

Above All : The Cloud

Knowledge Management Beyond Desktops!

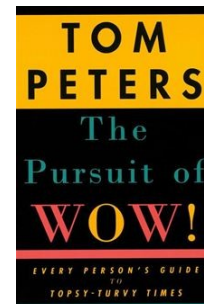
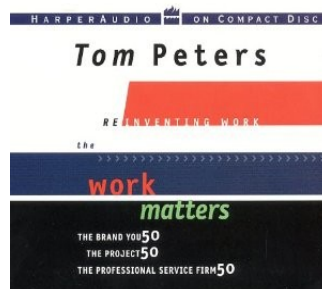
By Ben Thum ben@siacad.com

Synopsis : This paper chronicles part of the journey taken by an IT company formed by the Singapore Institute of Architects in providing and supporting its members with cutting edge technologies. There have been hits and some misses but what is really crucial is the thinking / decision making processes involved and the courage to jump straight into new technologies, reinvent, repackage them and collaborate with the profession in the discovery, experimentation and exploration of new frontiers. In line with the theme of this conference, the focus will be on “Future”, “BIM” and “Cloud”.

1. Prologue

In late 2000, the **Singapore Institute Of Architects**¹ decided to form a commercial company to assist their members with their IT needs. The reasons for this were obvious. IT tools, skills and knowledge are crucial for productivity and effectiveness. It forms a major cost of running any firm. Back then we were just recovering from the Asian Financial and one of the goals is for “cost-effective” IT solutions. To do so, we have to develop our own solutions or seek out alternative solutions... away from the tried, tested, and tired mainstream solutions.

We called the company “**SIACAD**”² as back then CAD was still (perhaps still is now) the most sought after tool for architects. To remind us of our mission, goals and directions, we coined the slogan “**Reinventing The Profession!**”. Actually, this was based on the book “**Reinventing Work**”³ by Tom Peters.



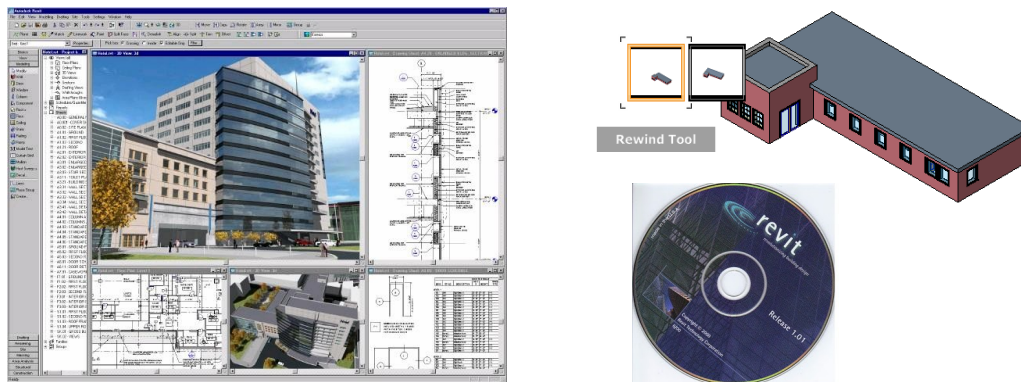
We were also heavily influenced by Tom's 1994 book “**The Pursuit Of Wow**”⁴. Both these slogans have been the guiding light for all our software development, training and support activities.

Almost immediately after the formation of the company, we developed and released a CAD add-on called “**SIACAD**” for AutoCAD, FastCAD, IntelliCAD, VectorWorks and MicroStation. This add-on enables CAD users to easily produce drawings that were **CP83**⁵ compliant – critical for e-Submission in Singapore. Most of the projects done by practitioners in Singapore made use of our **SIACAD** add-on. In fact, it's still being used by many firms today.

2. Welcome To The Future

Our **SIACAD** add-on “added” some extra intelligence into the normal 2D CAD drawing. It automatically organised “layers” and “symbols”. In fact, it made the 2D CAD drawing so well-organised that in 2004, when BCA made “**Buildability Score Assessment**”⁶ mandatory, we simply wrote an extension called “**eBDAS**” and it was able to do all the complex buildability score computations. In fact, we took that to the limit and even included a bill of quantities feature.

We realised back in 2001 that 2D CAD has its limitations. We began to explore BIM. At that time, **ArchiCAD** from **Graphisoft**⁻⁷ was practically the main solution. Until we chanced upon a small Massachusetts-based company which was developing a “parametric building modeler” specifically designed for the AEC industry. It was called “**Revit**”⁻⁸.



Perhaps the most unique feature of **Revit** (at that time) was “parametric / links”. You make a change somewhere in your model, it automatically checks the “collisions / validity” and makes the necessary updates. We downloaded the evaluation and communicated with the developers. I am not sure if the term “BIM” (Building Information Model) has been used prior to that but it was certainly a term that was introduced to us by **Revit**.

In late 2001, a team from **Revit Technologies** visited us and offered to be a distributor.. perhaps the first in Asia. Besides “parametric linkages”, **Revit** was not a software that you “bought”. There is no upfront investments. You pay as you use. It was like USD100 per user per month. We knew that this was the “future” that we were looking for.

We got a group of architects excited about “BIM” and developed a hands-on training program to get them up and going within 2 days. Surprisingly, most of the early adopters were bosses / principals of their own firms. Perhaps back then BIM wasn't as sophisticated (complex?) as it is now. To add more “WOW” to the program, we developed our own object libraries and even wrote an add-on that enabled such object libraries to be easily searched and automatically inserted into the BIM model. It was a big deal then. **Revit** didn't have “API's” (Application Programming Interface). In other words, it couldn't be controlled outside of Revit. But we did it. It created a lot of buzz around.

Just when we thought we had the future sorted out, **AutoDesk**⁻⁹ bought up **Revit Technologies** for USD133 million. It was a shock to the industry. At first, we thought it was just a joke as the announcement was made on 1st April 2002. **AutoDesk** had different ideas on how **Revit** should be distributed. The first thing they did was to remove the “pay-as-you-use” business model. We didn't want to be part of that and we reckoned that it will take a few years for the dust to settle. We said back then that we will wait it out.. for **Revit** to come back to us.

To replace the loss of **Revit**, we brought in “**SketchUp**”⁻¹⁰. It's not BIM but it's 3D and is very easy to use for Design and Communication. People laughed at us and said that it was a “toy”. Today, **SketchUp** is the most commonly-used 3D solution and we are one of the biggest distributor / training centre in ASIA. Now, it also has parametric features and an excellent API.

Jumping into the “future” prematurely with **Revit** was a painful lesson. But there are some lessons that we picked up that enabled us to embark on our next / biggest software development project.

