◆ IEEE

www.IEEM.org

The IEEE International Conference on
Industrial Engineering and Engineering Management

10 - 13 Dec 2012,
Hong Kong Convention and Exhibition Centre, Hong Kong

Victoria Habour, Hong Kong

Locating the Key Competitors:
A New Tool for Technology Manager

C.-H. Max Kuan,

National Taiwan University of Science and Technology

M.-H. Huang, National Taiwan University

D.-Z. Chen, National Taiwan University

Content

- Issue to address

- Assumptions and Limitations
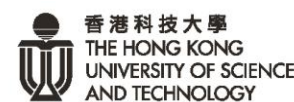
- Methodology

- Empirical Results

www.IEEE.org

The IEEE International Conference on
Industrial Engineering and Engineering Management

10 - 13 Dec 2012,
Hong Kong Convention and Exhibition Centre, Hong Kong

Victoria Habour, Hong Kong

Issue to Address

- To enter a new or unfamiliar market segment,

- If given only limited time and resource,

- If only the bibliometric information contained in patent databases is available,

- can we effectively and efficiently locate the *key players* in the market segment?

◈IEEE

www.IEEM.org

The IEEE International Conference on
Industrial Engineering and Engineering Management

10 - 13 Dec 2012,
Hong Kong Convention and Exhibition Centre, Hong Kong

Victoria Habour, Hong Kong

A Common Scenario

- Some keywords are applied to the patent databases and a set of patents are collected.

- The collected patents' bibliometric information is extracted and fed to some off-the-shelf analysis tool.

- Finally, a number of charts or tables are produced.

