

**Trends in Graphics Architecture**

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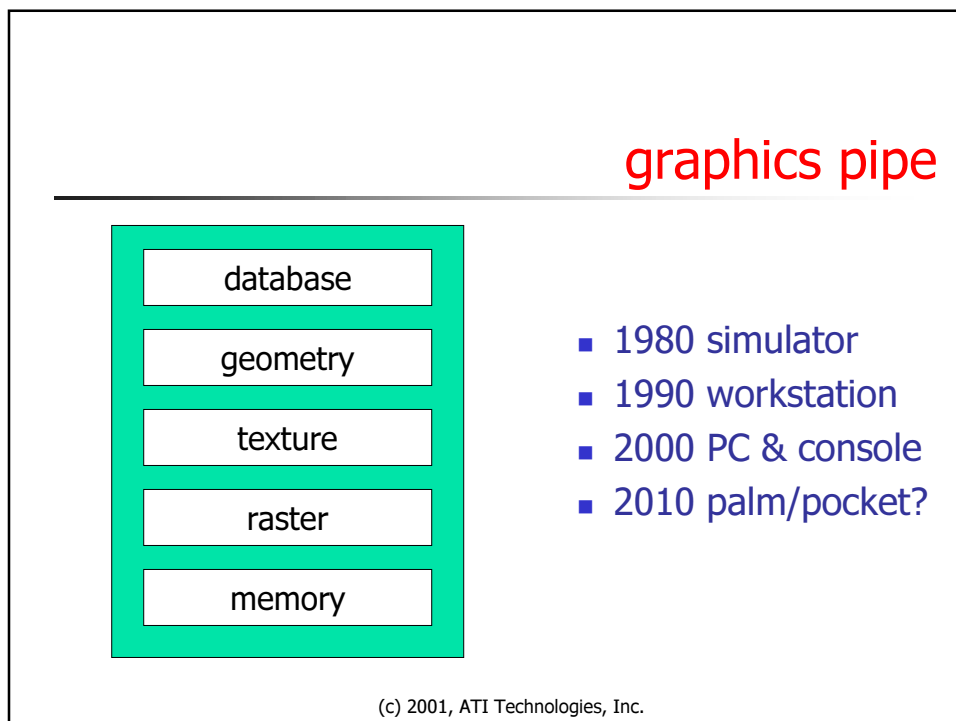