3. Knowledge Management

In 2001, **Architects 61**⁻¹¹ came to us and wanted us to write a “Time-Sheet” reporting program. The reasons were obvious. They wanted a better / faster way to record time-sheets and generate reports. Back then this process was almost certainly a manual process or with a bit of Excel thrown in. Another medium-sized firm **Liu & Wo**⁻¹² followed by **AWP**⁻¹³ wanted the same solution.

[illegible]

#	Date	DoW	First In	Last Out	Worked Time	Regular Time	Over Time	Paid Time	Absence Time
1	Aug-06-2007	Mon	6:00 AM	1:16 AM	15:16	15:16	00:00	15:16	00:00
2	Aug-07-2007	Tue	7:59 AM	6:45 PM	10:46	10:46	00:00	10:46	00:00
3	Aug-08-2007	Wed	7:18 AM	5:30 PM	09:42	09:42	00:00	09:42	00:00
4	Aug-09-2007	Thu	7:51 AM	12:00 PM	04:09	04:09	00:00	04:09	00:00
5	Aug-10-2007	Fri			00:00	00:00	00:00	00:00	00:00
				36 PM	01:30	01:30	00:00	01:30	00:00
				3 PM	09:04	09:04	00:00	09:04	00:00

Shift Out	Worked Time	Regular Time	Over Time	Paid Time	Absence Time
5 PM	09:30	09:30	00:00	09:30	00:00
5 PM	11:30	11:30	00:00	11:30	00:00
4 PM	09:23	08:26	00:57	09:23	00:00
	00:00	00:00	00:00	00:00	00:00
Week Total:	30:23	29:26	00:57	30:23	00:00
Month Total:	80:50	79:53	00:57	80:50	00:00

TIMESHEET

Authorised Timesheets must be given to St. Margaret's before 10:00am each week.

CUSTOMER NAME: _____

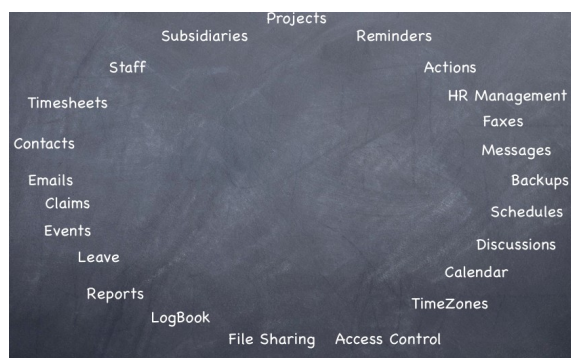
CLIENT COMPANY: _____

EMPLOYEE: _____

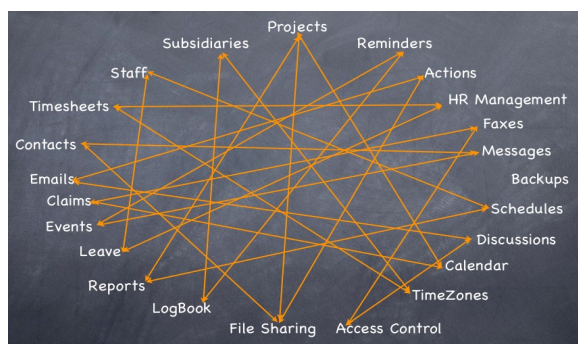
WORKING HOURS: _____

Day	Start Time	Finish Time
Example	08:00	17:00
Monday	8:00	17:00
Tuesday	2:30	16:00
Wednesday		
Thursday		
Friday		
Saturday		
Sunday		

For security, this form is sent to you without your name and must be filled in by you.



A lot of these bits of information although seemingly unique are indeed inter-related.



Projects

Subsidiaries

Actions

Staff

Reminders

Calendar

HR Management

Faxes

Messages

Backups

Schedules

Discussions

Timesheets

Access Control

Holidays

File Sharing

TimeZones

Reports

Leave

Events

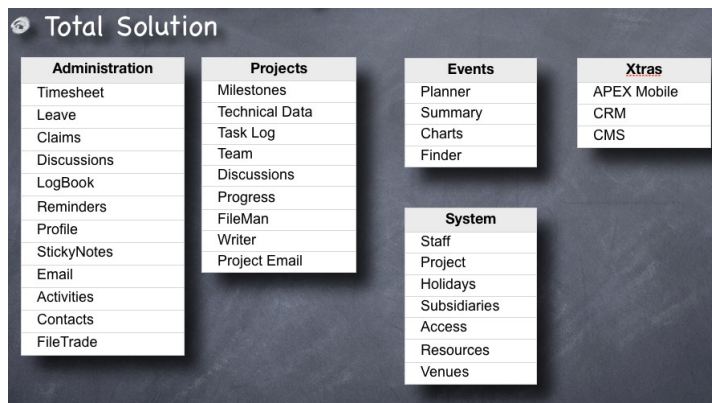
Emails

Claims

Contacts

In short, the information is “parametrically linked”.

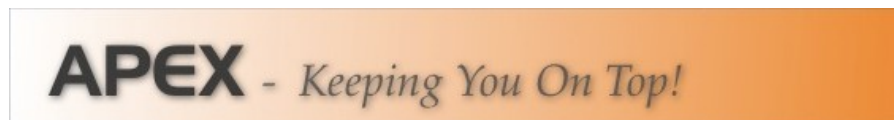
We actually toyed with the notion of “parametrically linked” information way before we dabbled with **Revit**. But the brief encounter with **Revit** reinforced this approach. In fact, we generate so much (redundant) information daily that we are always overwhelmed. In fact, it's not even useful information but bits of unrelated data. It's only when Information (or data?) is linked together that we can arrive at what is known as knowledge.



Based on this “parametrically-linked” approach, we developed the other relevant modules like Leave, Projects, Claims, Email, File Exchange, Contacts, Project Reports etc.

For the first time, there is now a one-point solution to keeping you on top of all these otherwise unrelated bits of information.

We call this solution **APEX** and the slogan is “**Keeping You On Top!**”¹⁴

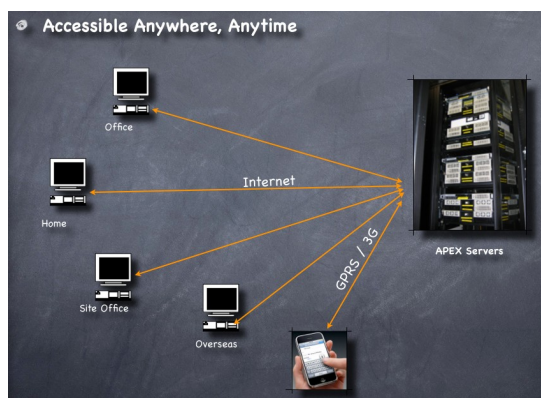


APEX is a web-based client-server solution. The entire program runs on a web server and users connect and use **APEX** via an web browser on their desktop. Nothing else needs to be installed on the desktop. Back in 2001- 2002, internet access was slow and expensive. Hence **APEX** was run in-house on an “intranet” web-server. There is indeed a cost involved in setting up and maintaining an in-house server. Basically only medium-sized and large firms can afford to have such a setup.



