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VLSI FOR MULTIMEDIA APPLICATIONS

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Abstract:
Today there is a race to design interoperable video systems for basic digital computer functions, involving multimedia applications in areas such as media information, education, medicine and entertainment, to name but a few. Digital TV functions can be optimized for encoding and decoding and be implemented in silicon in a more dedicated way using a kind of automated custom design approach allowing enough flexibility.
This paper provides an overview of the current status in industry of digitized television including techniques used and their limitations, technological concerns and design methodologies needed to achieve the goals for highly integrated systems.
**Keywords:** *about four key words separated by commas.*

INTRODUCTION

Asynchronous design methodology has been The first "generation" of electronics relied on vaccume tubes. Then came discrete semiconductors devices, followed by integrated circuits. The first Small-Scale Integration ICs had small numbers of devices on a single chip the fourth generation consisted of Large-Scale Integration and its natural successor was VLSI (many tens of thousands of gates on a single chip). Very-large-scale integration (VLSI) of systems of transistor based circuits into integrated circuits on a single chip first occurred in the 1980s as part of the semiconductors and communication technologies that were being developed. The first semiconductor chips held one transistor each. Subsequent advances added more and more transistors, and as a consequence more individual functions or systems were integrated over time. The microprocessors are a VLSI device

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**Architecture for Digitization of T.V. Functions:**
The idea of digitization of TV functions is not new. The time some companies have started to work on it, silicon technology was not really adequate for the needed computing power so that the most effective solutions were full custom designs. This forced the block-oriented architecture where the digital functions introduced were the one to one replacement of an existing analog function. In Figure there is a simplified representation of the general concept.
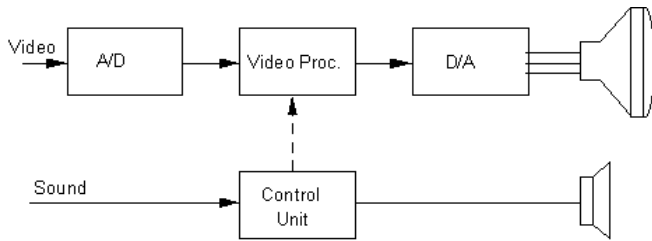
Block Diagram of first generation digital TV set

The natural separation of video and audio resulted in some incompatibilities and duplication of primary functions. The emitting principle is not changed; redundancy is a big handicap, for example the time a SECAM channel is running, the PAL functions are not in operation. New generations of digital TV systems should re-think the whole concept top down before VLSI system partitioning.

By its very nature, computer technology is digital, while consumer electronics are geared to the analog world. Starts have been made only recently to digitize TV and radio broadcasts at the transmitter end (in form of DAB, DSR, D2-MAC, NICAM etc).
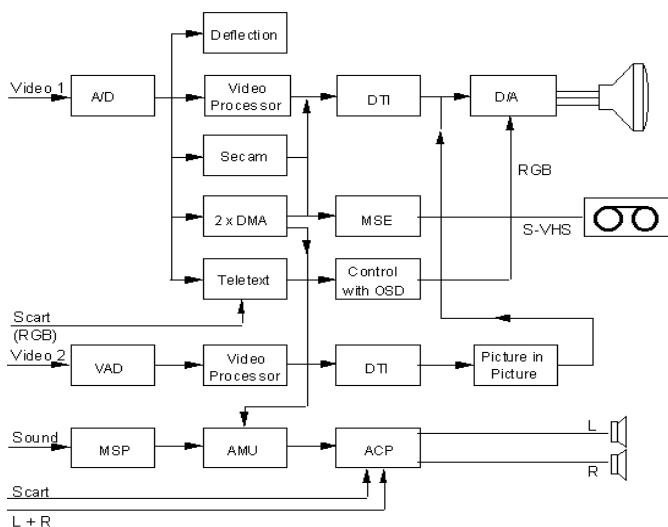
DIGIT2000 TV receiver block diagram

DIGITAL VIDEO STANDARDS

- JPEG (Joint Photographic Expert Group) for still pictures coding
- H.261 at p times 64 kbit/s was proposed by the CCITT (Consultative Committee on International Telephony and Telegraphy) for teleconferencing

- MPEG-1 (Motion Picture Expert Group) up to 1,5 Mbit/s was proposed for full motion compression on digital storage media
- MPEG-2 was proposed for digital TV compression, the bandwidth depends on the chosen level and profile [33].
- MPEG-4 for very low bit rate coding (4 kbit/s up to 64 kbit/s)

APPLICATION

- Concept to chip to Prototype system capability
- Digital designs, dense complexity designs expertise.
- Well-established Physical design knowledge to tape out complex digital designs.
- Analog & RF design experience.
- FPGA to ASIC conversion
- CPLD and FPGA based design using Altera & Xilinx.

What Is TTS?

TTS, short for Text-To-Speech, is the creation of audible speech from computer readable text. Our research group's charter is to increase the naturalness of speech synthesis significantly while maintaining good intelligibility. Example: TV Commercial Highlights AT&T Voice Technology. TTS technology can be useful whenever a computerized application needs to communicate with a customer or user, and so is especially useful in telephone services.

Advantages

- A digital system offers a number of advantages with regard to the production of TV sets:
- Digital circuits are tolerance-free and are not subject to drift or aging phenomena. These well-known properties of digital technology considerably simplify factory tuning of the sets and even permit fully automated, computer-controlled tuning.

- Digital components can be programmable. This means that the level of user convenience and the features offered by the set can be tailored to the manufacturer's individual requirements via the software.
- A digital system is inherently modular with standard circuit architecture. All the chips in a given system are compatible with each other so that TV models of various specifications, from the low-cost basic model to the multi-standard satellite receiver, can be built with a host of additional quality and performance features.

Modular construction means that set assembly can be fully automated as well. Together with automatic tuning, the production process can be greatly simplified and accelerated.

Future Scope

The India's fastest-growing electronics design company driven by a vision to provide the most valued state of-the-art technology solutions is VLSI India Pvt. Ltd. They are working with high quality VLSI design and System Development Services as the core focus. They have expertise in End-to-End IP solutions, integration of existing IP into systems with rapid time-to-market requirements, reusable ASICs designed with the latest process technology and rapid conversion of IP to Silicon.VLSI India Pvt. Ltd. prides itself on hiring and retaining a workforce that is entrepreneurial, creative, pragmatic and eager to find new ways to turn our Client's vision into reality.

System Prototyping:

- Expertise in bringing up new chips.
- Hardware design: PCB design, analysis, Layout, manufacture interface.
- Test plan creation.

References

Number citations consecutively in square brackets [1]. The sentence punctuation follows the brackets [2]. Multiple references [2], [3] are each numbered with separate brackets [1]–[3]. Please note that the references at the end of this document are in the preferred referencing style. Please ensure that the provided references are complete with all the details and also cited inside the manuscript (example: page numbers, year of publication, publisher's name etc.).

CONCLUSION

Digitalization of the fundamental TV functions is of great interest since more than 10 years. Several million of TV sets have been produced containing digital systems. However, the real and full digital system is for the future. A lot of work is done in this field today, the considerations are more technical than economical which is a normal situation for an emerging technology. The success of this new multimedia technology will be given by the applications running with these techniques. The needed technologies and methodologies were discussed to emphasize the main parameters influencing the design of VLSI chips for Digital TV Applications like parallelization, electrical constraints, power management, scalability and so on.

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