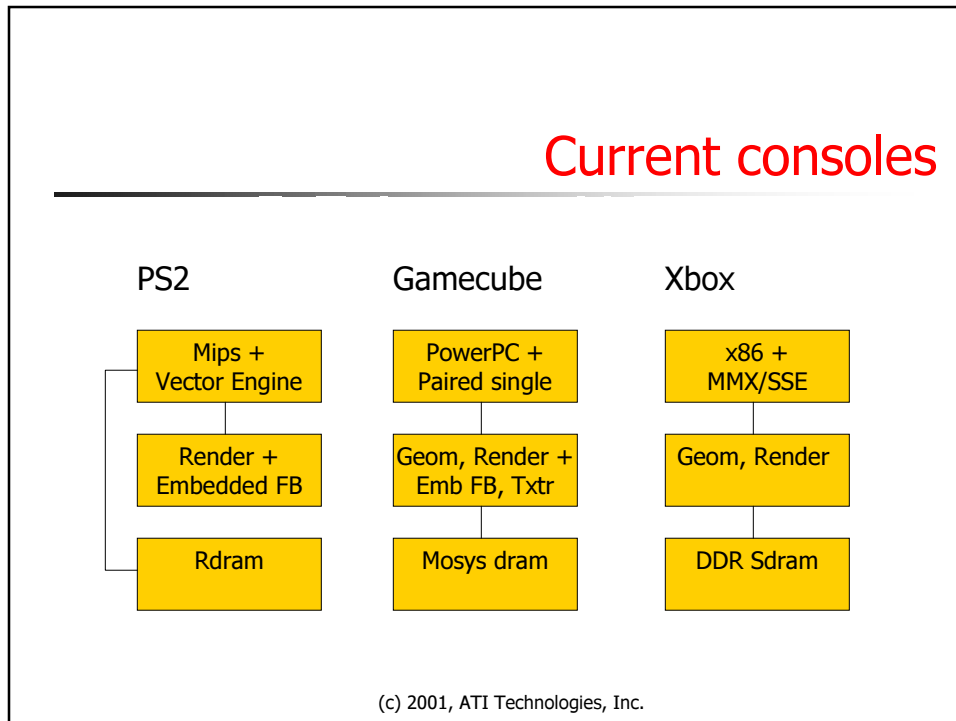
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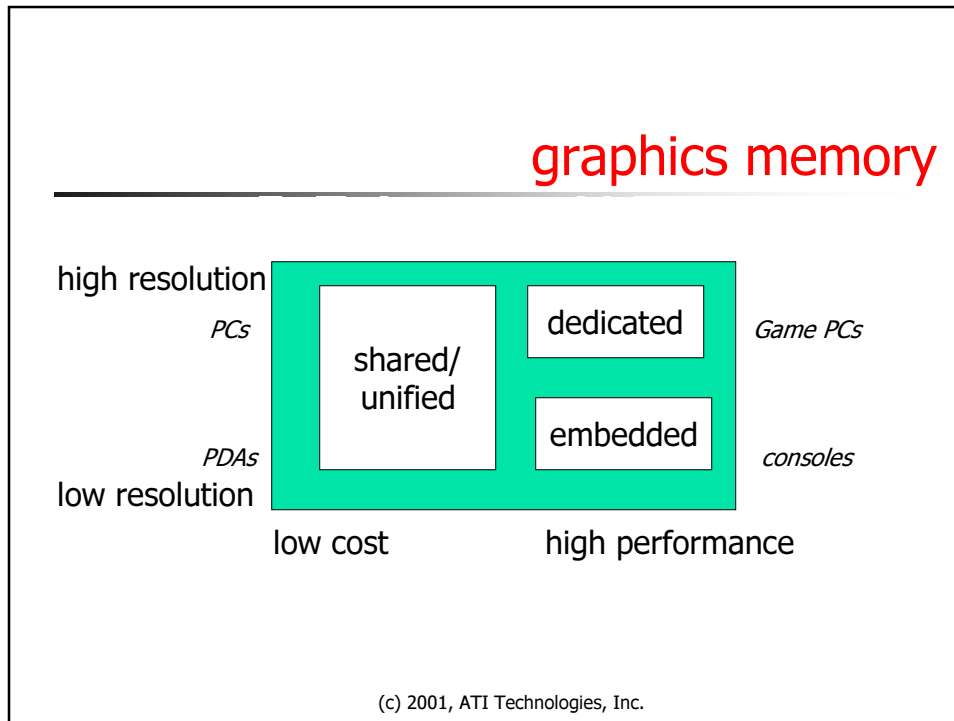
**graphics business**