In 2003, the **SARS** epidemic swept through most of ASIA. Singapore was badly hit. It was not just locally but many firms have already gone regional and they were barred from getting in / out of the country. We had to relook at the internet and run **APEX** fully on-line. By 2004, the internet speeds were fast enough with the availability of 128KB Broadband. That was a far cry from today's commonly available 25MB Broadband. Nevertheless, we decided to take the plunge.

We started re-developing **APEX** to run completely on the Internet in 2004 but it was only in 2007, with **APEX 6.0**, that we managed to migrate most of our users entirely to the Internet. What is even more important is that with the Internet version, we changed our business model to a pay-as-you-use monthly subscription system. This is flexible and enabled firms to manage their costs more effectively.



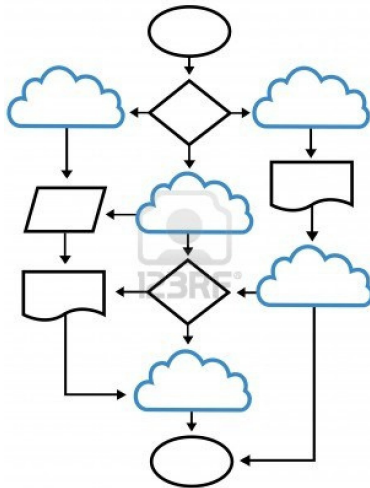
APEX 6.0 took us 2 years to develop. We had to develop technologies that enables the interface from the browser to the server seamlessly and fast. More important still was the availability of mobile devices, in particular the iPhone. Earlier versions of **APEX** already supported mobile devices like **Windows CE**, **Symbian** and even **Palm**. But **iPhone** with it's new interface made it imperative for us to relook at interfaces on small graphical screens.

It took us another 2 years with the release of **APEX 8.0**⁻¹⁵ before we succeeded in developing all the technologies to have almost real-time experience on your browser although **APEX** is internet-based. As usual, we coined a slogan to best describe this experience *"It's Alive!"*

APEX 8.0 - It's Alive!

Because **APEX 8.0** *"is alive!"*, it prepared our users for the quantum leap into the next level of progress - *"The Cloud!"*.

4. The Cloud



The *"Cloud"* is a fancy name for the internet. The name comes from the use of a cloud-shaped symbol as an abstraction for the complex infrastructure it contains in system diagrams. Cloud computing entrusts remote services with a user's data, software and computation.⁻¹⁶

APEX has been on the "Cloud" since we moved to the Internet. The only difference is that we supplied and maintained all the web servers. We had to pay a local data centre for "rack-space" and hosting. While it was relatively stable, there were some instances of downtime.⁻¹⁶

We already knew about the "Cloud Service Providers" like **Amazon**⁻¹⁷, **Microsoft**⁻¹⁸ etc. But ironically, it was during the **AutoDesk Developer Days 2010**⁻¹⁹ that we realised how important the cloud will be. Why on earth was **AutoDesk** stressing so much on the cloud when their CAD / BIM applications are generally desktop-based? More on this in the next 2 chapters...

It took us most of 2011 to evaluate, test and use different cloud service providers. We finally narrowed down to **Amazon Web Services**. The reasons were obvious. They are the pioneers in this field and have their Asian HQ and data centres right in Singapore. They are more pricey than others but they guarantee uptime of supposedly 99.99999999999999% (that's 15 decimal places!)



To fully exploit the "real" cloud, we decided to rewrite the "core-engine" of **APEX**. We also decided to rewrite most of our browser-end to make use of **HTML5**⁻²⁰. A quick search on google will return lots of matches why *"HTML 5 is not ready for prime time"*⁻²¹. What the heck? Let's give **HTML5** a go! It's not that we have not failed before. But what if we succeed?

We released **APEX 10.0** on **10/10/2011 10:10**⁻²² and retired all our 22 web-servers from the data centre within 2 months. As usual we needed a slogan to best depict this drastic move - *"All Systems Go!"*

APEX 10.0 - All Systems Go!



It costs us almost 4x more to run **APEX** on the Amazon cloud but we are confident that we will benefit in the future, i.e. we don't have to worry about hardware upgrades anymore. Also, we can easily “scale” up or down the amount of disk space or cpu speed as required. Our users also experience at least 4x improvement in speed. More important of all, it freed us from having to worry about hardware and networks. And we have more time to devote to software development.

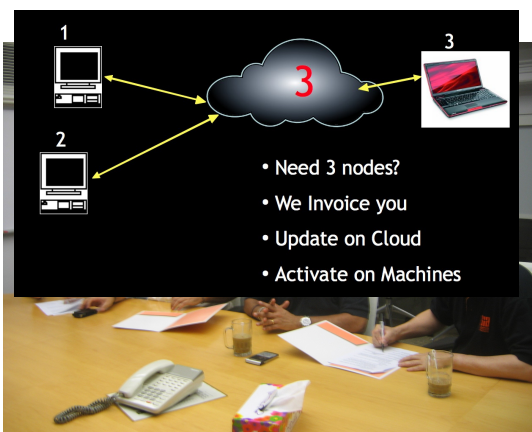
APEX II.O was launched on **11/11/2012 11:11**²³. Because we have more time to focus on software development, we added many new functionalities and improved many of the existing. It is indeed the version with the most improvements and practically covers everything that has been wished by the users. Hence, the slogan for this version is “**Everything Under The Sun!**”

APEX II.O - *Everything Under The Sun!*

Embarking on the cloud isn't just for **APEX** development. We also made use of this for our BIM development.

5. Back To The Future

After we left **Revit**, **AutoDesk** promoted it aggressively. The **Building Construction Authority** of Singapore also gave incentives for firms to migrate to BIM. The emphasis was on e-Submission and the first stage of this submission is for Buildability Scores. There was no automated solution for this in BIM. Users actually exported their BIM model into 2D DWG and used our **2D eBDAS** solution to do the computation. Not only was it slow but prone to inaccuracies.



“Cloud” for **AutoCAD** and BIM!

On 10/8/2010, **AutoDesk** signed an MOU with **SIA** to promote better Revit usage amongst SIA members. One of the additional requirements of that MOU is that **SIACAD** should join as an **AutoDesk Developer Network**²⁴ member. They wanted us to develop add-ons for BIM. What a sense of Deja-Vu!

