

# 35

American Heroes Died

*AND... 1700 out of 3100 patients  
requiring a GP appointment  
were not on the waiting list*

## WHAT HAPPENED?

*A Trusted Organization Failed to be  
Trusted... And this is just 1 hospital*

- *Retroactively modified appointment dates to fit required 14 day government appointment regulation*
- *Deleted patient names from existing waiting list*
- *Failed to add names to waiting list*

# THIS MONTH A BILL IN CONGRESS SUGGESTED THE USE OF BLOCKCHAIN TO PREVENT SUCH AN EVENT IN THE FUTURE

*Blockchain Solution Aims to create an auditable immutable appointment creation and tracking system*

- Registers request for appointment from the first phone call or referral request
- Identifies best available appointments to meet 14 day requirement
- No appointments .... Waiting list created and reminders generated to ensure patient gets appointment as close to the 14 day req as possible
- Regular audits generated to confirm no inhouse data tampering.

-- HOUSE RESOLUTION 859; REPRESENTATIVE DAVID SCHWEIKERT OF ARIZONA



Secured Appointment  
Auditing System

**SAAVHA**

In The  
Veterans Health Administration



PATIENT WAITLIST



*NO PII ADDED*



MYSQL

PATIENT APPOINTMENT

API

localhost

VA Aud

Blockcl

B Getting

Presen

Justin

localhost/dhva-appointment-blocks/#/create-appointment?\_k=41tf5c

Create New Appointment

Patient: Joanna

Department

Cardiology

Doctor

Any

Pick Day

October 2016

Su	Mo	Tu	We	Th	Fr	Sa
25	26	27	28	29	30	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1	2	3	4	5

Pick Time

13:45

Create

Availability

«

October 2016

»

25	26	27	28	29	30	1 Available: 2
2 Available: 2	3 Available: 7	4 Available: 1	5 Available: 10	6 Available: 10	7 Available: 1	8 Available: 6
9 Available: 9	10 Available: 8	11 Available: 5	12 Available: 8	13 Available: 7	14 Available: 6	15 Available: 1
16 Available: 7	17 Available: 6	18 Available: 3	19 Available: 3	20 Available: 8	21 Available: 8	22 Available: 4
23 Available: 8	24 Available: 3	25 Available: 2	26 Available: 5	27 Available: 2	28 Available: 10	29 Available: 9

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30	31	1	2	3	4	5

Pick Time

No Avail Times that work

Add to Waitlist

Availability

«

October 2016

»

25	26	27	28	29	30	1 Available: 2
2 Available: 7	3 Available: 6	4 Available: 5	5 Available: 8	6 Available: 6	7 Available: 9	8 Available: 5
9 Available: 5	10 Available: 11	11 Available: 8	12 Available: 10	13 Available: 9	14 Available: 11	15 Available: 8
16 Available: 5	17 Available: 11	18 Available: 3	19 Available: 8	20 Available: 6	21 Available: 1	22 Available: 11
23 Available: 7	24 Available: 3	25 Available: 10	26 Available: 10	27 Available: 7	28 Available: 8	29 Available: 1

API

localhost /

localhost/c

Blockchain

Bootstrap

localhost/phpmyadmin/tbl\_change.php?db=va&table=appointment8

Justin

phpMyAdmin

Recent

Favorites

New

dfserv

information\_schema

mysql

performance\_schema

pestcomco

pestjobs

sys

va

New

appointment

appointment\_local

appointment\_tracking

appointment\_type

department

event\_type

patient

reminder\_method

request\_type

staff

staff\_type

test

Server: Local Databases » Database: va » Table: appointment

Browse

Structure

SQL

Search

More

Column	Type	Function
ID	int(10) unsigned	
DATE_FROM	datetime	
DATE_TO	datetime	
C_TS	timestamp	
L_TS	timestamp	
HASH	varchar(256)	
APPOINTMENT_TYPE_ID	int(11)	
STAFF_ID	int(10) unsigned	
PATIENT_LOCAL_ID	int(10) unsigned	
PHYSICIAN_LOCAL_ID	int(10) unsigned	
REQUEST_TYPE_ID	int(10) unsigned	
REMINDER_METHOD_ID	int(10) unsigned	
WAIT_LIST	tinyint(3) unsigned	
COMPLETED	tinyint(4)	

Console



API x localho x VA Aud x Blockcl x B Getting x M Presen x Justin

localhost/dhva-appointment-blocks/audit.php

Audit Results

Appointment for: USER471 on 2016-10-02 12:15:00

Value	Local DB	Blockchain
Timestamp	2016-10-02 12:15:00	2016-10-02 12:15:00
Attending ID	10	10
Row Hash	2204d758f10faad47fed2307ac849ed0203b2a0b7a2b4128b27539483ce31f9b	2204d758f10faad47fed2307ac849ed0203b2a0b7a2b4128b27539483ce31f9b
Hash Matches Data?	YES	

Appointment for: USER159 on 2016-10-12 12:30:00

Value	Local DB	Blockchain
Timestamp	2016-10-12 12:30:00	2016-10-12 12:30:00
Attending ID	9	10
Row Hash	748c21300af18bb7d25deb041cc6452a419833271b7c17d95b99b0eb3311cbac	748c21300af18bb7d25deb041cc6452a419833271b7c17d95b99b0eb3311cbac
Hash Matches Data?	NO, data changed	

Appointment for: USER477 on 2016-10-05 12:30:00

Value	Local DB	Blockchain
Timestamp	2016-10-05 12:30:00	2016-10-05 12:30:00
Attending ID	10	10
Row Hash	03aa33c783e74d24d1f4b9c09c3a946e6551a63f65ec9321cc9ab5983b70f802	03aa33c783e74d24d1f4b9c09c3a946e6551a63f65ec9321cc9ab5983b70f802
Hash Matches Data?	YES	

Appointment for: USER143 on 2016-10-02 13:15:00

Value	Local DB	Blockchain
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**THANK YOU**

**NASHVILLE**