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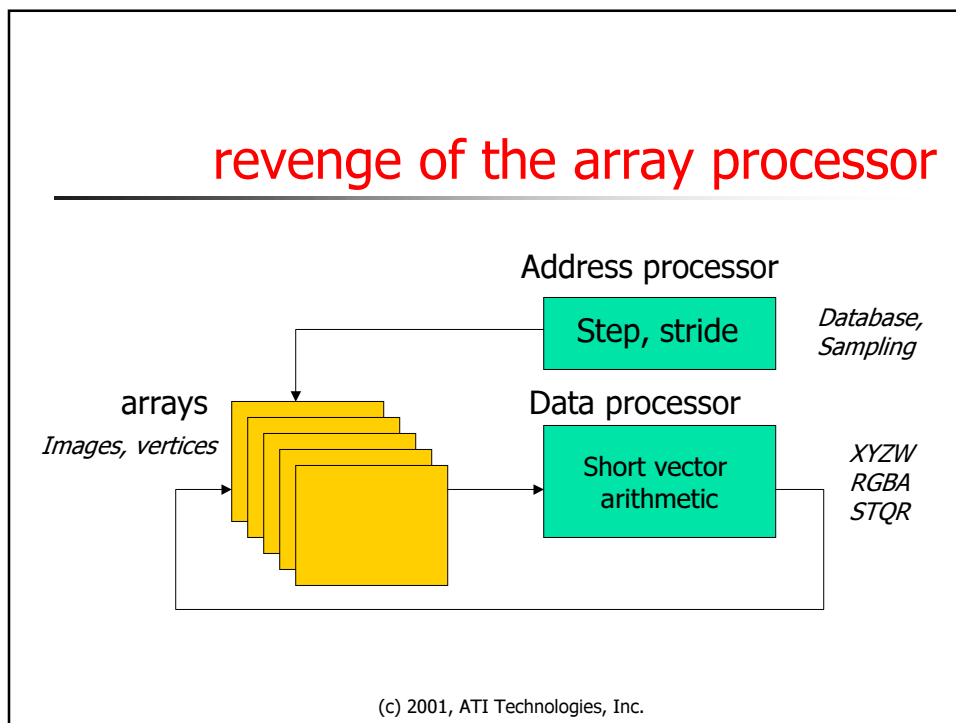
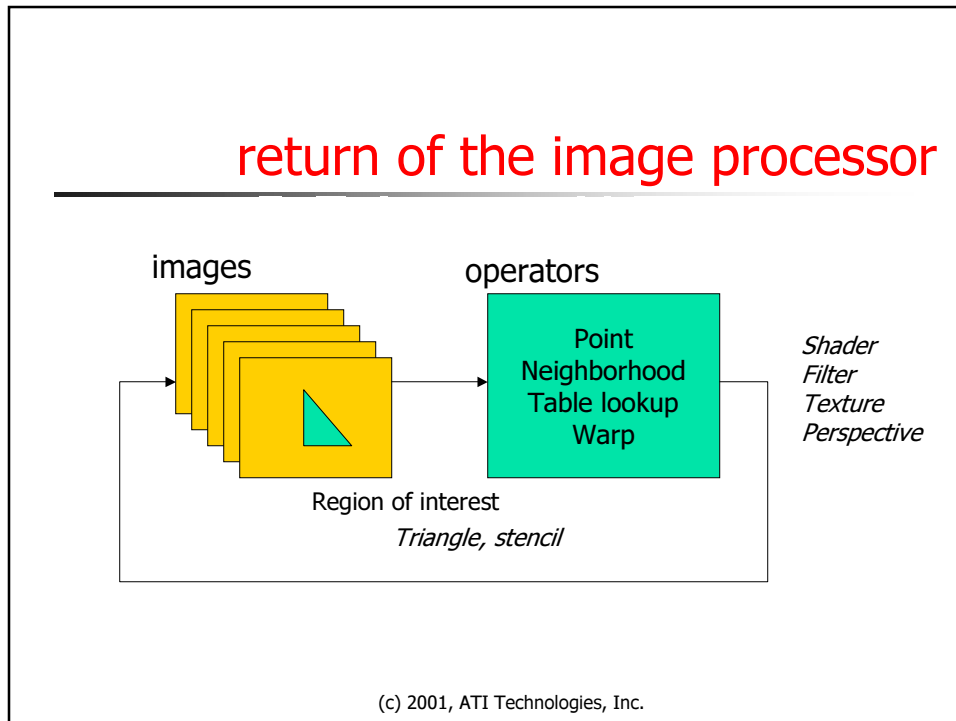
- ~\$20M to develop a graphics chip
- Lucky to net ~\$10 a chip
- Only game platforms have enough volume
  - Novelty supercedes fidelity
- PC's offer many design win opportunities
  - But model and API velocity limit lifecycle
- Consoles live long and prosper
  - But only 2.5 design wins per cycle

