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Development of Ward visitor Management System in the COVID-19 Epidemic

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Objective and Significance

- To design, develop, and deploy a visitor management system to effectively management of visitors during COVID-19.
- Improves infection control, increases efficiency, facilitates dynamic monitoring, supports policy decisions, improves patient and visitor satisfaction.

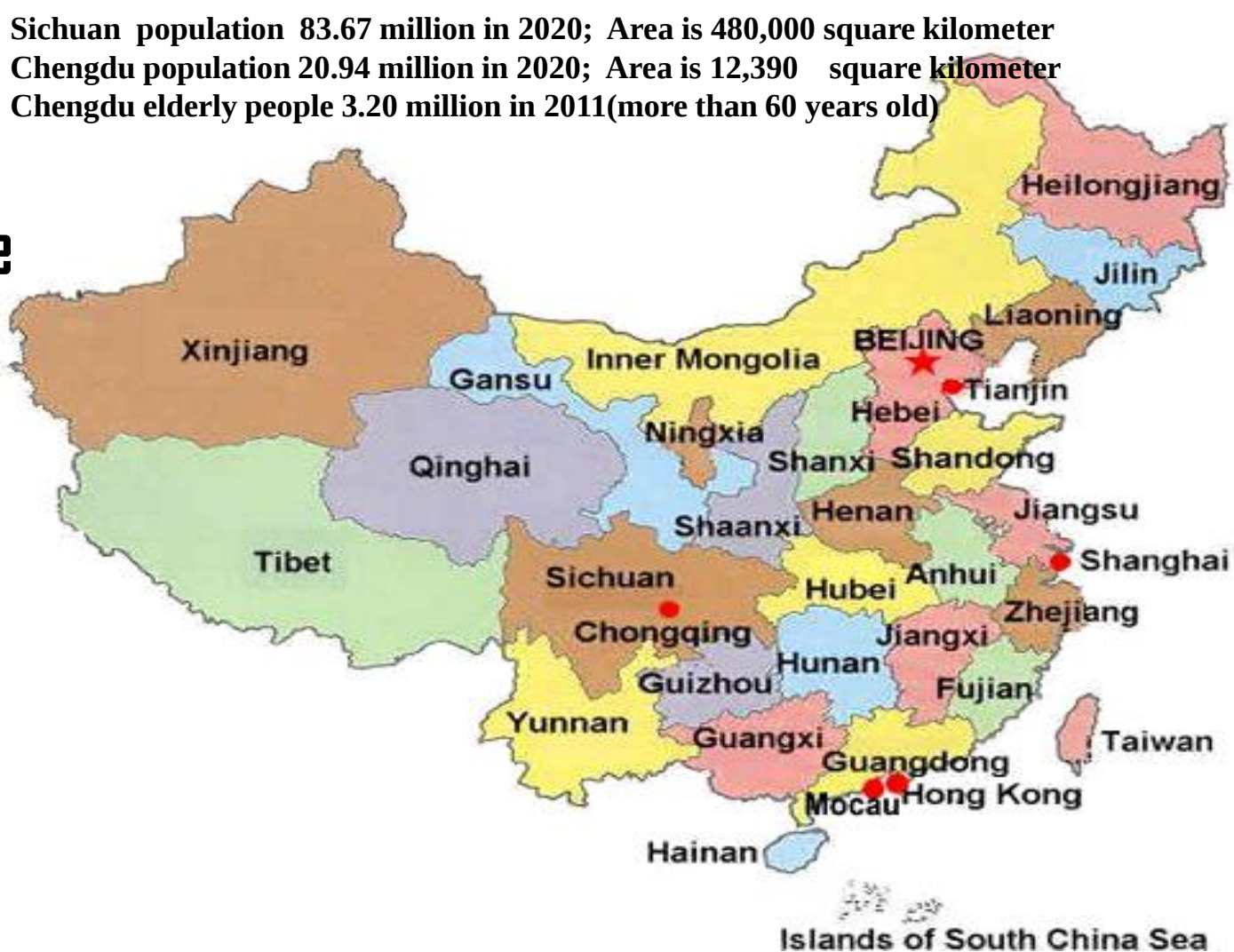


Introduction

- Overview of COVID-19 and its global impact.
- The challenge of managing hospital visitors during the pandemic.
- Limitations of traditional visitor registration methods.
- The urgent need for a new visitor management system.
- Implementation of visitor management system on November 10, 2020.

