KEYNOTE ADDRESS
PUBLIC FINANCIAL MANAGEMENT:
The Past is Prologue/The Future is Fearsome

A look backward and forward at PFM and ICGFM experience and technology

Jim Wesberry
Past President of the International Consortium on Governmental Financial Management at its 30th Annual International Training Conference

May 16, 2016, Miami, Florida, USA
“At fifteen, I aspired to learning. At thirty, I established my stand. At forty, I had no delusions. At fifty, I knew my destiny. At sixty, I knew truth in all I heard. At seventy, I could follow the wishes of my heart... ...without doing wrong.“

....Confucius
Since I have now lived longer than Confucius, I can add:

At eighty, I can be outspoken from my heart and mind openly and sincerely giving no mind to whether someone becomes offended.

.....JW
Calculator
Weight 100 pounds

Adding Machine
Weight 40 pounds
Book keeping machine
What was Computing Like Before the 1401?

- Data was stored in punched cards called "IBM cards" or "Hollerith cards"
  - Named after Herman Hollerith.
- 80 columns per card, one character per column.
- Up to 12 punched holes per column.
- Alphanumeric data, often grouped into fields.
What was Computing Like Before the 1401?

- A data processing application involved passing decks of punched cards through electromechanical "unit record" machines.

- Repetitive sort, calculate, collate, and tabulate operations ...
  - ... were programmed with hand-wired plugboard control panels.
IBM 1620 computer system with disc drive, paper tape unit, core storage unit (20K-60K), card reader/punch, line printer
Data Processing

FIG. 6-1 The punched-card data processing cycle
Running a Data Processing Application ...

- ... meant passing decks of cards through a sequence of unit-record machines.
  - Each machine was programmed via its plugboard to perform its task for the application.
  - Each machine had little or no memory.
  - The punched cards stored the data records
  - The data records moved as the cards moved.

An entire work culture evolved around punched cards!
IBM 1401 Data Processing System
IBM System/360 Model 30, could perform up to 34,500 instructions per second, with memory from 8 to 64 KB
“WELL BOUND” MULTICOLUMNAR ACCOUNTING BOOK
MORTIMER A. DITTENHOFFER
January 13, 1914 - March 4, 2016
Excellent Information Sources on PFM in LAC

**English**

Interamerican Development Bank: *Public Financial Management in Latin America*  
*The Key to Efficiency and Transparency*, 2015  
[https://goo.gl/ceJ5Mb](https://goo.gl/ceJ5Mb)

**Spanish**

Banco Interamericano de Desarrollo: *Gestión financiera pública en América Latina:*  
*La clave de la eficiencia y la transparencia*, 2015  
[https://goo.gl/e4Nl1H](https://goo.gl/e4Nl1H)
Excellent Information Source on PFM in LAC

US Agency for International Development:
http://goo.gl/SIauAQ
The Internet

• “Originated as a defense effort to secure computer communications against an attack, Arpanet, as it was then called, linked four sites in the decade of the "60s.
• By 1975 it had grown to about 100 sites, primarily universities and others doing defense work and research. Another 100 sites had joined by 1983.
• In 1995 there were an estimated 12 million computers linked to the Internet, half of them permanently attached, the rest PCs and laptops only intermittently on line.”

--- 1995 ICGFM Miami Conference
Internet Users in the World

- Internet Users

- Internet Users in the World

- Internet Users

- Internet Users

- Internet Users

- Internet Users

- Internet Users

- Internet Users

- Internet Users

- Internet Users

- Internet Users

- Internet Users

- Internet Users
## Time in Years Taken to Reach 50 Million Users

<table>
<thead>
<tr>
<th>Technology</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephone</td>
<td>75</td>
</tr>
<tr>
<td>Radio</td>
<td>38</td>
</tr>
<tr>
<td>TV</td>
<td>13</td>
</tr>
<tr>
<td>WWW</td>
<td>4</td>
</tr>
<tr>
<td>MP3</td>
<td>3</td>
</tr>
<tr>
<td>Facebook</td>
<td>2</td>
</tr>
<tr>
<td>Smartphone</td>
<td>1</td>
</tr>
</tbody>
</table>
“We stand on the brink of a technological revolution that will fundamentally alter the way we live, work, and relate to one another. In its scale, scope, and complexity, the transformation will be unlike anything humankind has experienced before.”