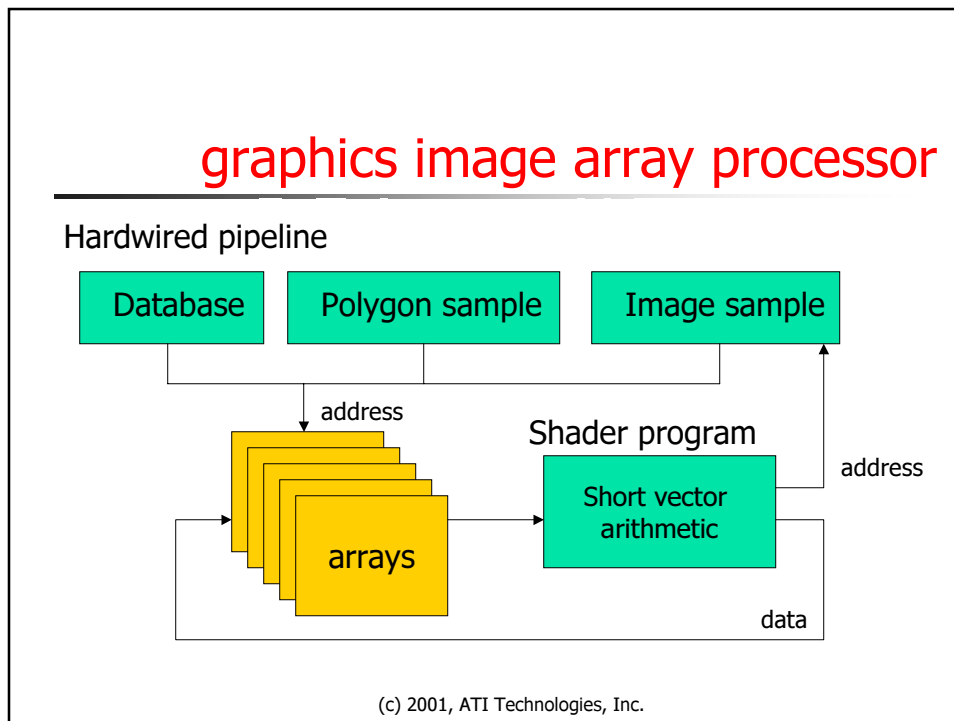
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- ## graphics programmability
- CPU
    - Less than compelling 3D
  - 80's bitslice, DSP, sundry
    - Lag in clock speed, software
  - 90's CPU plus simd coprocessor
    - Lag in memory throughput, addressing
  - 00's standalone simd coprocessor ('shader')
    - TBD
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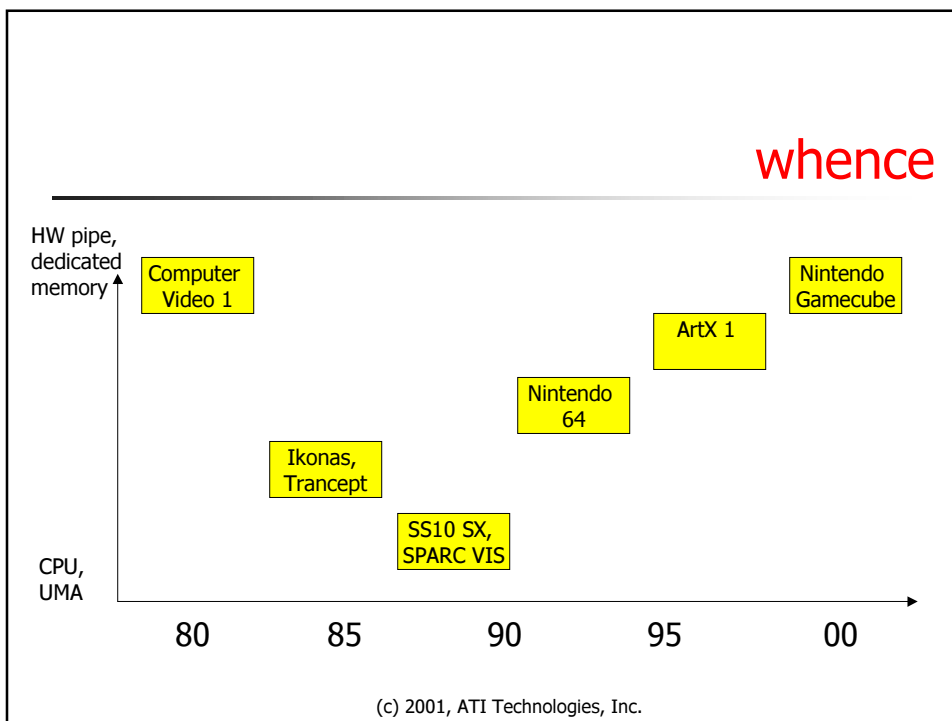
- ## whither
- Generalization is likely
    - Addressing, branching, threading, virtual memory
  - Cheap fast things devour big complex ones
    - Unit growth in pocket/palm entertainment
  - But programmability can be scalable
    - Perhaps SOC CPU + simd + database/samplers
  - And business overpowers technologies
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## denial

- Global illumination is very useful
  - Simply enable shadows, reflection, refraction
- Global illumination is very hard
  - Sort violates the pipe
- So circulate lots of images, arrays
  - Novelty supercedes fidelity

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## whence



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why

- De-evolutionary optimization
  - Direct to icon to symbol and back
- Evolutionary light prosthesis
  - Compensation for our visual asymmetry
- An instrument
  - Enable the top of the pyramid

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