



Smart Store: Idea, Design and Implementation

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Introduction – In History View

- Computer: (digital) device for computing or computing machine. Began in 30s, and used in 50s.
- Microcomputer: (IBM) PC and (Apple) Machintosh in 1980s
- Internet: as APRNET, began in 1960s
- E-commerce (Electronic commerce): Internet + business. Bagan around 80s, and became popular in 90s
- Telephone: (electric) device to talk over a distance. Began in 1900s

Introduction – Modern Terms

- Cellular phone: also called mobile phone. Began in 90s
- Smart phone (智能手机): mobile phone + CPU, programmable cell phone. A type of microcomputer with the capacity of media communications
 - Used as video phone
 - Combining other utility features, such as clock (I-Watch), medical devices (i.e. E-blood-pressure meter), security controller/monitor, etc.
- Smart TV (智能电视): TV + CPU
- Future trends: embed CPU to everywhere – smart bed, smart cooker, etc.

Introduction – View I

- Computer technology: information technology (IT) and engineering. Including computer hardware and software
 - IBM (hardware) → Microsoft (software: OS) → Google (software: search engine) → Apple (hardware + software + utilities: I-Pod, I-Phone, I-Watch, etc.)
- All above are utility providers (UP): hardware + software
- What can we do for the society by using UP?

Introduction – View II

We can do --

- Customer-centered services → profitable businesses + others
- E-commerce company (ECC): CPU + commerce
- Biggest ECCs: Ebay, Amazon, Alibaba, etc.
- POS: Point-of-sale (device/terminal/platform)
- Smart store/shopping-center: online-store, (traditional) store + IT, ???

??? → smart (phone) + store

Introduction – FACTS !

The world's biggest ECC --

- Ebay: as AuctionWeb, began in 1995, Revenue in 2014: \$18 billion; **net income: \$46 million**; total asset: \$45 billion
- Amazon: the largest Internet-based retailer in USA, began in 1995. Revenue in 2014: \$89 billion; **net income: -\$241 million**; total asset: \$54 billion
- Alibaba: the largest Internet-based retailer in China, began in 1999. Revenue in 2014: \$13 billion; **net income: \$4 billion**; total asset: \$42 billion

Smart Store – Ideas I

This is a FACT:

- in China, most young people use smart phones to shop goods from 淘宝网
- in USA, people shopping online mostly use computers, not a smart phone

Smart Store – Ideas II

Reasons:

- ❑ in China, payment (支付宝) binds with smartphones, an easy way
- ❑ in USA, payment is made with credit cards

Conclusion:

*Smart store (smartphone + store) is just
a beginning*

Smart Store – The Case

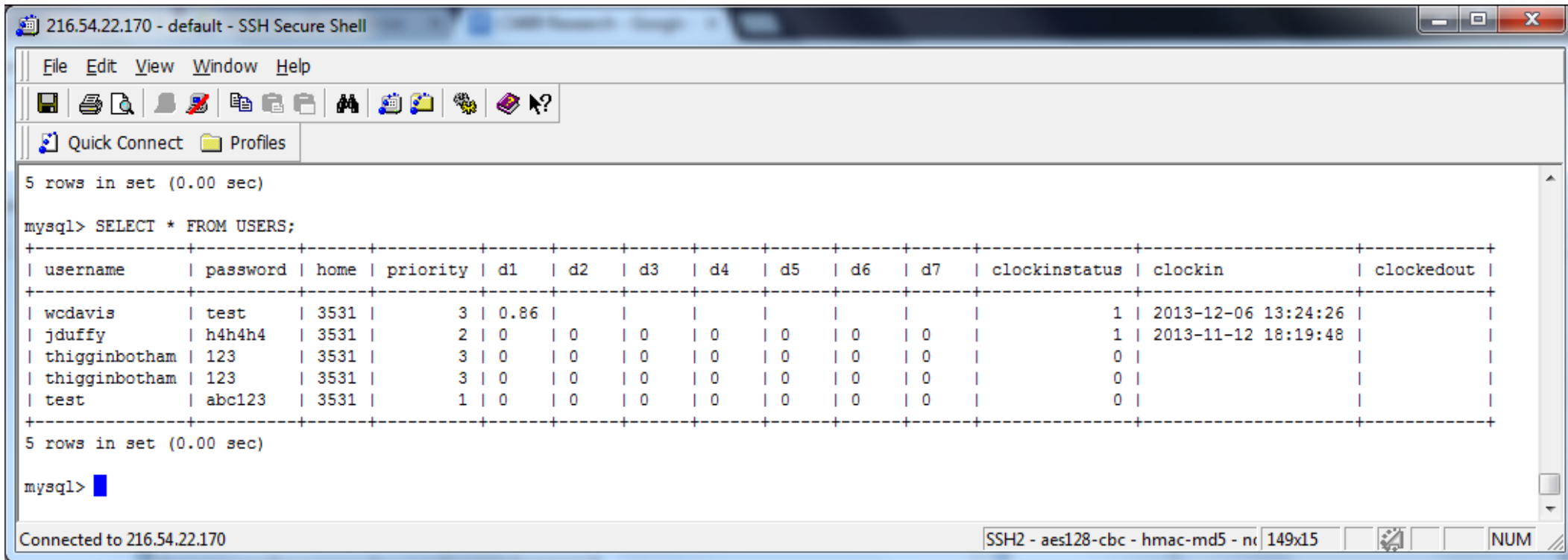
A mobile retail POS (example):