- SPONSORS & CO-ORGANIZERS -

◈IEEE

NUS National University of Singapore

NANYANG TECHNOLOGICAL UNIVERSITY

香港科技大學 THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

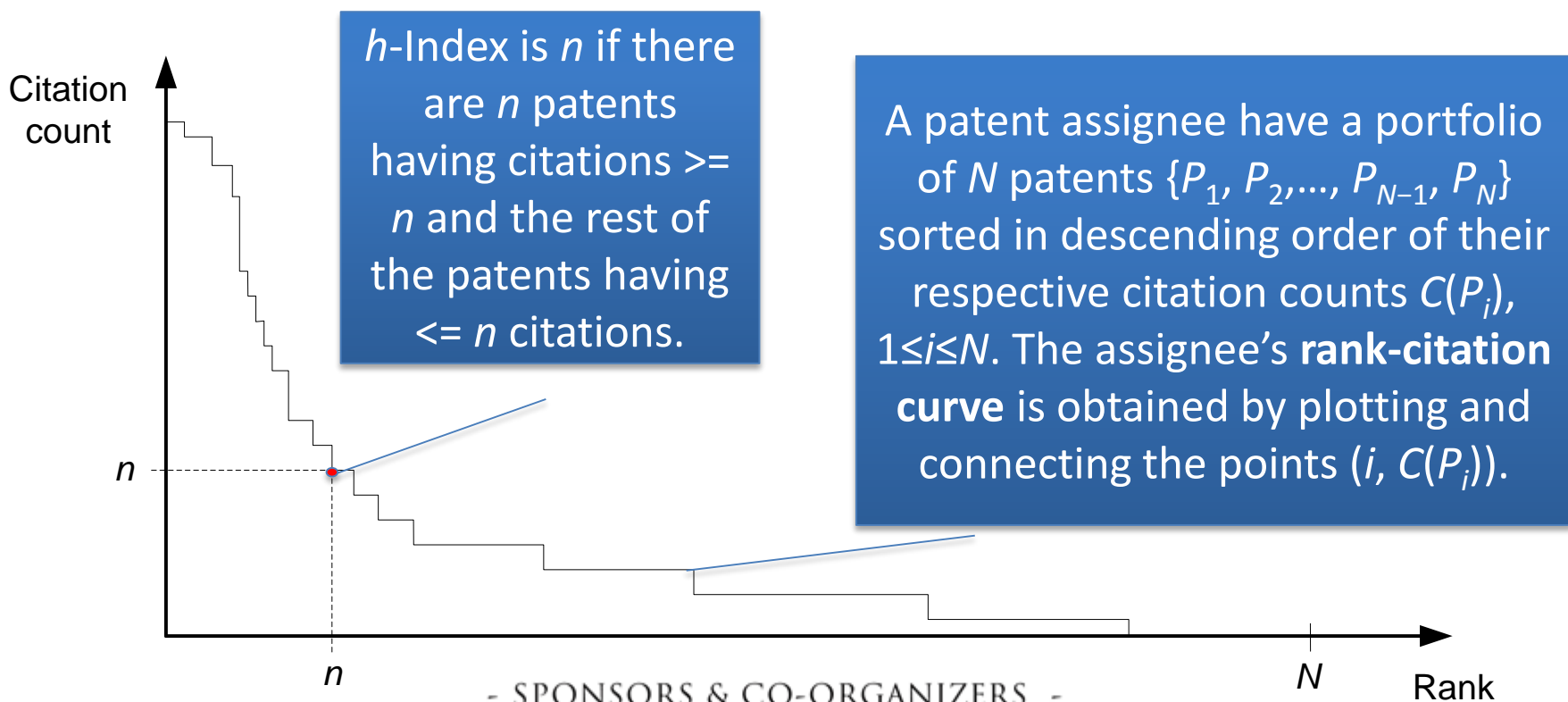香港城市大學 City University of Hong Kong

Assumptions and Limitations

- We evaluate a player only by its number of patents and the citations received by the patents

- The number of citations to a patent is assumed to be an indication to the patent's value or quality

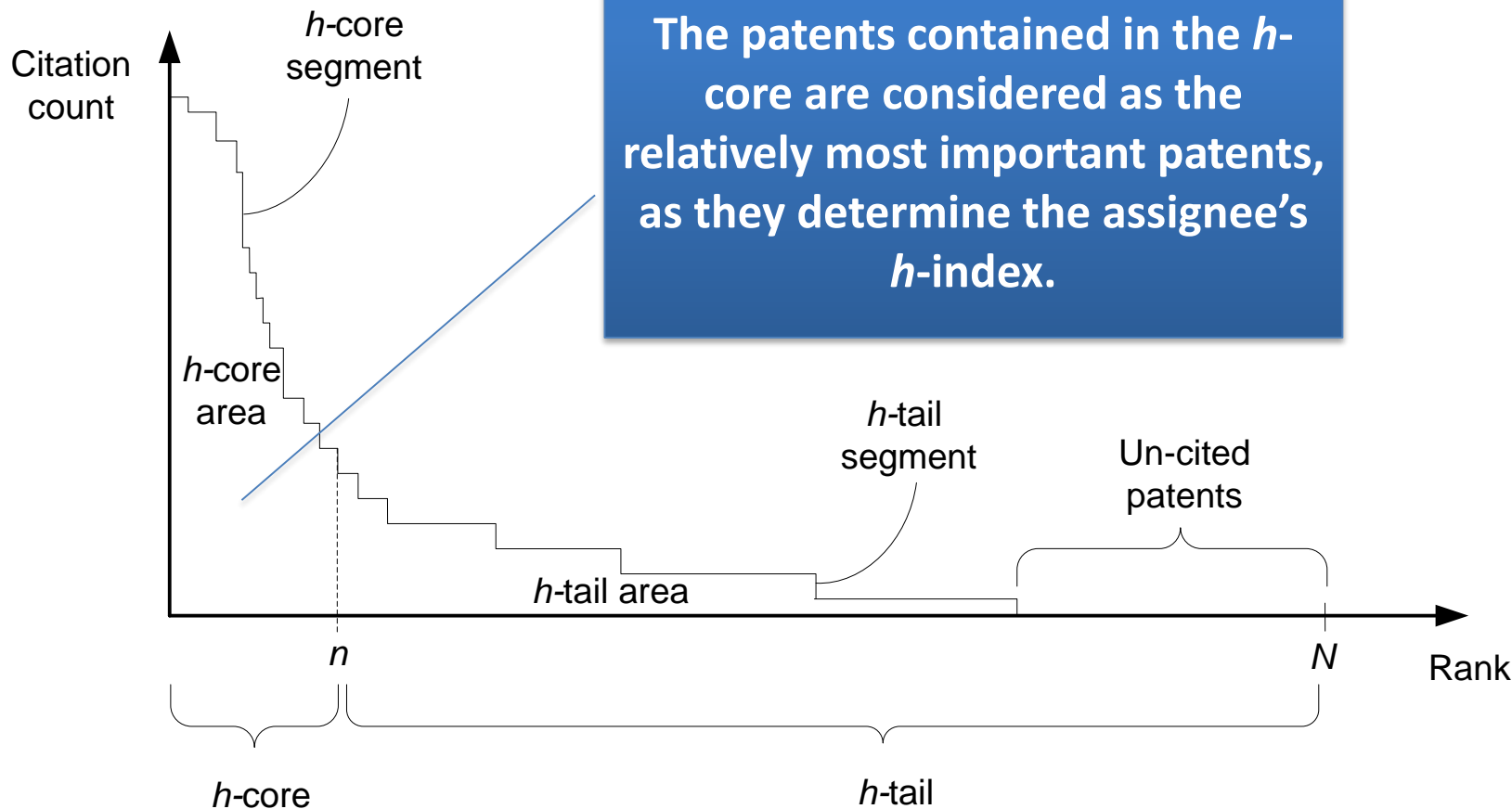- The validity of a patent and the remaining life of a valid patent are ignored for simplicity's sake.

