To Infinity and Beyond!

Do we pass 3DTV, HBB, and UHDTV on the way?

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Progress was OK, it’s just gone on too long!

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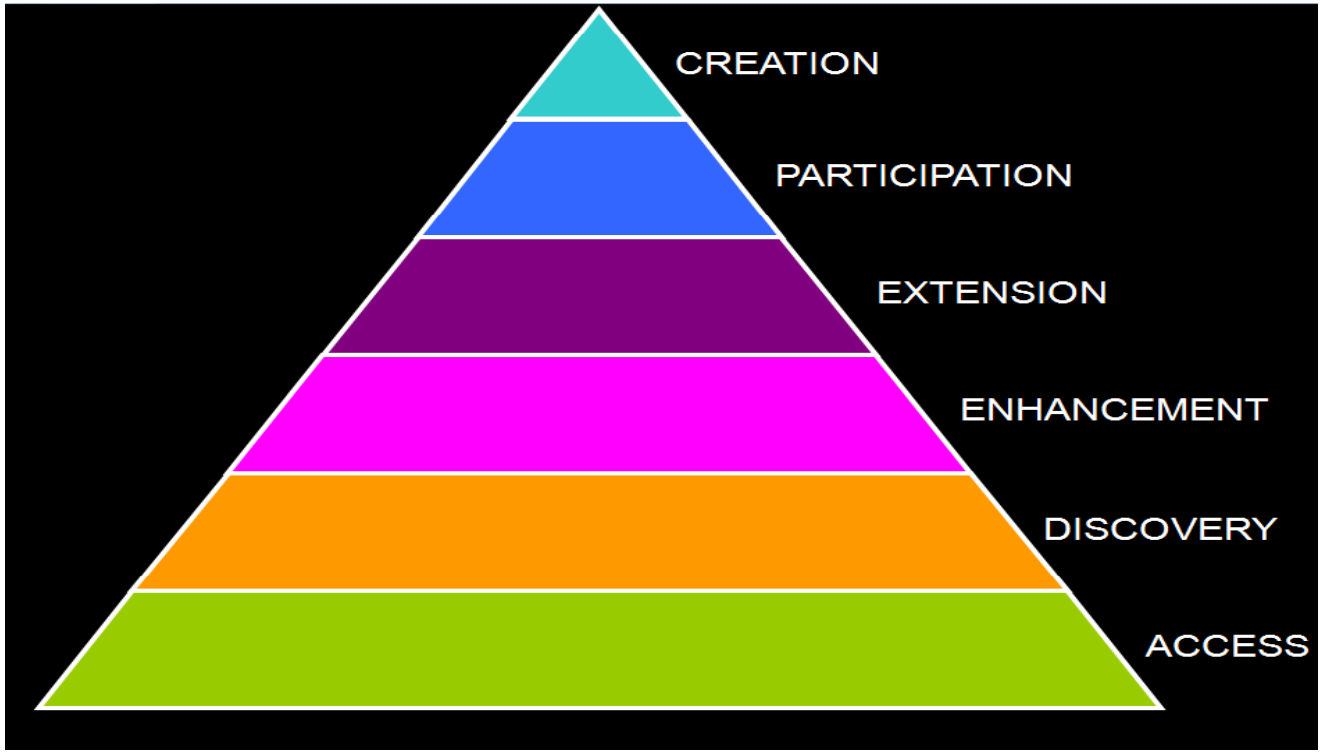
Which sources are the most reliable?

- Hunches?
- Miscellaneous Facts?
- Science?
- Fox News?

The Julie Andrews trajectory....climb every mountain? (the John Ousby hypothesis)



What shapes the direction of the new media?

(DW IGF hypothesis)

- The forces of the **market economy** e.g. profit seeking, industry consolidation.
- The national **regulatory environment**.
- **Technology evolution** e.g. Moore's law results.
- The ingenuity of the **content** that can be provided .

Just gimme the facts, mam.

- Currently people ‘upgrade’ their TV set on average about every 7-8 years.
- The ‘cash’ spent on a TV set remains roughly constant.
- There is not a great correlation between the ‘state of the economy’ and TV set purchase.
- People usually upgrade the screen size by less than 10” each time.
- Panel prices for a given size fall each year.
- Sales increase in peaks when there are major sporting events.