URL -

<http://zeus.vwc.edu/~wcdavis/CS489index.html>

Smart Store – Design I

Three tables: Users (shown below), Store, and Item.



The screenshot shows an SSH Secure Shell window titled "216.54.22.170 - default - SSH Secure Shell". The window contains a terminal window with a MySQL prompt. The query executed is "SELECT * FROM USERS;". The result is a table with 13 columns: username, password, home, priority, d1, d2, d3, d4, d5, d6, d7, clockinstatus, clockin, and clockedout. The table contains 5 rows of data.

```
5 rows in set (0.00 sec)

mysql> SELECT * FROM USERS;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| username      | password | home | priority | d1  | d2  | d3  | d4  | d5  | d6  | d7  | clockinstatus | clockin           | clockedout |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| wcdavis       | test     | 3531 | 3        | 0.86 |      |      |      |      |      |      | 1             | 2013-12-06 13:24:26 |              |
| jduffy        | h4h4h4   | 3531 | 2        | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 1             | 2013-11-12 18:19:48 |              |
| thigginbotham | 123      | 3531 | 3        | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0             |                    |              |
| thigginbotham | 123      | 3531 | 3        | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0             |                    |              |
| test          | abc123   | 3531 | 1        | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0             |                    |              |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+

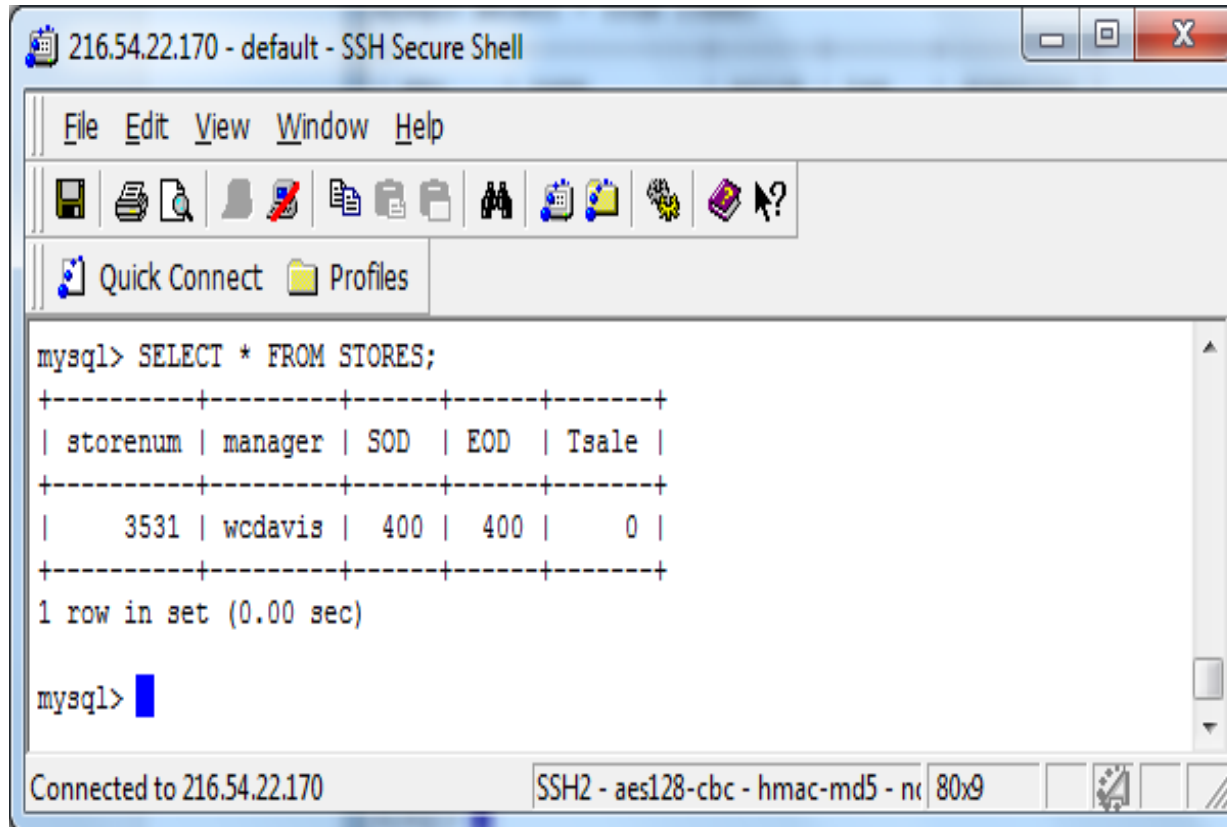
5 rows in set (0.00 sec)

mysql>
```

