job Placement Services**
Smart campuses can provide careers and job placement platforms that help students find jobs or internships that match their interests and skills.
7. **Mental Health Awareness**
Smart campuses can run awareness campaigns about mental health and stress for students and provide information on how to manage stress and mental health.
8. **Student Participation Forums**
Smart campuses can provide student participation forums that allow students to contribute to decision-making and provide input to improve the learning experience and overall campus life.

By utilizing smart and innovative technology, smart campuses can provide better support and be responsive to various student needs, thus creating a learning environment that is more inclusive, efficient, and supports students' academic and personal success.

CONCLUSION

Based on the results of data analysis and discussion on identifying factors that affect student satisfaction in accessing smart campus service features, five factors were found, namely:

1. Factors of smart campus service types, some of the most popular are e-learning, digital payments, campus mobile applications, smart libraries, and campus internet.
2. The service display factors include user-friendly, service responsiveness, attractive interface, completeness of service, and interactivity.
3. Administrative efficiency factors, with indicators of cost-effective, energy, time, lecture management, and up to date information.
4. Environmental factors, indicators of providing new and supportive experiences, built technology infrastructure, quality of service, and convenience include data security and student privacy.
5. The caring factor of students needs describes the ability of the service to care for student needs, including attention to social aspects of services, service centers, solutions and understanding student needs.

SUGGESTION

Some suggestions from researchers are:

1. For universities, although the research was conducted in the city of Makassar, smart campus services are not new. Therefore, smart campus services that have been obtained in this study should be improved and developed according to student needs,
2. For future research, you should analyze the factors that have been produced in this study through factor analysis to determine the dominant factor to the weakest effect on student satisfaction.

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