Sichuan population 83.67 million in 2020; Area is 480,000 square kilometer
 Chengdu population 20.94 million in 2020; Area is 12,390 square kilometer
 Chengdu elderly people 3.20 million in 2011(more than 60 years old)

Study Site





8





8

Country of Heaven





Peace



Friendship





Study Site

Chengdu China (Southwest in China)



The hospital covers an area of 46.7 hectares, owns 400,000 square meters of building for clinical use



It was established by the Canada, United States, and Great Britain in 1892



Study Site

- West China Hospital: one of China's largest comprehensive public medical centers. No.2, The Best Hospital in China Rankings (2009-2021), by Fudan University. No.1 Science and Technology Evaluation Metrics (STEM) Rankings for Chinese Hospitals (2013-2021)
- Beds: 4,300 ; Employees: >14,000
- Surgeries: 207, 500 (2022)
- Discharged: 302, 300 inpatients (2022)
- Outpatient & ER visits: 8.79 million (2022)



Design Process

- Use of UCD (User-Centered Design) methods.
- Consideration of opinions and requirements of end users.
- Iterative approach with interviews, usability tests, and a cognitive walk-through method.



Technology Application

- Use of HTML5, ESB (enterprise service bus), 4G-5G network, and cloud computing in the system architecture.
- The importance of data security and measures taken.



Security

- Data security ensured through digital signing and encryption.
- Interacting data with Sichuan Tianfu Health Code platform digitally signed using HMACSHA256 (keyed hash algorithm).
- Encryption used to protect data integrity, non-repudiation, and confidentiality.