Connected to 216.54.22.170

Smart Store – Design II

Three tables: Users, Store (shown below), and Item.



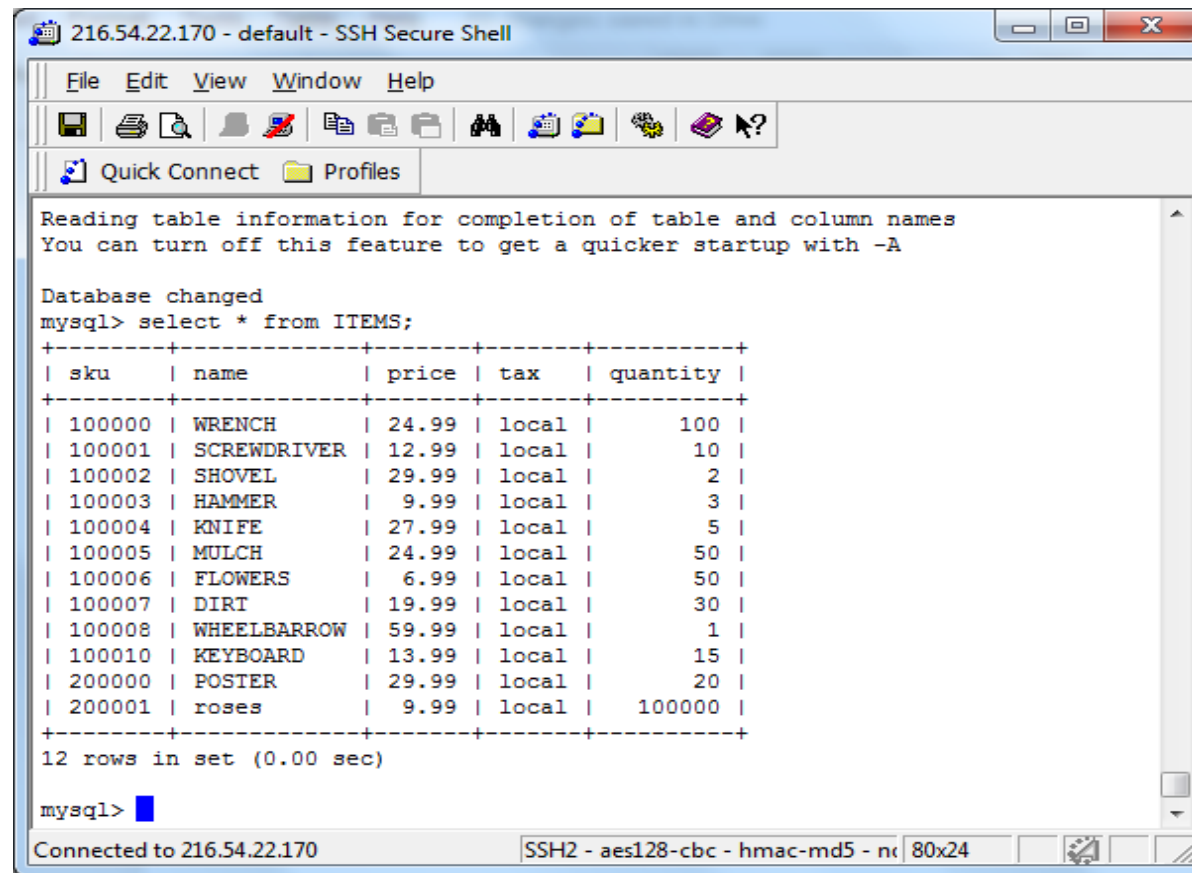
The screenshot shows a terminal window titled "216.54.22.170 - default - SSH Secure Shell". The window contains a MySQL command prompt where the query "SELECT * FROM STORES;" has been executed. The result is displayed as a table with one row. The table has columns: storenum, manager, SOD, EOD, and Tsale. The values in the row are: 3531, wcdavis, 400, 400, and 0. The terminal also shows "1 row in set (0.00 sec)" and the prompt "mysql>" with a cursor.

```
mysql> SELECT * FROM STORES;
+-----+-----+-----+-----+-----+
| storenum | manager | SOD | EOD | Tsale |
+-----+-----+-----+-----+
|      3531 | wcdavis | 400 | 400 |      0 |
+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql>
```

Smart Store – Design III

Three tables: Users, Store, and Item (see below).



The screenshot shows an SSH terminal window titled "216.54.22.170 - default - SSH Secure Shell". The terminal displays the output of a MySQL query. The query is "mysql> select * from ITEMS;". The result is a table with 12 rows and 5 columns: sku, name, price, tax, and quantity. The data is as follows:

sku	name	price	tax	quantity
100000	WRENCH	24.99	local	100
100001	SCREWDRIVER	12.99	local	10
100002	SHOVEL	29.99	local	2
