

Overview:

The client is a renowned provider of home-based dialysis services. Their intent is to improve the lives of people suffering from chronic kidney disease. With the help of nurses who are trained and specialists in this field of work, the client runs an establishment that offers its services to patients keen to dialyze in the comforts of their homes. Besides that, they are also the preferred provider of experienced nurses to many reputed renal units across Australia.

At the time Mindfire was approached for work, the client was already using an application to keep a track of all the care-related activities performed by their nurses across various locations. However, besides the results falling short of their expectations, there were a few additional features they wanted implemented. It allowed the team@Mindfire to understand their workflows in detail and offer a solution that was comprehensive and served their needs best.

Client details:

Name: Confidential | Type: Healthcare | Location: Australia

Technologies:

PHP, Codelgniter, MySQL, Apache, jQuery, Service workers, IndexedDB, Background Sync, Google Maps API

Project Description:

The Client wanted a web application to manage nurse-patient appointments (shifts), nurse timesheets, nurse leaves, store securely all the data collected during the dialysis of a patient, generate reports on the data collected, and manage any incidents that occur during treatment etc. With the existing online version not delivering the desired results, the client approached Mindfire Solutions to build a solution which would enable it to achieve its goals - maximize the opportunity the online medium offered. After thoroughly analyzing the need, the team at Mindfire offered to develop a customized solution in Codeigniter.

The development of the solution involved a thorough understanding of the requirements of the client. The intent was to build a comprehensive solution with features to address their existing needs and infuse the ability to use it in offline mode. This was critical because the users (nurses) of the application are required to carry an android tablet to a patient's home where there was no guarantee of reliable internet connectivity.



To build the capability, we used the PWA approach for developing the web solution. So a nurse can add the treatment related data and the same gets stored securely in the web browser's indexedDB. Later, when the internet connectivity is established, the data gets synced back to the backend server. Find below the elaboration of some of the salient features built into the system.

• There are two main users of the application: admin users and nurses.

Nurses can assess details of their shifts and those of the patients assigned to them. They can start/stop their shift as they happen.

When they start their shift they can add the patient's various readings like the weight of the patient when they started dialysis etc. There are many such fields related to dialysis which they have to record in the website when they start / stop shifts - and these values of these fields are noted 3 times

- 1) before they begin dialysis
- 2) in the middle of the dialysis
- 3) after the dialysis is done

Due to the uncertainty revolving around the internet connectivity available in a patient's home, all this data is encrypted and added first to the browser's IndexedDB and when the connectivity is good, it is synced up with the backend servers.

Admin users can do all the things that a nurse can do and much more. They can manage the entire scheduling, reporting, creation of nurse/patient accounts etc. They can create other user-accounts and assign roles to those. They can add patient-accounts and run various reports. Admin users can schedule shifts for patient-visits and assign them to nurses. They can add/modify patient profiles, and update medication details.

- There is a section to create and assign policies and documents that nurses need to accept before they start their treatment of any patient.
- There is a timesheet section which records the time spent by individual nurses with each patient. A user can see weekly timesheets and easily find out the total number of hours added. There is provision to run weekly/monthly/yearly/custom period reports for all timesheets and shifts.
- There is a section for incident management where incidents/tickets can be raised and assigned to specific users. And the users are expected to resolve those incidents/requirements.



- There is a section to manage project wide settings which include user-role management, custom field management like creating custom fields and assignment to patient profiles. Nurses can use these fields to enter their readings when they do their shifts.
- It is possible to add location-details to a patient's profile with the feature integrated to google maps. For any patient, this information shows up along with the shift details of nurses. It acts as an address marker for the patient's home and helps nurses navigate to their destination without facing difficulties. Going forward, the intent is to also include a feature to allow the nurses to identify the shortest / best path route to their destinations. The system also captures location details where a nurse has started/stopped a shift. Further, admins can set restrictions for a nurse to start/stop a shift if the nurse is not within a specified distance from the patient's home. We also track the nurse's location while the treatment is going on in order to ensure that the nurse doesn't move too far away from the patient.



Architecture:



Screenshots

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C	Active	0	ABESAMIS	Kayle	kayle_abesamis@yahoo.com Juined 22.05.2020		SUTHERLAND	NSW	STANDARD Change	Action -
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С	Active	₿	AMPO	Jeremiah Stephen	test@testpoint.com Joined 17.12.2019		Blacktown	NSW	STANDARD Change	Action +
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Screenshot 1: User List

Patient -			
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Medical Record Number: 383408		Nephrologist Details Next Nephrologist appointment	t Next of Kin Reports sent to Nephrologist Serology
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Screenshot 2: Patient Profile



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Screenshot 3: Scheduler

Tasks	M 04 May	T 05 May	W 06 May	T 07 May	F 08 May	S 09 May	S 10 May	Total	
[00+1801] Mr. REID Alexander - Advance Care Directive (ACD) ROSTER (Monday) 97:30 AM - 01:30 PM	5.87							5.87	•
[1703912] Mr. BLACKMAN Glen ROSTER (Monday) 02:00 PM - 08:00 PM	5.53							5.53	•
[0041801] Mr. REID Alexander - Advance Care Directive (ACD) ROSTER (Midnesday) 07:30 AM - 01:30 PM			5.84					5.84	٩
[1703912] Mr. BLACKMAN Gien ROSTER (Medweday) 02:00 PM - 08:00 PM			5.56					5.56	•
[1703912] Mr. BLACKMAN Gien ROSTER (Fixley) 06:00 AM - 12:00 PM					5.50			5.50	•
[0041801] Mr. REID Alexander - Advance Care Directive (ACD) ROSTER (Friday) 02:00 PM - 08:00 PM					5.88			5.08	٩
	11.40	0.00	11.40	0.03	11.38	0.00	0.00	34.18	

Screenshot 4: Timesheet



TimeFrame This Year - (01/01/2020 - 17/07/2020) Total 12/29 Hours 12/29 Hours 22/29 Thete-Hours (322,000 Difable All Status Al				Clients Projects Tasks Persons	Ali Ali Ali Ali			
Client 👻		Project	Task		Person	Hours	Billable Rate	Billable Am
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Department of Veterans	Affairs (DVA)	[1035837] Mr. GRIFFITHS Anthony	ROSTER		Tuckta Mahasay	6.10	\$0.000	\$0.00
Department of Veterans	Affairs (DVA)	[1035837] M: GRIFFITHS Anthony	ROSTER		Tuckta Mahasay	6.13	\$0.000	\$0.00
Department of Veterana	Affairs (DVA)	[1035837] Mr. GRIFFITHS Anthony	ROSTER		Tuckta Mahasay	6.27	50.000	\$0.00
 Michael Bartlett En 	tries: 39 Total	Hours: 218.94 Total Billable Amount:	\$0.00 Total Cost Amoun	d: \$0.00				
Medibank		[382282] Mr. BLEE Raymond	ROSTER		Michael Bartlett	5.90	\$0.000	\$0.00
Medibank		[362282] Mr. BLEE Raymond	ROSTER		Michael Bartlett	5.72	\$0.000	\$0.00
Medibank		[4095190] Mr. WU Shudong	ROSTER		Michael Bartlett	4.70	\$0.000	\$0.00
Medibank		[4095190] Mr. WU Shudong	ROSTER		Michael Bartlett	5.32	\$0.000	\$0.00
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Screenshot 5: Reports

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Screenshot 6: Settings



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Screenshot 7: Patient location



Screenshot 8: Nurse location tracking





Screenshot 9: Path to Patient's home