- Klaus Schwab, Founder and Executive Chairman, World Economic Forum
Navigating the next industrial revolution

<table>
<thead>
<tr>
<th>Revolution</th>
<th>Year</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1784</td>
<td>Steam, water, mechanical production equipment</td>
</tr>
<tr>
<td>2</td>
<td>1870</td>
<td>Division of labour, electricity, mass production</td>
</tr>
<tr>
<td>3</td>
<td>1969</td>
<td>Electronics, IT, automated production</td>
</tr>
<tr>
<td>4</td>
<td>?</td>
<td>Cyber-physical systems</td>
</tr>
</tbody>
</table>

WEF Video The Fourth Industrial Revolution at https://www.youtube.com/watch?v=khjY5LWF3tg
During the Next Decade

- The amount of time and effort required for data collection and validation will be substantially reduced.

- Data analysis tools and software will greatly increase the opportunities to provide government with
  - analysis,
  - performance management, and
  - decision-support services.
GROWTH IN THE INTERNET OF THINGS

THE NUMBER OF CONNECTED DEVICES WILL EXCEED 50 BILLION BY 2020

BILLIONS OF DEVICES

Source: Cisco
RECENT TRENDS (1)

• Sensors and actuators, that capture more data and impressions from more objects in more places

• Ubiquitous computing and hyper connectivity, which exponentially increase the flow of data.

• Nanotechnology and nanomaterials, to build ever more complex devices at microscopic scale.
Artificial intelligence: algorithms increasingly capable of making decisions based on past performance and desired results.

Vision as an interface to participate in and control augmented and virtual reality.

Blockchain technology, making all kinds of digital transactions secure, verifiable, and potentially automatic.
There will certainly be a drastic need for someone to try to provide, assure or restore credibility to institutions and the information they produce. This clearly should be a major role of financial managers and auditors.
Whether a form of government varies from strongly autocratic to purely democratic nature or from socialist to capitalist, there will always be a need for someone to assure and attest to the credibility of just about everything.
The Next 30 Years

The three main current trends that will impact PFM most will be:

• Additive Manufacturing (3D printing)
• The Internet of Things (IoT)
• Blockchain technology
Digital fabrication will allow governments to design and produce tangible objects on demand, wherever and whenever they need them or to contract a local company to fabricate them.
The Internet of Things will offer advanced connectivity of devices, systems, and covering a variety of protocols, domains, and applications.

The interconnection of the embedded devices will to usher in automation in nearly all fields, while also enabling advanced applications and expanding to areas such as “smart cities.”

Once all properties of a governmental unit are interconnected, the long time problem of controlling assets and knowing where they are will at last be solved.
Blockchain

“A system that’s secure without a higher authority, distributed across many strangers’ computers, yet tamper-proof, and promises a mechanism for trust mediated directly between individuals”.
Blockchain

A technology that underpins digital currencies and ensures that all transactions are properly conducted and recorded.

It provides a distributed means to guarantee and verify transactions

But what is stored on the blockchain need not be just a currency unit – it can be put to all manner of other interesting uses.
“Blockchain technology could underpin the internet of things, safeguarding our privacy, reducing cost, and ensuring the next wave of change in the digital realm puts real control in the hands of those who are accountable.”
Blockchain

“It is no longer about cryptocurrencies really but about the potential of third party-free transfer. That can involve entirely different cultural interactions than just seeing value as meaning money. For example, we could see voting and collective decision-making without the use of third-party control. The future can involve all kinds of creative exchange between human (and even digital) beings that are direct, private when wanted, and totally in the hands of sender and receiver.”
How a blockchain works

1. A wants to send money to B

2. The transaction is represented online as a 'block'

3. The block is broadcast to every party in the network

4. Those in the network approve the transaction is valid

5. The block then can be added to the chain, which provides an indelible and transparent record of transactions

6. The money moves from A to B
I have tried to make three points today:

1. *Be guided by the past as you pursue the present and prepare for the future.*

2. *Maximize the use of technology.* You cannot avoid it.

The Hyperchange Victim's Serenity Prayer

God give us the grace to accept with serenity the change that technology brings,
- the foresight to prepare for it in advance,
- the courage to manage it if we can, and
- the wisdom to accept it... whether we like it or not.
God bless you, Your countries and this Hyperchanging Planet

Jim Wesberry

jimwes.com