100003	HAMMER	9.99	local	3
100004	KNIFE	27.99	local	5
100005	MULCH	24.99	local	50
100006	FLOWERS	6.99	local	50
100007	DIRT	19.99	local	30
100008	WHEELBARROW	59.99	local	1
100010	KEYBOARD	13.99	local	15
200000	POSTER	29.99	local	20
200001	roses	9.99	local	100000

The terminal also shows the message "12 rows in set (0.00 sec)" and the prompt "mysql>".

Smart Store – Implementation

Tools used: PHP/MySQL, CSS, HTML, JavaScript

```
function mysql_evaluate($query, $default_value="undefined")
{
    $result = mysql_query($query);
    if (mysql_num_rows($result)==0)
    {
        return $default_value; }
    else
    {
        return mysql_result($result,0); }
}

$value = mysql_evaluate("SELECT price FROM ITEMS WHERE sku = '$item'",
"DEFAULT_TYPE");
```

Smart Store – Interface I

The screenshot shows a mobile browser interface. At the top, the status bar displays '中国联通' (China Unicom), signal strength, Wi-Fi, the time '9:32 PM', and a 69% battery level. The address bar contains 'zeus.vwc.edu' with a refresh icon. The main content area has a light blue background and is titled 'Start of Day'. It contains three input fields: 'Please enter your username:' with 'wcdavis', 'Please enter your password:' with four dots, and 'Please enter which store you are operating from:' with '3531'. Below the fields are 'Submit' and 'Reset' buttons.