◆IEEE   www.IEEM.org

The IEEE International Conference on
Industrial Engineering and Engineering Management

10 - 13 Dec 2012,
Hong Kong Convention and Exhibition Centre, Hong Kong

Victoria Habour, Hong Kong

Methodology

Citation count

h-Index is n if there are n patents having citations >= n and the rest of the patents having <= n citations.

A patent assignee have a portfolio of N patents $\{P_1, P_2,..., P_{N-1}, P_N\}$ sorted in descending order of their respective citation counts $C(P_i)$, $1 \leq i \leq N$. The assignee's **rank-citation curve** is obtained by plotting and connecting the points $(i, C(P_i))$.

n

n

N

Rank

◆IEEE   www.IEEM.org

The IEEE International Conference on
Industrial Engineering and Engineering Management

10 - 13 Dec 2012,
Hong Kong Convention and Exhibition Centre, Hong Kong

Victoria Habour, Hong Kong

The patents contained in the *h*-core are considered as the relatively most important patents, as they determine the assignee's *h*-index.

Citation count

h-core segment

h-core area

h-tail segment

Un-cited patents

h-tail area

n

N

Rank

h-core

h-tail

◆IEEE

www.IEEM.org

The IEEE International Conference on
Industrial Engineering and Engineering Management

10 - 13 Dec 2012,
Hong Kong Convention and Exhibition Centre, Hong Kong

Victoria Habour, Hong Kong

Further Assumptions

- We use a patent assignee's *h*-core to represent its IP performance.

- However, the *h*-index does not give us the full story.

  – Greater *h*-index does not guarantee greater accumulation of citations.
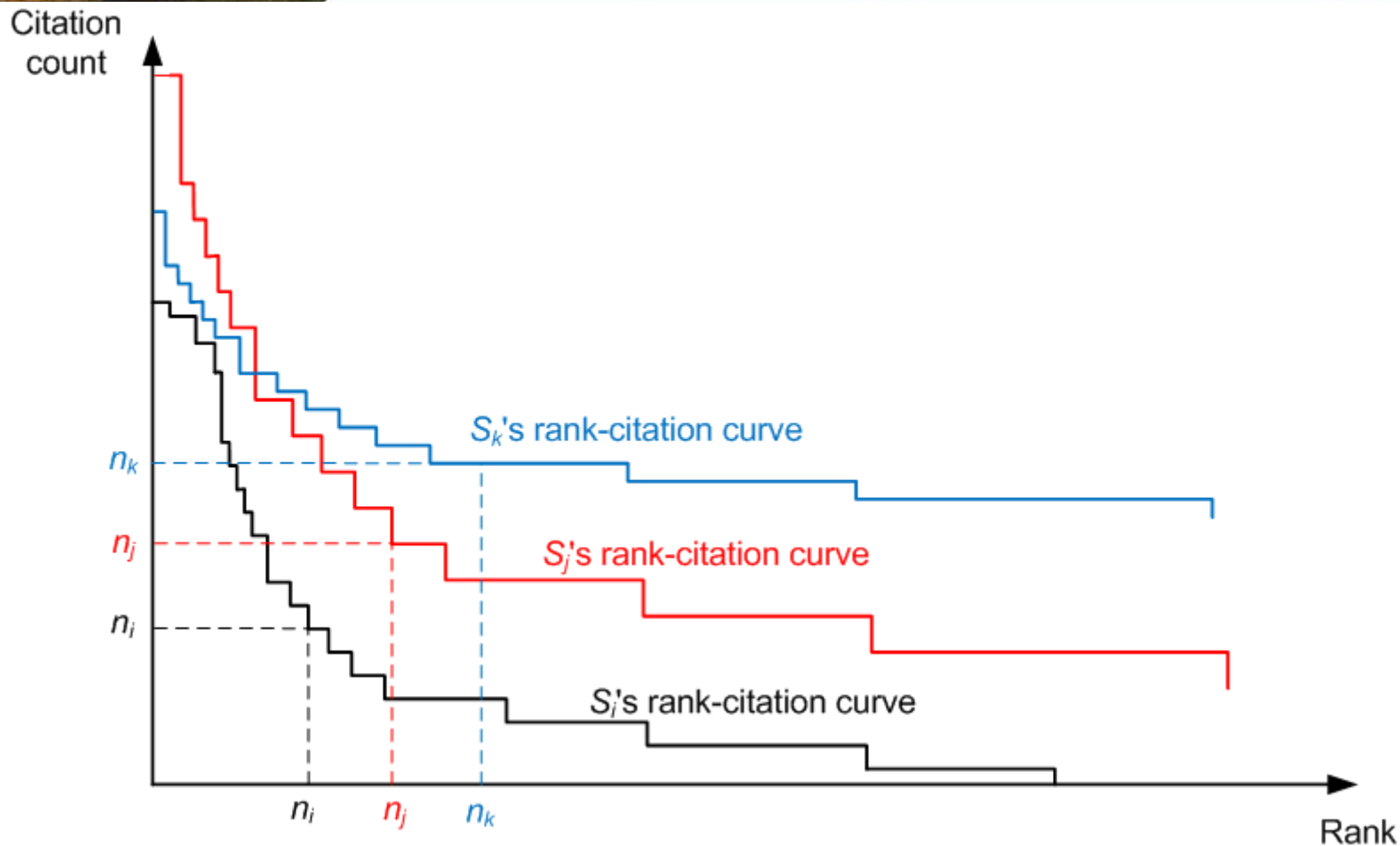
- We need something more.