We joined **ADN** and attended our first **Developer Days 2010** on 9/11/2010 and were briefed on the future development of BIM. What was really amazing was the emphasis on the

We started working on the development of a BIM version of Buildability Scores on **19/04/2011**. Surprisingly, we completed the core programming on **25/04/2011** - a mere 6 days later. Why was this even possible? The short answer to that is BIM itself – it contains all the information regarding the building in the right places. All we needed to do is to write a way to extract and organise the information. It is simply not possible that easily using 2D CAD.

The solution **eBDAS BIM** was beta-tested by **BCA**, **RDCA**, **HDB** and several other firms. Since its release in 25th July 2011, **eBDAS BIM** is perhaps the most sought after add-on for BIM. As usual, we also needed a slogan to best describe what it does. Since it literally counts the walls, doors, windows, floors and columns, it's simply “**You Can Count On It!**”

eBDAS BIM
You Can Count on It!

Level	Item	Score
1st Storey Level	1.1 CURTAIN WALL LEVEL HEIGHT GLASS PARTITION/DRY PARTITION WALL/PREFABRIC...	1.00
2nd Storey Level	1.2 Curtain Wall, Full Height Glass Partition	1.00
3rd Storey Level	1.3 Prefabricated Partition	1.00
4th Storey Level	1.4 Dry Partition: level ceiling plastering, tiling or stone finishes	1.00
5th Storey Level	1.5 Dry Partition: wall with plastering, tiling or stone finishes	1.00
6th Storey Level	1.6 Dry Partition: wall with plastering, tiling or stone finishes	1.00
7th Storey Level	1.7 Dry Partition: wall with plastering, tiling or stone finishes	1.00
8th Storey Level	1.8 Dry Partition: wall with plastering, tiling or stone finishes	1.00
9th Storey Level	1.9 Dry Partition: wall with plastering, tiling or stone finishes	1.00
10th Storey Level	1.10 Dry Partition: wall with plastering, tiling or stone finishes	1.00
11th Storey Level	1.11 Dry Partition: wall with plastering, tiling or stone finishes	1.00
12th Storey Level	1.12 Dry Partition: wall with plastering, tiling or stone finishes	1.00
13th Storey Level	1.13 Dry Partition: wall with plastering, tiling or stone finishes	1.00
14th Storey Level	1.14 Dry Partition: wall with plastering, tiling or stone finishes	1.00
15th Storey Level	1.15 Dry Partition: wall with plastering, tiling or stone finishes	1.00
16th Storey Level	1.16 Dry Partition: wall with plastering, tiling or stone finishes	1.00
17th Storey Level	1.17 Dry Partition: wall with plastering, tiling or stone finishes	1.00
18th Storey Level	1.18 Dry Partition: wall with plastering, tiling or stone finishes	1.00
19th Storey Level	1.19 Dry Partition: wall with plastering, tiling or stone finishes	1.00
20th Storey Level	1.20 Dry Partition: wall with plastering, tiling or stone finishes	1.00
21st Storey Level	1.21 Dry Partition: wall with plastering, tiling or stone finishes	1.00
22nd Storey Level	1.22 Dry Partition: wall with plastering, tiling or stone finishes	1.00
23rd Storey Level	1.23 Dry Partition: wall with plastering, tiling or stone finishes	1.00
24th Storey Level	1.24 Dry Partition: wall with plastering, tiling or stone finishes	1.00
25th Storey Level	1.25 Dry Partition: wall with plastering, tiling or stone finishes	1.00
26th Storey Level	1.26 Dry Partition: wall with plastering, tiling or stone finishes	1.00
27th Storey Level	1.27 Dry Partition: wall with plastering, tiling or stone finishes	1.00
28th Storey Level	1.28 Dry Partition: wall with plastering, tiling or stone finishes	1.00
29th Storey Level	1.29 Dry Partition: wall with plastering, tiling or stone finishes	1.00
30th Storey Level	1.30 Dry Partition: wall with plastering, tiling or stone finishes	1.00
31st Storey Level	1.31 Dry Partition: wall with plastering, tiling or stone finishes	1.00
32nd Storey Level	1.32 Dry Partition: wall with plastering, tiling or stone finishes	1.00
33rd Storey Level	1.33 Dry Partition: wall with plastering, tiling or stone finishes	1.00
34th Storey Level	1.34 Dry Partition: wall with plastering, tiling or stone finishes	1.00
35th Storey Level	1.35 Dry Partition: wall with plastering, tiling or stone finishes	1.00
36th Storey Level	1.36 Dry Partition: wall with plastering, tiling or stone finishes	1.00
37th Storey Level	1.37 Dry Partition: wall with plastering, tiling or stone finishes	1.00
38th Storey Level	1.38 Dry Partition: wall with plastering, tiling or stone finishes	1.00
39th Storey Level	1.39 Dry Partition: wall with plastering, tiling or stone finishes	1.00
40th Storey Level	1.40 Dry Partition: wall with plastering, tiling or stone finishes	1.00
41st Storey Level	1.41 Dry Partition: wall with plastering, tiling or stone finishes	1.00
42nd Storey Level	1.42 Dry Partition: wall with plastering, tiling or stone finishes	1.00
43rd Storey Level	1.43 Dry Partition: wall with plastering, tiling or stone finishes	1.00
44th Storey Level	1.44 Dry Partition: wall with plastering, tiling or stone finishes	1.00
45th Storey Level	1.45 Dry Partition: wall with plastering, tiling or stone finishes	1.00
46th Storey Level	1.46 Dry Partition: wall with plastering, tiling or stone finishes	1.00
47th Storey Level	1.47 Dry Partition: wall with plastering, tiling or stone finishes	1.00
48th Storey Level	1.48 Dry Partition: wall with plastering, tiling or stone finishes	1.00
49th Storey Level	1.49 Dry Partition: wall with plastering, tiling or stone finishes	1.00
50th Storey Level	1.50 Dry Partition: wall with plastering, tiling or stone finishes	1.00
51st Storey Level	1.51 Dry Partition: wall with plastering, tiling or stone finishes	1.00
52nd Storey Level	1.52 Dry Partition: wall with plastering, tiling or stone finishes	1.00
53rd Storey Level	1.53 Dry Partition: wall with plastering, tiling or stone finishes	1.00
54th Storey Level	1.54 Dry Partition: wall with plastering, tiling or stone finishes	1.00
55th Storey Level	1.55 Dry Partition: wall with plastering, tiling or stone finishes	1.00
56th Storey Level	1.56 Dry Partition: wall with plastering, tiling or stone finishes	1.00
57th Storey Level	1.57 Dry Partition: wall with plastering, tiling or stone finishes	1.00
58th Storey Level	1.58 Dry Partition: wall with plastering, tiling or stone finishes	1.00
59th Storey Level	1.59 Dry Partition: wall with plastering, tiling or stone finishes	1.00
60th Storey Level	1.60 Dry Partition: wall with plastering, tiling or stone finishes	1.00
61st Storey Level	1.61 Dry Partition: wall with plastering, tiling or stone finishes	1.00
62nd Storey Level	1.62 Dry Partition: wall with plastering, tiling or stone finishes	1.00
63rd Storey Level	1.63 Dry Partition: wall with plastering, tiling or stone finishes	1.00
64th Storey Level	1.64 Dry Partition: wall with plastering, tiling or stone finishes	1.00
65th Storey Level	1.65 Dry Partition: wall with plastering, tiling or stone finishes	1.00
66th Storey Level	1.66 Dry Partition: wall with plastering, tiling or stone finishes	1.00
67th Storey Level	1.67 Dry Partition: wall with plastering, tiling or stone finishes	1.00
68th Storey Level	1.68 Dry Partition: wall with plastering, tiling or stone finishes	1.00
69th Storey Level	1.69 Dry Partition: wall with plastering, tiling or stone finishes	1.00
70th Storey Level	1.70 Dry Partition: wall with plastering, tiling or stone finishes	1.00
71st Storey Level	1.71 Dry Partition: wall with plastering, tiling or stone finishes	1.00
72nd Storey Level	1.72 Dry Partition: wall with plastering, tiling or stone finishes	1.00
73rd Storey Level	1.73 Dry Partition: wall with plastering, tiling or stone finishes	1.00
74th Storey Level	1.74 Dry Partition: wall with plastering, tiling or stone finishes	1.00
75th Storey Level	1.75 Dry Partition: wall with plastering, tiling or stone finishes	1.00
76th Storey Level	1.76 Dry Partition: wall with plastering, tiling or stone finishes	1.00
77th Storey Level	1.77 Dry Partition: wall with plastering, tiling or stone finishes	1.00
78th Storey Level	1.78 Dry Partition: wall with plastering, tiling or stone finishes	1.00
79th Storey Level	1.79 Dry Partition: wall with plastering, tiling or stone finishes	1.00
80th Storey Level	1.80 Dry Partition: wall with plastering, tiling or stone finishes	1.00
81st Storey Level	1.81 Dry Partition: wall with plastering, tiling or stone finishes	1.00
82nd Storey Level	1.82 Dry Partition: wall with plastering, tiling or stone finishes	1.00
83rd Storey Level	1.83 Dry Partition: wall with plastering, tiling or stone finishes	1.00
84th Storey Level	1.84 Dry Partition: wall with plastering, tiling or stone finishes	1.00
85th Storey Level	1.85 Dry Partition: wall with plastering, tiling or stone finishes	1.00
86th Storey Level	1.86 Dry Partition: wall with plastering, tiling or stone finishes	1.00
87th Storey Level	1.87 Dry Partition: wall with plastering, tiling or stone finishes	1.00
88th Storey Level	1.88 Dry Partition: wall with plastering, tiling or stone finishes	1.00
89th Storey Level	1.89 Dry Partition: wall with plastering, tiling or stone finishes	1.00
90th Storey Level	1.90 Dry Partition: wall with plastering, tiling or stone finishes	1.00
91st Storey Level	1.91 Dry Partition: wall with plastering, tiling or stone finishes	1.00
92nd Storey Level	1.92 Dry Partition: wall with plastering, tiling or stone finishes	1.00
93rd Storey Level	1.93 Dry Partition: wall with plastering, tiling or stone finishes	1.00
94th Storey Level	1.94 Dry Partition: wall with plastering, tiling or stone finishes	1.00
95th Storey Level	1.95 Dry Partition: wall with plastering, tiling or stone finishes	1.00
96th Storey Level	1.96 Dry Partition: wall with plastering, tiling or stone finishes	1.00
97th Storey Level	1.97 Dry Partition: wall with plastering, tiling or stone finishes	1.00
98th Storey Level	1.98 Dry Partition: wall with plastering, tiling or stone finishes	1.00
99th Storey Level	1.99 Dry Partition: wall with plastering, tiling or stone finishes	1.00
100th Storey Level	2.00 Dry Partition: wall with plastering, tiling or stone finishes	1.00