One of the best , but not perfect, ways around to predict....

- Look for ‘cyclic’ patterns over time.
- A cyclic pattern does not stop abruptly without some major disruption.
- LOOK FOR THE PATTERN

The phases and cycles of new media

- The **ideas** phase, then
- The **research and development** phase, then
- (the **arguing about standards** phase), then
- The **implementation** phase
- The phases of two cycles may overlap each other.
- The cycles can ‘trip over’ each other.

There are (i.a) two ‘cycles’ to consider

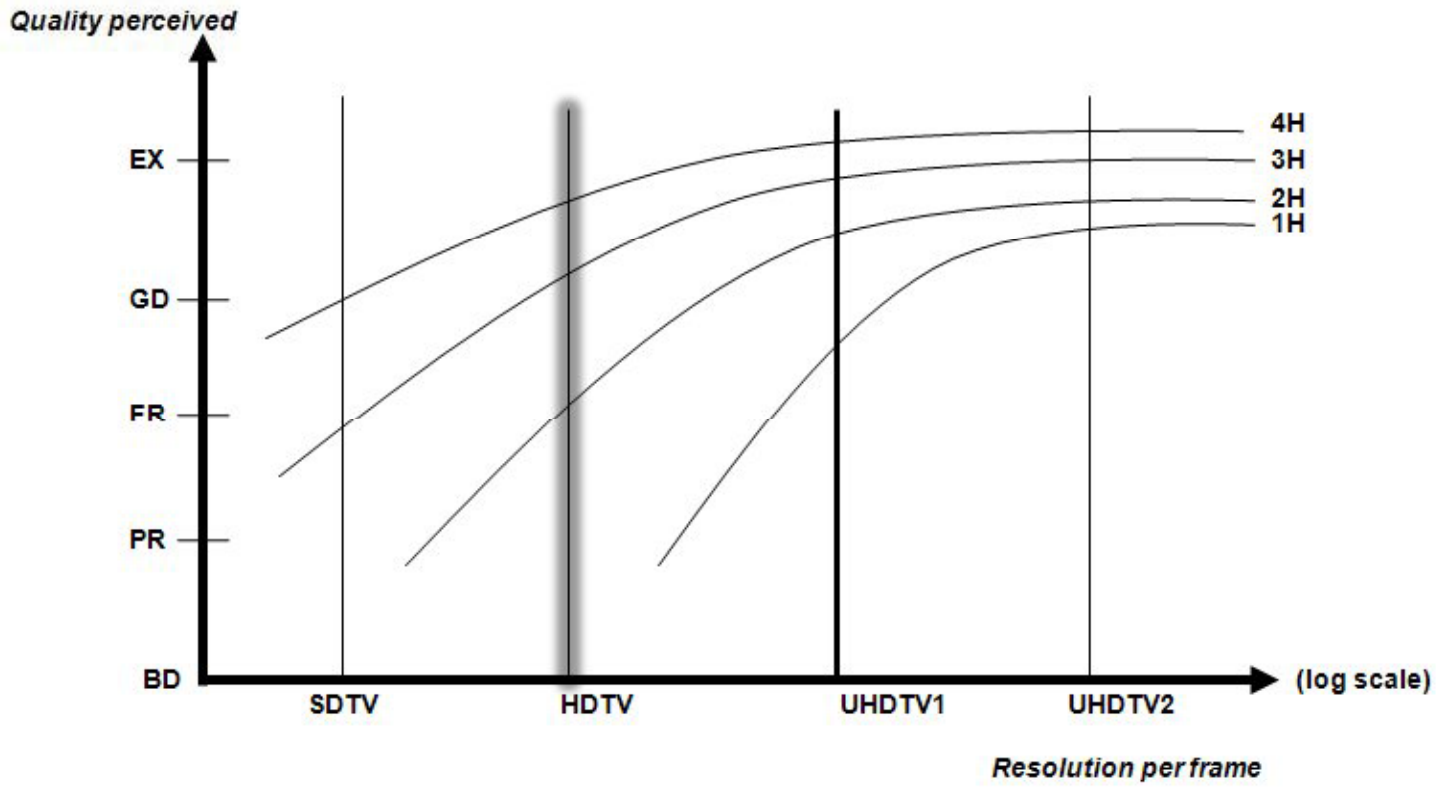
- The cycles that occur within a given economic area of technology development
- The cycles that occur internationally because of industrial rivalry and different states of advancement. As time goes on more and more countries and companies have the will and capacity to develop their own standards. More cycles to overlap.