◆IEEE

www.IEEM.org

The IEEE International Conference on
Industrial Engineering and Engineering Management

10 - 13 Dec 2012,
Hong Kong Convention and Exhibition Centre, Hong Kong

Victoria Habour, Hong Kong

- SPONSORS & CO-ORGANIZERS -

◆IEEE

NUS
National University
of Singapore

NANYANG
TECHNOLOGICAL
UNIVERSITY

香港科技大學
THE HONG KONG
UNIVERSITY OF SCIENCE
AND TECHNOLOGY

香港城市大學
City University
of Hong Kong

◈IEEE   www.IEEM.org

The IEEE International Conference on
Industrial Engineering and Engineering Management

10 - 13 Dec 2012,
Hong Kong Convention and Exhibition Centre, Hong Kong

Victoria Habour, Hong Kong

$$c\text{ - descriptor} = \sum_{i=1}^{n} C(P_i)\left(\frac{C(P_i)}{A_c}\right) = \frac{\sum_{i=1}^{n} C(P_i)^2}{\sum_{i=1}^{n} C(P_i)}.$$

$$Core\,Value = h\text{ - index} \cdot c\text{ - descriptor} = n \cdot \frac{\sum_{i=1}^{n} C(P_i)^2}{\sum_{i=1}^{n} C(P_i)}.$$

◈IEEE

www.IEEM.org

The IEEE International Conference on
Industrial Engineering and Engineering Management

10 - 13 Dec 2012,
Hong Kong Convention and Exhibition Centre, Hong Kong

Victoria Habour, Hong Kong

Empirical Data

- The proposed approach is applied to the 100 assignees having the greatest numbers of U.S. patents granted in the year 2009

- These assignees' U.S. patents issued between 1976 and 2009 are collected.