We were in the midst of redeveloping

APEX to be fully cloud-based and it was natural for us to explore some cloud-based features for this BIM Buildability Score project. Since we were not sure what the user reaction may be towards the cloud, we played it safe by using cloud-technologies for licensing, help and support.

The cloud-based licensing control for **eBDAS BIM** is indeed refreshing. Companies with, say, 100 users all over the region can install our **eBDAS BIM** solution in all their computers. They do not need to purchase licenses for all 100 machines. Instead, they can purchase only 3 licenses and our cloud-based licensing system will manage it such that at any one moment in time only 3 concurrent users can use the software regardless of where they may be geographically.

With the success gained by developing a full-featured add-on for **BIM/Revit**, we have received requests to develop other solutions like **“Constructibility”**, **“Green Mark”**, **“Optimise Concrete Design”**. All these requests centre around some act of “counting” and suddenly, after a hiatus of 10 years, we are again the new kids on the block whom they can “count on”.

6. The Near Future

The really cool part of being an **ADN** member, besides having access to all the beta software, documentation and developer support, is the annual **“AutoDesk Developer Days”**. This is where and when developers from the region get together for a day to learn new technologies and basically exchange ideas. This year, it was held on 14th November in Singapore. This is indeed a big deal as we get the inside scoop of what's in store for the near, very near future. After Melbourne, Singapore is the 2nd city for this roadshow, way ahead of USA, Europe and the rest of Asia.

Confidential Information. Sent to all Autodesk Developer Network Members

Autodesk

DevNews

IN THIS ISSUE –
September 27, 2012
SPECIAL EDITION

Registration for Developer Days 2012 is now open

– Dates and locations

Confidential ~ for Autodesk Developer Network members only

SPECIAL EDITION – Registration for Developer Days 2012 is now open; check out the exciting agenda!

As promised in our last DevNews, registration to attend this year's DevDays events is now open. You'll find below the list of cities and dates where these events will be held around the world, as well as a detailed agenda on the latest Autodesk technologies to be presented and discussed at DevDays – desktop, cloud, mobile and more.

