

Developing Medical Resource Scheduling Application System Agilely With The Concept Of DevOps To Practice Lean Management Under The Epidemic Situation

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◆Introduction

The combination of Development and Operations is called "DevOps", which shortens the distance between the development and maintenance teams in the enterprise to cope with the rapidly changing environment through automated integration, continuous release and correction of software. Since the outbreak of the Covid-19 epidemic, with the spread of the epidemic, policies and coping practices have changed rapidly. Since May 2022, the government in the Kaohsiung area (southern Taiwan) has successively expropriated hospital wards and converted them into dedicated wards. The medical manpower, beds, and capacity of medical care for acute and severe patients must be maintained. Management measures for hospital admission and treatment of Covid-19 infected patients and bed scheduling have become urgent and important issues. This case is a case of a regional hospital in Kaohsiung city, which developing a real-time dynamic dashboard for inpatients with Covid-19 solved the dilemma of data acquisition and collection difficulties, so that decision-making can have real-time and correct information, and improve bed rotation efficiently in order to treat more patients with moderate and severe Covid-19 patients.

◆Methods

Based on the principle of extreme program design and minimum usable product, information personnel use the Rails7.0 project to develop instruments to provide "Inpatients with positive covid-19 nucleic acid test in the whole hospital", "Inpatients with covid-19 infection in general wards", "Inpatients who have lived in the ward for the number of days that should be quarantined in dedicated ward (according to the government announcement in May 2022, the quarantine will be released after 7 days after the diagnosis)" and other related information, the instrument data is extracted from the HIS database and updated every 10 minutes.

The effectiveness of patient care management is measured by the number of hospitalizations and days of confirmed patients. The source of the data is the de-identified hospitalization declaration data from January 2022 to July 2022. The main diagnosis is U071 (confirmed COVID-19 virus infection) case analysis hospitalization of covid-19 infected patients.

◆Results

From January 2022 to July 2022, 518 people were hospitalized due to confirmed Covid-19 virus infection, with an average age of 65.6 years (standard deviation: 19.6). The epidemic in Kaohsiung city began to heat up in May 2022, and the real-time information dashboard was also developed and introduced at this stage. From May to July 2022, a total of 470 people were diagnosed with Covid-19 virus infection and hospitalized, about 86.38% of which could be transferred out of dedicated ward within 8 days. The average length of stay was 7.7 days (standard deviation: 2.97).

◆Conclusion

The results show that in the case of a large number of patients admitted at the peak of the epidemic, effective treatment can still be achieved, and the use of beds in dedicated wards can be managed and controlled in accordance with policies, allowing limited medical resources to maximize efficiency. Under the wave of medical digital transformation, information technology can quickly respond to the challenges of the external environment and provide real-time and accurate information with the concept of DevOps, which saves the effort of clinical staff to collect data and confirm each item. It allows medical staff to focus on caring for patients and maintaining medical quality and capacity.