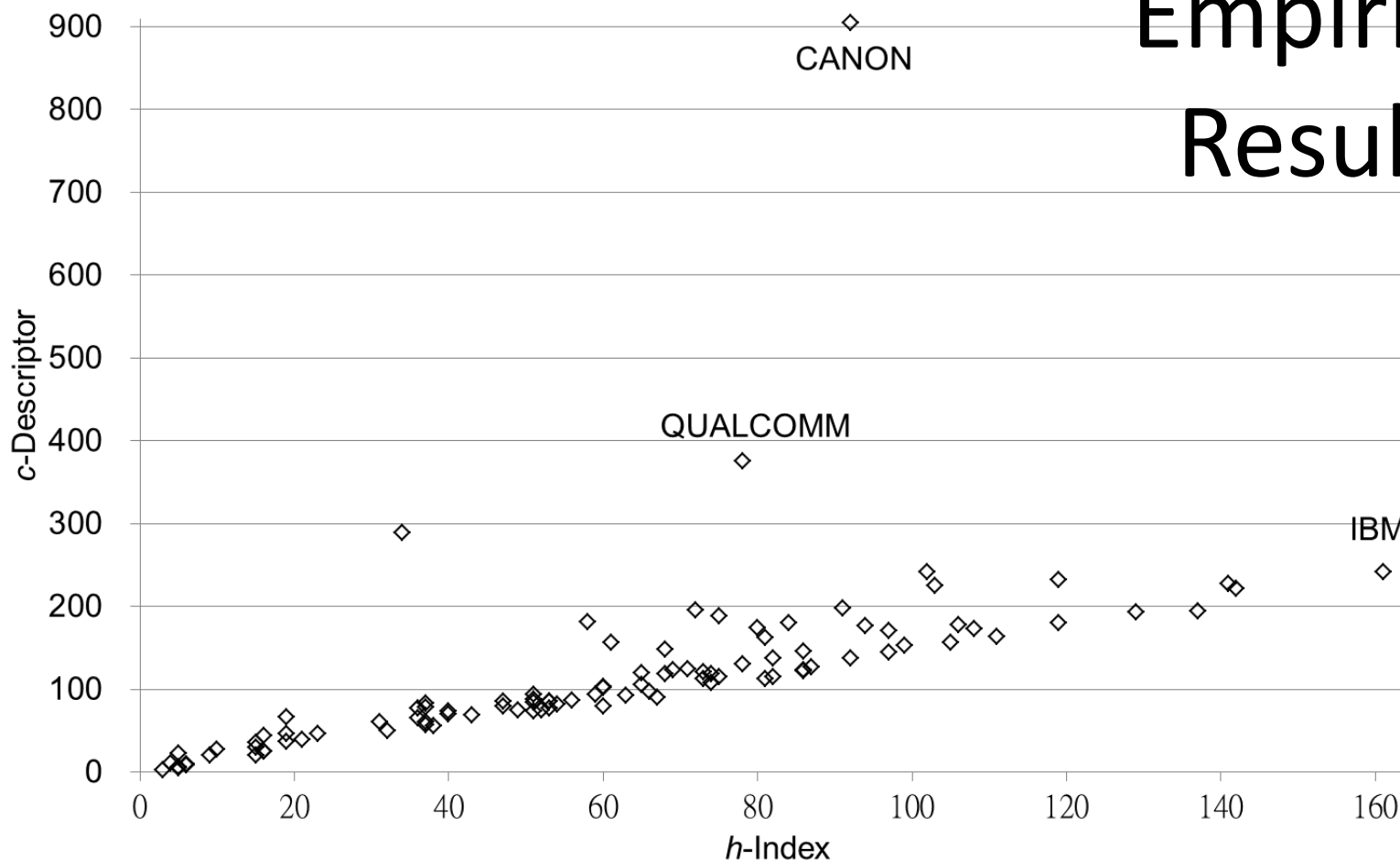- This is not an ideal set of data but is used for illustration purpose.

- SPONSORS & CO-ORGANIZERS -

◈IEEE   IIE   NUS National University of Singapore   NANYANG TECHNOLOGICAL UNIVERSITY   香港科技大學 THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY   香港城市大學 City University of Hong Kong

www.IEEM.org

The IEEE International Conference on
Industrial Engineering and Engineering Management

10 - 13 Dec 2012,
Hong Kong Convention and Exhibition Centre, Hong Kong

Victoria Habour, Hong Kong

Assignee	Rank by Core Value	Core Value	Rank by h-Index	h-Index	A_c
CANON	1	83,260	18	92	22,371
IBM	2	38,962	1	161	35,636
TEXAS INSTRUMENTS	3	32,148	3	141	29,274
AT&T CORP.	4	31,524	2	142	27,957
QUALCOMM	5	29,328	31	78	13,874
XEROX	6	27,608	6	119	22,526
MICRON	7	26,578	4	137	25,135
MOTOROLA	8	24,897	5	129	22,597
SEMICON. ENERGY LAB.	9	24,684	13	102	19,148
MEDTRONIC	10	23,175	12	103	17,861

- SPONSORS & CO-ORGANIZERS -

IEEE   IIE   NUS National University of Singapore   NANYANG TECHNOLOGICAL UNIVERSITY   香港科技大學 THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY   香港城市大學 City University of Hong Kong

◆IEEE

www.IEEM.org

The IEEE International Conference on
Industrial Engineering and Engineering Management

10 - 13 Dec 2012,
Hong Kong Convention and Exhibition Centre, Hong Kong

Victoria Habour, Hong Kong

Summary

- We proposed a new index called *Core Value* to characterize a patent assignee's *h*-core performance in terms of both quantity and quality.

- The *c*-descriptor and Core Value can be easily obtained as by-products when determining the assignee's *h*-index.

Thank You