Design and Engineering Developer Days	
United States	– Nov. 26, 2012 – At Autodesk University in Las Vegas, Nevada, USA, with DevLab on Nov. 27
North Asia	– Dec. 4, 2012 – Seoul, South Korea – Dec. 6, 2012 – Tokyo, Japan, with DevLab on Dec. 7 – Dec. 10, 2012 – Beijing, China, with DevLab on Dec. 11 – Dec. 11, 2012 – Osaka, Japan – Dec. 12, 2012 – Shanghai, China, with DevLab on Dec. 13
South Asia	– Nov. 12, 2012 – Melbourne, Australia – Nov. 14, 2012 – Singapore, Singapore – Nov. 16, 2012 – Bangalore, India
Eastern Europe	– Nov. 20, 2012 – Moscow, Russia
Western Europe	– Dec. 12, 2012 – Paris, France – Dec. 13, 2012 – Milan, Italy – Dec. 14, 2012 – Farnborough, United Kingdom – Dec. 17, 2012 – Munich, Germany (some German content), with DevLab on Dec. 18 – Dec. 19, 2012 – Gothenburg, Sweden, with DevLab on Dec. 20
Latin America	– Feb. 20, 2013 – S o Paulo, Brazil

I had expected a big turnout as in the past 2 years but this time, there were only 5 of us there – 2 from Thailand, 2 from Malaysia. Perhaps it was due to the Deepavali Holidays the day before but boy, what an awesome insider's only conference they all missed out on! OK, there seemed to be only one singular message but it was loud and clear – everything will go to the cloud very soon whether it's AutoCAD, GIS or BIM.





“Autodesk® BIM 360, the next generation of Building Information Modeling (BIM), is for anyone, anywhere, at any time. Building, infrastructure, design, and construction professionals can access intelligent, model-based workflows through a broad range of cloud-based services within the Autodesk® 360 cloud-based platform that provide mobility, accessibility, and virtually infinite computing power.”²⁵

This isn't even news. **BIM 360** was released 6 months ago. Now, **AutoDesk** is releasing the APIs, Development Toolkit to any developer who wants to join in the excitement. Supporting up to 50 design file formats and also desktop, android and IOS platforms, it will revolutionise the way we use BIM.

Graphisoft is also moving parts of their BIM to the cloud. With the recent release of **ArchiCAD 16**²⁶, they have cloud-enabled the **BIM Components** search and usage functionalities. There is also an upgraded **BIM Server**²⁷, Cloud-integrated model sharing service for BIMx users. The direction is clear. BIM will be cloud-based very soon.

ArchiCAD 16

[Overview](#)
[DESIGN](#)
[BIM Components](#)
[Green](#)
[OPEN](#)
[Productivity](#)
[FAQ](#)

Verneis Library & Cultural Center, Verneis, Norway
Helen & Hart, Norway - <http://www.hls.no> - Photo: © Emile Ashley

[BIMcomponents.com – Cloud-search for BIM Components](#)

Besides BIM, your sundry list type applications like Word, Excel, PowerPoint etc are already cloud-based. You can now subscribe with **Microsoft 365**²⁸ and work on the cloud.

[Send Feedback](#)
[United States \(English\)](#)
[All Microsoft Sites](#)
[Sign In](#)

[SHARE](#)

[Home](#)
[What is Office 365](#)
[Plans & pricing](#)
[Customer stories](#)
[Events](#)
[Support](#)

[Request a call >](#)

Take your Office with you

The familiar tools of Office and all your settings can go with you virtually anywhere now using Office 365.

[See plans and pricing >](#)

See how Office 365 can help your business
Watch the video

For those who want to venture into cloud-based solutions but do not want to commit with any investments or subscriptions, just check out the granddaddy of cloud-based solutions – **Google Apps**²⁹. In fact, you are probably already using some of these cloud-based apps individually. For a firm and an enterprise, it's best to use the entire suite in a collaborative setup with all your staff members. Depending how to set this up, you either pay very little or nothing to move to the cloud. But do be forewarned that these are generic applications and are not in anyway project-centric like **APEX**. But it's a great start, if you still haven't yet.



7. The Battles Ahead

I may have inadvertently painted an overly glossy picture of BIM, Knowledge Management and the Cloud. Implementing any of these isn't just a walk in the park. There is indeed a "scary movie" version. In fact, very often we hear of "uphill battles". There are basically 2 battles that will be fought, not physically but in the minds.

The first battle is internal. Many staff members especially CAD users and "knowledge managers" are too accustomed to the comfort zone provided by existing solutions or workflows. Few people like any kind of change and BIM, especially, is a drastic change. Even those who succeeded in moving completely to BIM had to deal with this battle. What we have realised is that top management must be fully involved with this change. They cannot sit back and leave it to their "IT Manager". Whether you like it or not, the typical IT Manager has little or no knowledge or experience in BIM. Or the Cloud. He will simply see it from the IT angle. But BIM is a process, it's a new workflow which only top management can have a helicopter view of the direction and intended results. Top management, aka the generals, have to make vital decisions. I can still remember vividly how SIA immediate past president Ashvin telling me how **Architects 61** migrated from drafting to CAD. Top management gave a presentation to all the staff highlighting the advantages of CAD and why that is the direction they are heading for. At the end of the presentation, the big boss simply said something to this effect "... anyone who feels this is not the direction we should go, please come to my office after this and I will accept your resignations.". Sounds like another urban legend but there must a reason why Architects 61 is always ahead in IT adoption for BIM and also **APEX**.

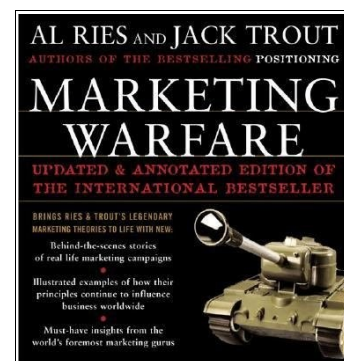
The same battle will be fought when you try to implement a new cloud-based knowledge management system. You will encounter staff, especially older ones, who will insist that the "tried-and-tested-good-old-ways" are better. Many cannot understand why there is a need for change and that "*change is the only constant*" especially in today's context.

The second battle will be fought outside your office. BIM, in particular, is a paradigm shift in technology, workflow and processes. In any such paradigm shifts, there will be winners and losers. The traditional "pecking order" in the Construction Industry is that the Architect is the "leader", followed by the engineers, consultants then the contractors. With BIM, some of the current processes will be made redundant. Some processes may be completely automated as part of the BIM workflow. For instance, bills of quantities and specifications. These can already be done either in BIM directly or using add-ons. So what is the position of the Quantity Surveyor when this gets even more efficient?

Not all consultants, including Architects, are fast in adapting to new technologies. They have valid reasons for this. Architects have probably invested heavily in CAD while Engineers in expensive structural analysis programs. Many cannot stand the pain of dropping what they have now for something new / integrated like BIM. Contractors, on the other hand, invested very little in CAD or

other IT productivity tools. It's not surprising that they are now bypassing the evolutionary step into CAD and hyper-jumping straight into BIM. They can see immediate benefits of using BIM for "collision detection" or taking quantities or cost estimation. With the 4D add-ons, they can use BIM for on-site project management. The take up of BIM by contractors in Singapore is anything short of phenomenal. Dollar for dollar, Contractors in Singapore are spending more on BIM than Architects or Engineers. They are also paying top dollar to employ experienced BIM operators.