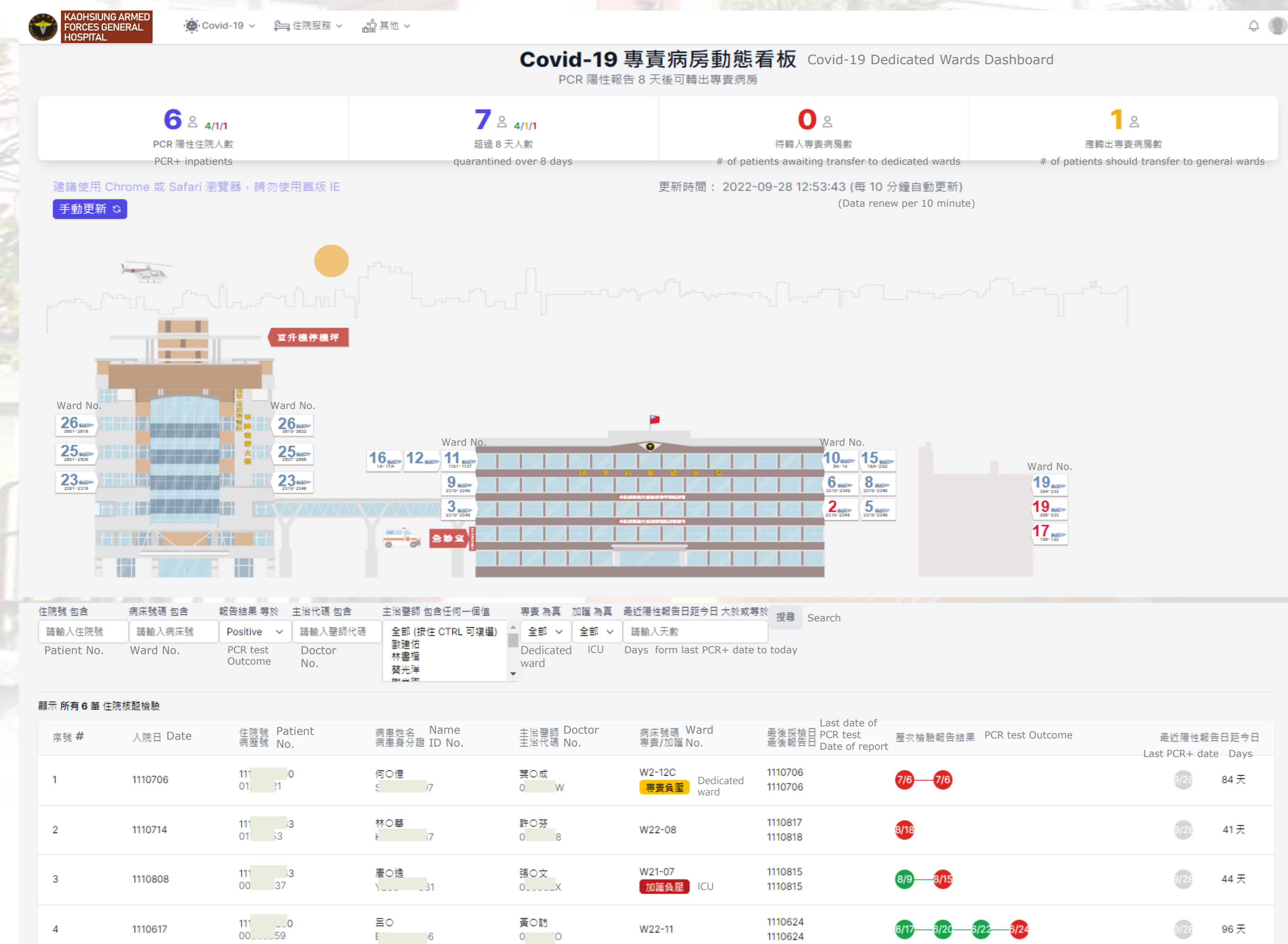
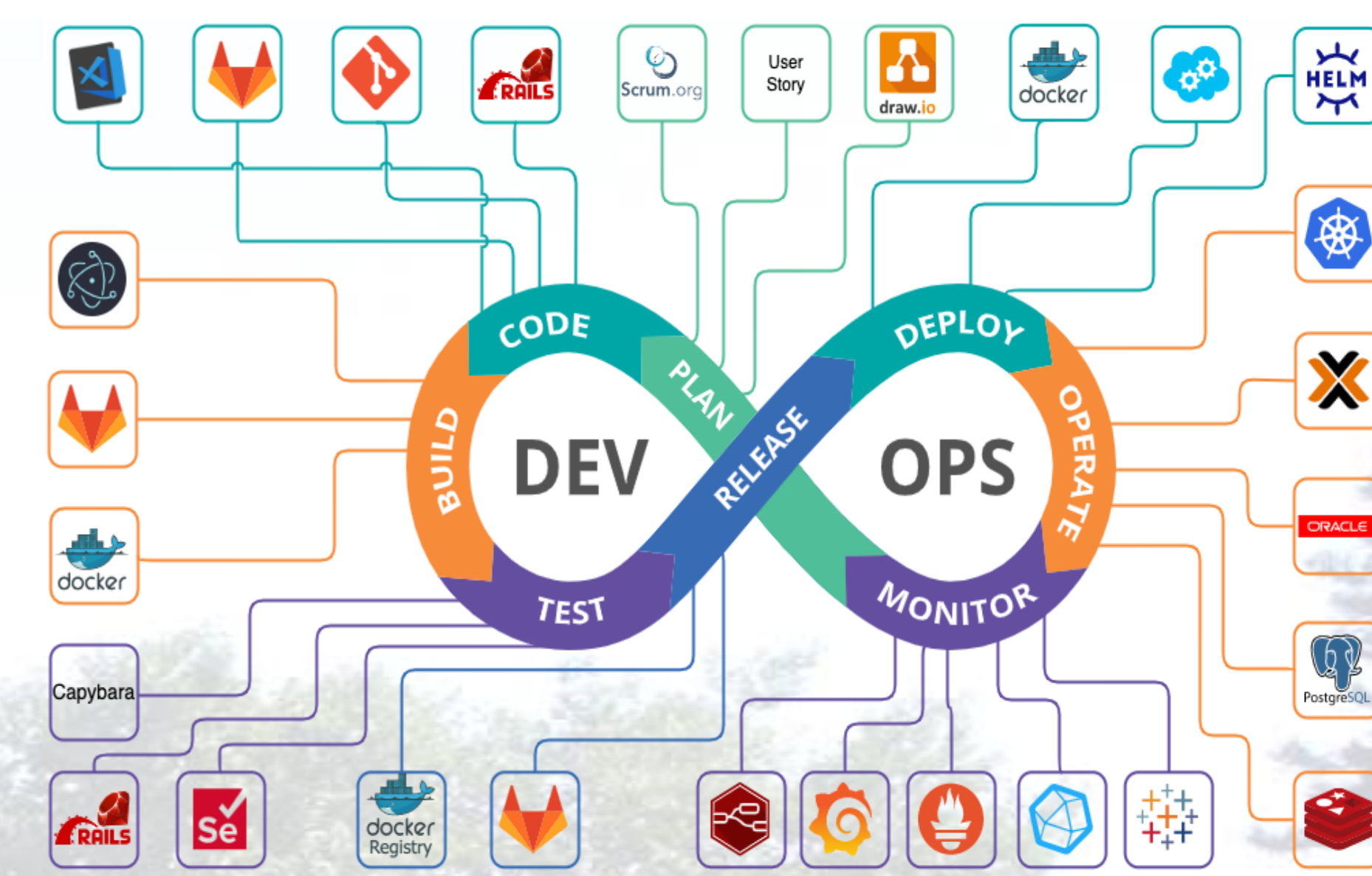


Table. Covid-19 inpatients and Length of stay in dedicated wards

Date	2022 JAN	2022 FEB	2022 MAR	2022 APR	2022 MAY	2022 JUN	2022 JUL	Total
Covid-19 inpatients	10	9	16	13	74	286	110	518
Age	Mean	34.9	37.6	30.9	41.2	72.0	67.1	65.7
	S.D	12.0	13.2	7.9	19.2	17.5	17.4	19.6
Length of stay in dedicated wards (day)	Mean	6.2	11.7	5.1	8.5	7.8	7.4	7.5
	S.D	3.9	6.9	3.7	3.9	2.4	2.8	3.0
	Max	11	27	12	13	17	22	22
Min	2	3	3	3	1	1	1	1