中国联通 9:32 PM 69%

zeus.vwc.edu

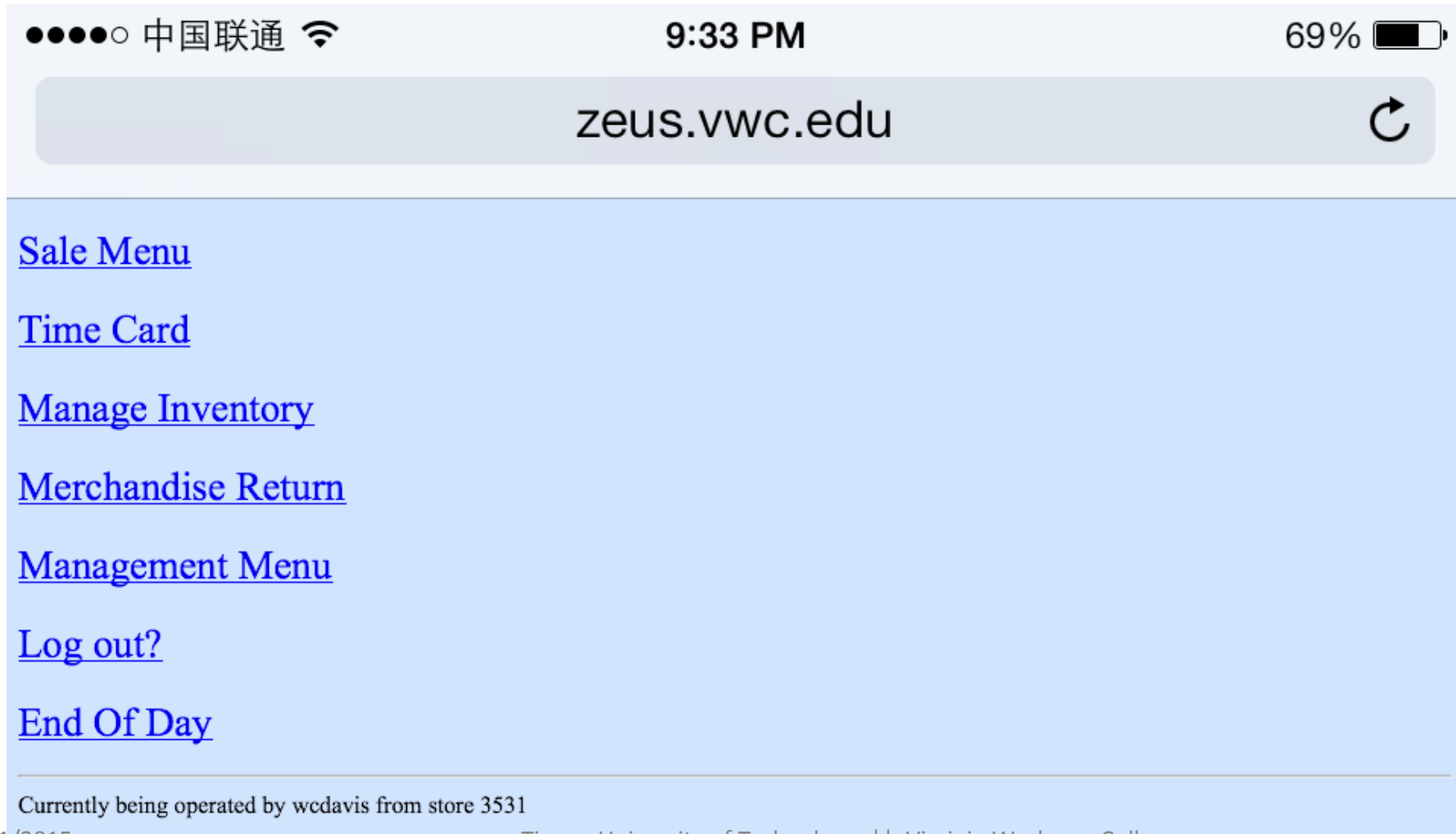
Start of Day

Please enter your username:

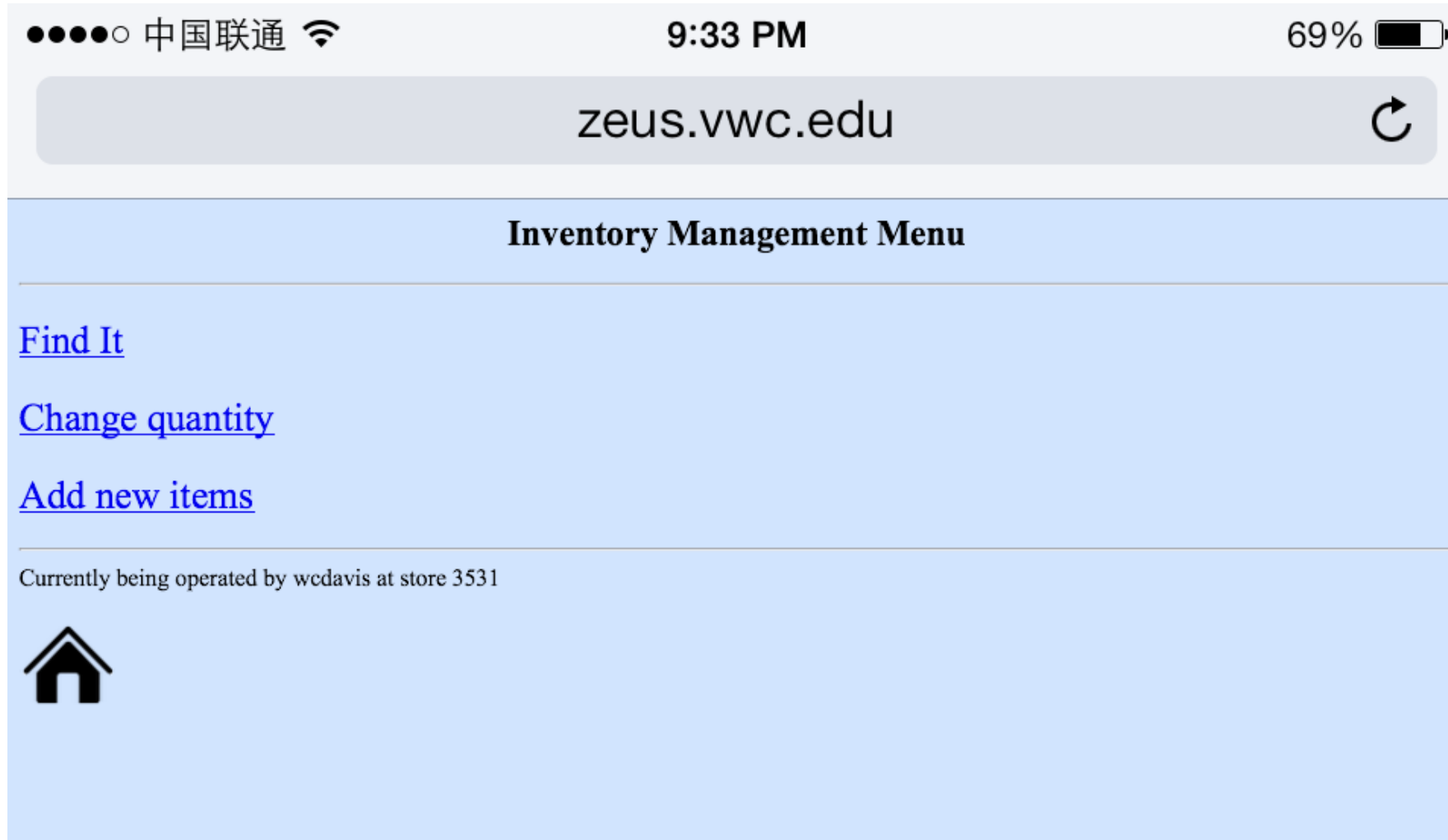
Please enter your password:

Please enter which store you are operating from:

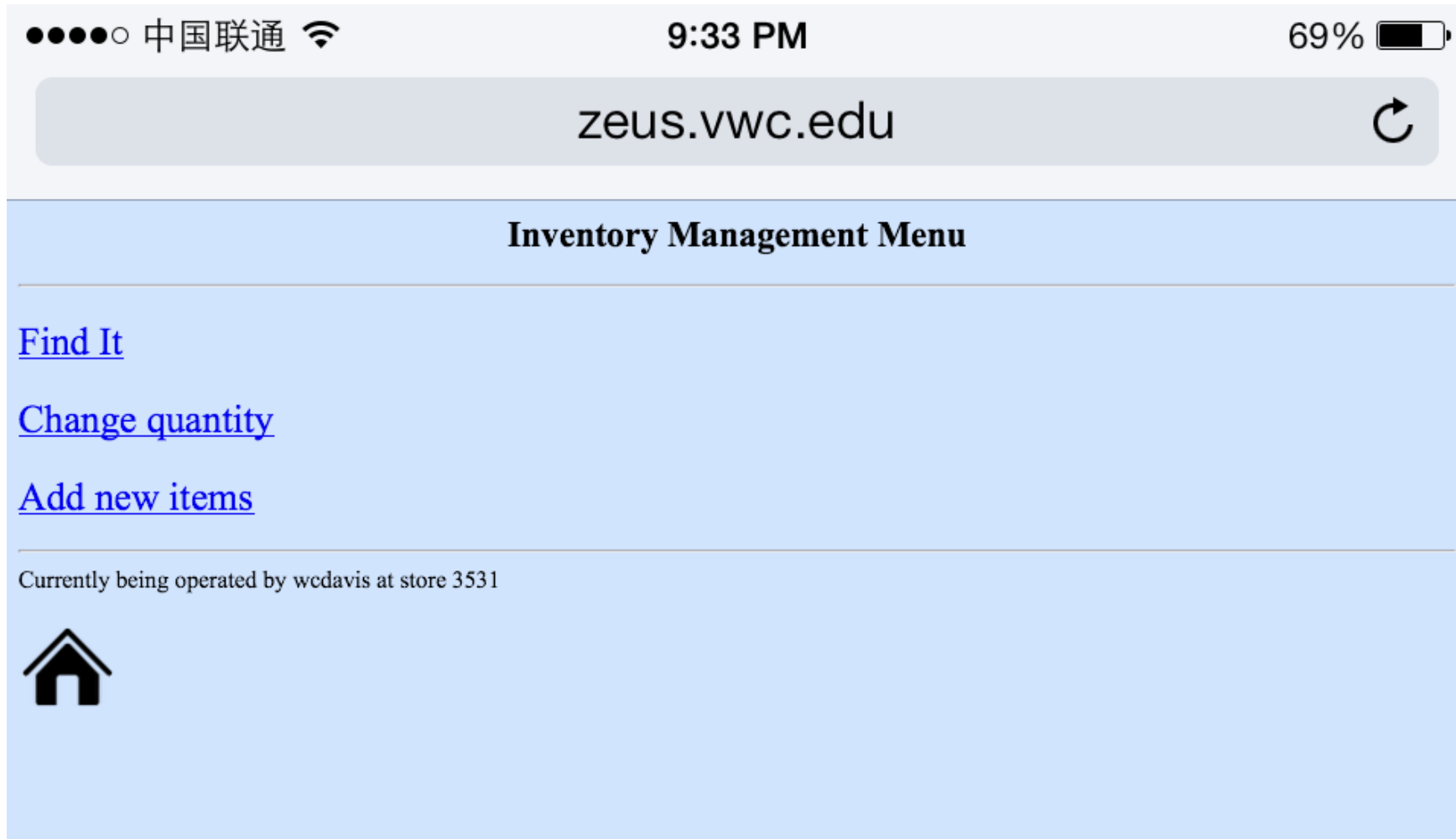
Smart Store – Interface II



Smart Store – Interface III



Smart Store – Interface IV



Conclusion

Smart store is just a beginning

Thank you for your comments!