The realignment of "pecking order" has already taken place in many countries which have adopted BIM. The "uphill battle" has started whether you are aware or not. Perhaps the only recourse is learn how to fight such a battle. The classic management approach is to seek wisdom from "**Sun Tzu's Art Of War**"³⁰. Personally, I prefer "**Marketing Warfare**"³¹ by Ries and Trout. Actually, the premise behind "Marketing Warfare" isn't exactly "warfare" but "positioning". Logically, if you can "position" your company effectively in this current "constant-change-massive-paradigm-shifts" environment, you will be able to best make use of the situation at hand.

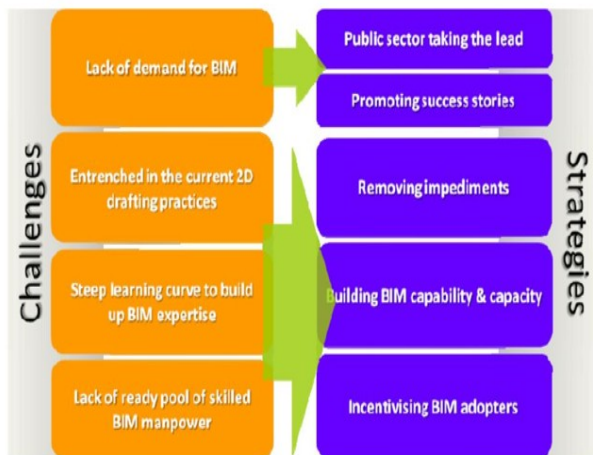


There is another way around this situation – collaborate, join forces. This is particularly effective if you are a group of smaller firms. This has already happened in several firms in Singapore. Different consultants, sometimes even with the contractors, form joint-ventures or consortiums to implement BIM. It makes perfect sense as everyone in this setup will be using the same BIM model, sharing costs.

There is a third battle that will be fought. But consultants / users will not be "fighting". It's between BIM software / cloud service providers. They all know that with any paradigm shift, there will be winners and losers. Remember **Lotus 123**³²? That was the spreadsheet solution on DOS. With the technological shift to Windows, **Excel** has taken over. And basically there will be only one game in town. These sw corporations will want to have technological superiority over their competitor and be the only game in town. Well, as a software user you can expect to get better products, services and pricing when this battle is waged. But you must also be wise to bet on the winning horse. Imagine if you betted on **Lotus 123** when Windows was taking over from DOS. But of course, after the dust settles, there will be other players e.g. OpenOffice. The same happened with Browser Wars. Internet Explorer fought with NetScape. Netscape is gone, IE is there but there is now FireFox, Chrome, Safari.. all of them free of charge.

8. Hope

Of course, it's not all doom and gloom. Governments are fully aware of the benefits of BIM and the Cloud. They are also aware of the amount of money the construction industry contributes to the annual GDP. Many governments starting with USA, South Korea, Singapore and now PRC are all taking proactive steps to move the industry into the right direction. Some are just making it compulsory for all Government projects to be done in BIM. Some are giving cash incentives outright. Some do both – like in Singapore. But of course, there are fine prints and footnotes of what is expected of those who receive these incentives.



BCA Singapore has rolled out a series of cash incentives called the **BIM Fund**³³. Originally, the take up rate was slow. Now that the fund is running low, firms are rushing to get the last bites of the cake. On the whole, those who have taken advantage of this BIM Fund acknowledge that it has helped them make strategic decisions and reduce the direct cost of implementation. More important still is that they are required to do at least one project in BIM in collaboration with another consultant. The collaboration project has indeed elevated even some of the smallest firms into BIM readiness.

Technology Adoption: Building Information Model (BIM) Fund (ENHANCED)

1. What is it?

The Building Information Model (BIM) fund aims to help firms to adopt BIM technology into their work processes to improve their productivity by defraying part of the cost incurred in training, consultancy, software or hardware.



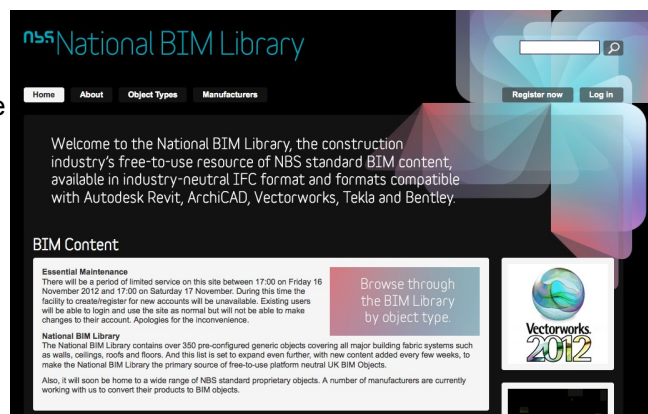
Besides incentives for BIM, the **Infocomm Development Authority of Singapore**³⁴ is actively promoting Cloud adoption:

“IDA’s cloud vision is to sharpen the overall economic competitiveness of Singapore through catalysing demand and adoption in key industry verticals, as well as driving the creation of new products to address business needs, and developing manpower capabilities....”

Some of our **APEX** users have indeed benefited from tax breaks and other cash incentives for using our cloud-based services. Unfortunately, **SIACAD Pte Ltd** is not eligible for any of these development grants as we completed and commercialised our cloud-based implementation in 2011 and this grant is for projects starting in mid-2012. So much for being forward looking and pro-active.

Besides the government, the professional bodies have a big role to play. The **Singapore Institute Of Architects** have played a very active role in technology adoption. The **Institute Of Engineers Singapore** now is also very active.

But the most active institution is perhaps the **Royal Institute Of British Architects**. Just check out their **“National BIM Library”**³⁵. We have been in contact with them and they have stressed that they want to collaborate with institutions in different countries. In fact, they claim institutions from 4 different countries are already in talks with them on collaboration. Perhaps this is a direction that the **RISM** and other institutions can consider to leap frog ahead in BIM implementation.

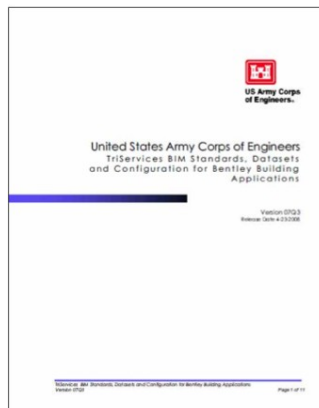


9. RoadMaps



We all love roadmaps to guide us along, especially when it comes to BIM. BCA Singapore together with all the various professional bodies have spent a lot of time producing the “**Singapore BIM Guide**”⁻³⁶. I am also a member of that team and also the “**BIM Steering Committee**”⁻³⁷ headed by BCA.