The international cycles of new digital media

- The **regions and countries** that have the capacity to develop new media systems (US, Europe, China, Korea, Japan) develop them at different times.
- **One country**/region develops a system.
- **Another country**/region needs the system later, and ‘improves’ on the earlier system.
- **The pattern repeats itself**.
- The countries that do not develop new media systems have problems in choosing.

So, what about HDTV and its successors?

What happens to quality?



The planar TV quality steps

- HDTV 1.0: analogue HDTV
- **HDTV 2.0: digital HDTV (1080i/720p, MPEG2)**
- **HDTV 2.1: digital HDTV (1080i/720p, AVC)**
- HDTV 3.0: digital HDTV (1080p50, 60 AVC/HVC)?
- HDTV 4.0: digital UHDTV1 (8Mp, HVC)
- HDTV 5.0: digital UHDTV2 (32Mp, HVC+)
- Each generation lasts about ten years?

What about 3D?

3D Levels and Profiles

Conventional HD Service Compatible (CSC) **Level 3**	**2D compatible 2D HD + delta AVC**	2D compatible 2D HD + depth, occlusion data AVC	
Conventional HD Frame Compatible (CFC) **Level 2**	**Frame compat. AVC (2x1080i/960)**		
Conventional HD Display Compatible (CDC) **Level 1**	colour anaglyph + Pulfricht AVC +MPEG2		
	Plano-Stereoscopic Profile **1st Gen 3DTV**	Multiview Profile **2nd Gen 3DTV**	Object Wave Profile **3rd Gen 3DTV**

The Generations of 3D TV

- Generation 1: **Plano-stereoscopic (one L, R)**
- Generation 2: multiview (multiple L, R)
- Generation 3: holoscopic or integral (multiple L, R, H)
- Generation 4: Object wave recording.
- Each generation may have a cycle time of 10-15 years?

Within the First S3D Generation

- ITU Level 1 No new equipment
- ITU Level 2 No new set top box, new display
- ITU Level 3 New set top box, new display.

For ITU Level 3 Bear in mind....

- The more horizontal detail in the L and R pictures, the more resolution in the z plane.
- The quality gain from half HDTV to full HDTV is greater than the 1080i to 1080p gain – resolution benefit is an inverse square law.
- Spectrum scarcity for DTT may call for a embedded solution for 3DTV
- It may be enough for Level 3 to succeed.

What about Hybrid Broadcasting?

Internet TV

- Teletext (successful in many countries) provides text.
- Interactive TV (successful in fewer countries) provides multimedia and some interactivity.
- HBB provides cooperative content with large web resource. Major opportunities for content synergies.
- **Major handicap: explosion of ‘standards’.**

Conclusions

- the quality jump to 1080p/50, 60 for delivery is relatively modest, and may not sustain a new service.
- It is likely that vision systems will move forward from 1-2Mp in two steps: 8Mp and 32Mp.
- 3D TV may follow the same pattern 1-2Mp, 8Mp, 32Mp with a time shift.
- A level 3 3DTV may have enough to be successful.
- Plenty of work for Leonardo’s band for many years.
- Hybrid broadcasting is difficult to predict.

Conclusions

- One of our most powerful tools for predicting the future of broadcasting is to ‘continue’ cycles into the future.
- It would be illogical if the cycles just stopped. They will continue, but they may be disrupted or derailed by standards fragmentation, and this may be an increasing problem.
- Will we be able to compromise with others on standards, or are we doomed to make success more and more difficult, and our future more unpredictable? “Our fate is not in our stars but in ourselves”.

Please remember:

We can ‘predict’ the trends and tendencies of the future of broadcasting.

But not the detail.

Thank you for listening

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