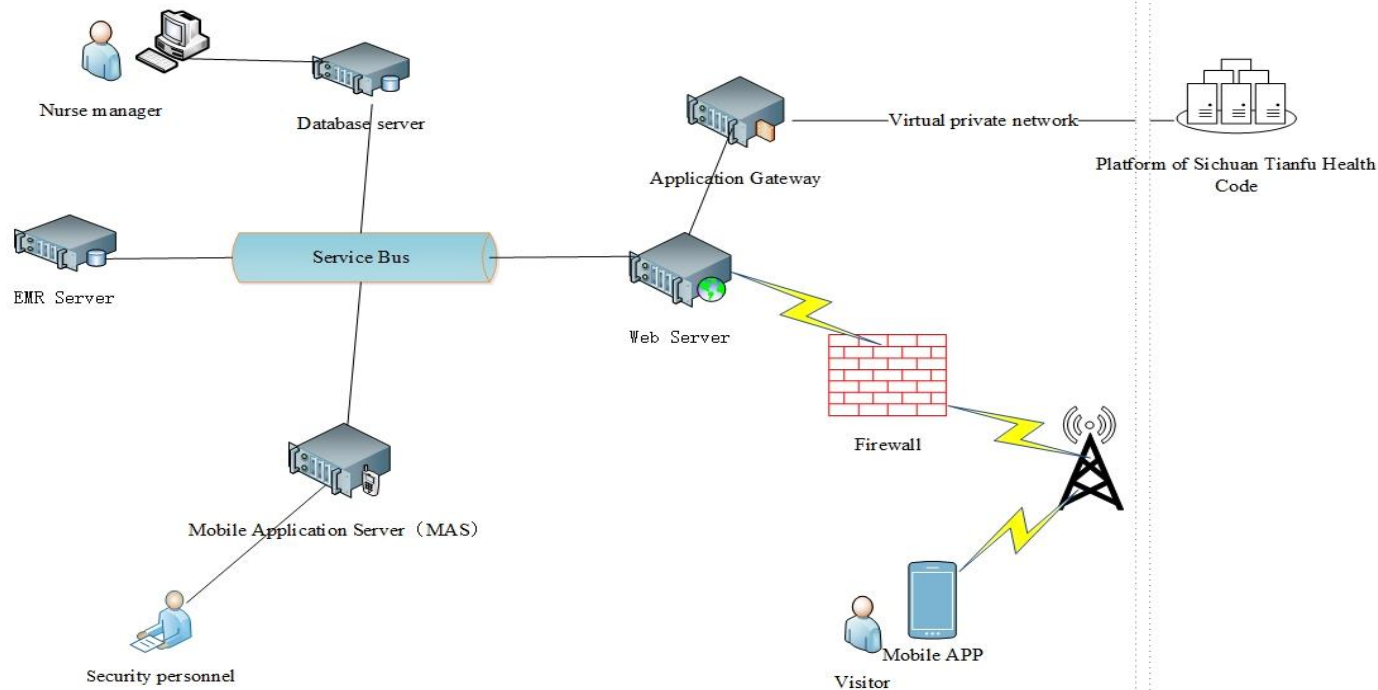


Ethics

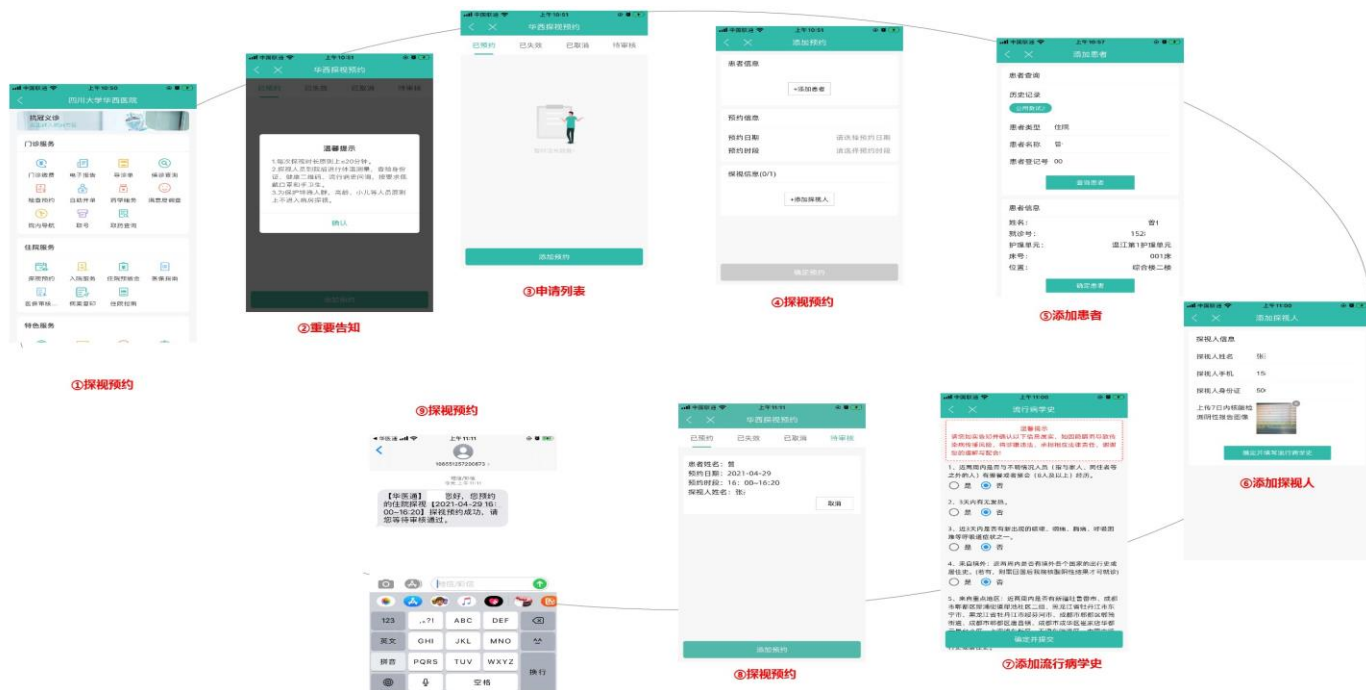
- This research was observational, based on user responses to interface design, and did not involve medical intervention. The research did not require ethical approval under the regulations of the author's country.



System Architecture



Application Process



Application Process

探视预约审核

开始日期: 2021-04-28 结束日期: 2021-04-30 床号: 登记号: 护理单元: 审核状态: 未审核 查询

申请ID	床号	姓名	登记号	预约日期	申请时间	审核状态	探视人姓名	探视人联系方式	审核通过	作废申请	查看审核报告
3189	001床			2021-04-29	2021-04-29 11:25:59	待审核			同意	拒绝	查看

APP已审核

患者姓名: 预约日期: 2021-04-29 预约时段: 16:00-16:20 探视人姓名: 分享 取消

短信通知

【华医通】您好, 您预约的住院探视【2021-04-29 16:00-16:20】探视预约成功, 请您等待审核通过。

【华医通】您好, 您预约的住院探视【2021-04-29 16:00-16:20】已取消预约。

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【华医通】您好, 您预约的住院探视【2021-04-29 16:00-16:20】已预约成功, 请准时前往【综合楼二楼】进行探视。



Functionality of the System

- Alert function for visitors, patients, managers, and security personnel.
- Monitoring and tracking of visitor health through Sichuan Tianfu Health Code platform.
- Statistical analysis of visitor data.



Preliminary Application

- Data from November 10-18, 2020: 292 visits, 90 approved visits, 90 safe visits conducted.
- 584 dynamic monitoring and early alerts provided.
- Establishment of a safe visitation management system.



Discussion

- System connected to Health Code system for sharing health information.
- Use of color-based Health Code to monitor personal health.
- Reduction of spread through visitor management and contact recording.
- Privacy protection strategies implemented.



Conclusion

- Visit management system optimizes ward visitor process.
- Improves staff productivity and reduces infection transmission risk.
- Dynamic monitoring and effective visitor management.
- Potential for global implementation.



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Thank you!

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