This Singapore BIM Guide is perhaps the most comprehensive guide in this region. It covers everything from “**BIM Execution Plan**” to “**BIM Modeling Guidelines**”. Besides Singapore, USA⁻³⁹ and Australia⁻⁴⁰ have their BIM guides, roadmaps available on-line:



As with any guides, even if done locally, you have to adapt it to your firm and way of practice. In fact, roadmaps and guides may become irrelevant because of the changes in technologies. For instance, I did a search for “cloud” in the **Singapore BIM Guide** and it returned no matches. The reason for this is obvious. When the draft was started in March 2012, BIM + Cloud is not commonly uttered together in a sentence. Eventually, you have to rely on your gut instincts and ability to understand trends to decide on which direction or “roadmap” to take.

10. Epilogue

I hope this has given some valuable insights into BIM, Knowledge Management and Cloud Implementation. I believe I have given you some real-life accounts of the journey, the failures, the successes and the exciting dreams that will soon be reality in the very near future. Speaking of the near future, at the recent “**Developer Days 2012**”, many new concepts and plans were presented. Many will come to fruition, some may never will. More “solid” information will be available within the “next 2 weeks”.. or the near future. Everything is still in constant flux. What an exciting future we have just ahead!

Besides BIM, **Amazon** has organised the “..first global customer and partner conference”.. on 28-29 November. Aptly themed “**Invent**”⁻⁴¹, there will indeed be exciting new technologies and directions. Even more exciting is that you don't have to be physically in Las Vegas to acquire this knowledge. You can sign up for the “Live Stream Keynotes” or access the presentations from the cloud.

I wrote this entire paper on the morning of 19th November 2012. By the time I actually present on the 26th, there will be would have been new knowledge, directions and concepts. I hope to be able to share such “up-to-minute” knowledge with you. Actually, there can be no simple conclusion to this. Like the “Energizer Bunny”, this will keep going, going and going... even after this conference.

Thank you for giving me the opportunity to share my thoughts with you. I am confident we have an exciting future. And the future is NOW!

References:

- 1 **Singapore Institute Of Architects** : <http://www.sia.org.sg>
- 2 **SIACAD Pte Ltd** : <http://www.siacad.com>
- 3 **“Reinventing Work” - Tom Peters** : <http://www.amazon.com/Project-50-Reinventing-Work-Transform/dp/0375407731>
- 4 **“The Pursuit Of WOW” - Tom Peters** : <http://www.amazon.com/Pursuit-Every-Persons-Guide-Topsy-Turvy/dp/0679755551>
- 5 **“CP83 Layering Standards”** : http://www.corenet.gov.sg/it_standards/cad_classification/cad_stds.html
- 6 **“Buildability Score Assessment”** : http://www.bca.gov.sg/BuildableDesign/buildable_design_buildability_score.html
- 7 **“Graphisoft”** : <http://www.graphisoft.com/>
- 8 **“History Of Revit”** : http://en.wikipedia.org/wiki/Autodesk_Revit
- 9 **“AutoDesk Buys Over Revit”** : <http://www.revitforum.org/out-there/1157-april-1st-revit-history.html>
- 10 **“Trimble SketchUp”** : <http://www.sketchup.com>
- 11 **“Architects 61 Pte Ltd”** : <http://www.a61.com.sg/>
- 12 **“Liu & Wo Pte Architects Ltd”** : <http://www.liuwo.com.sg/web/Site/Main.html>
- 13 **“AWP”** : <http://awparchitects.com/>
- 14 **“APEX – Keeping You On Top!”** : <http://apex.siacad.com/about>
- 15 **“APEX 8.0 – It’s Alive!”** : <http://apex8.siacad.com/about>
- 16 **“Origins Of Cloud Computing”** : http://en.wikipedia.org/wiki/Cloud_computing
- 17 **“Amazon Web Services”** : <http://aws.amazon.com/>
- 18 **“MicroSoft Cloud Computing”** : <http://www.microsoft.com/enterprise/it-trends/cloud-computing/default.aspx#fbid=NgFhmTSLbwl>
- 19 **“AutoDesk Developer Days 2010”** : <http://thebuildingcoder.typepad.com/blog/2010/12/snow-and-woe-with-manifest-files.html>
- 20 **“HTML 5 – Wiki”** : <http://en.wikipedia.org/wiki/HTML5>
- 21 **“Why HTML 5 is STILL NOT ready”** : <http://www.businessinsider.com/bii-report-why-html5-is-still-not-ready-for-prime-time-2012-9>
- 22 **“APEX 10 – All Systems Go!”** : <http://apex10.siacad.com/about>
- 23 **“APEX 11 – Everything Under The Sun!”** : <http://apex11.siacad.com/about>
- 24 **“AutoDesk Developer Network”** : <http://usa.autodesk.com/adsk/servlet/index?id=472012&siteID=123112>
- 25 **“AutoDesk BIM 360”** : <http://usa.autodesk.com/adsk/servlet/pc/index?siteID=123112&id=19676436>
- 26 **“ArchiCAD 16”** : <http://www.graphisoft.com/products/archicad/>
- 27 **“ArchiCAD BIM Server”** : <http://www.youtube.com/watch?v=ouKCLs4UV8E>
- 28 **“Microsoft 365”** : <http://www.microsoft.com/en-us/office365/>
- 29 **“Google Apps”** : <http://www.google.com/enterprise/apps/business/>

- 30 “Sun Tzu Art Of War” : http://en.wikipedia.org/wiki/The_Art_of_War
- 31 “Marketing Warfare” by Al Ries And Jack Trout : <http://www.brandingstrategyinsider.com/2009/06/marketing-warfare-revisited.html>
- 32 “Lotus 123” : http://en.wikipedia.org/wiki/Lotus_1-2-3
- 33 “BCA BIM Fund” : <http://www.bca.gov.sg/BIM/bimfund.html>
- 34 “IDA – Cloud Incentives” : <http://www.ida.gov.sg/Infocomm-Enterprises/Enterprise-Programmes/Cloud.aspx#.UKt9aYUxgyc>
- 35 “National BIM Library” : <http://www.nationalbimlibrary.com/>
- 36 *The Singapore BIM Guide is no longer available for download. However if you do a google search, you may find a cached version floating around somewhere for download.*
- 37 “BIM Steering Committee” : <http://bimsg.wordpress.com/2012/02/01/about-singapore-bim-steering-committee/>
- 39 “U.S. General Services Administration BIM Guide” : http://www.google.com.sg/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCEQFjAA&url=http%3A%2F%2Fwww.gsa.gov%2Fgraphics%2Fpbs%2Fgsa_bim_guide_series_05_version_1.pdf&ei=C36rUJXCfHqrQfTh4D4BA&usg=AFQjCNGTT9PWJSLbF39MxuyFvfNETCvV0A&cad=rja
- 40 “Australia BIM Guide” : <http://www.bim.architecture.com.au/>
- 41 “Amazon - Invent” : <https://reinvent.awsevents.com/livestream.html>