

**İSTANBUL TEKNİK ÜNİVERSİTESİ
ELEKTRİK-ELEKTRONİK FAKÜLTESİ**

**EBEVEYN EĞİTİM SİSTEMİ
(PARE.Net)**

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I.ÖZGÜNLÜK BİLDİRİSİ

Özgünlük Bildirisi

1. Bu çalışmada, başka kaynaklardan yapılan tüm alıntılar, ilgili kaynaklar referans gösterilerek açıkça belirtildiğini,
2. Alıntılar dışındaki bölümlerin, özellikle projenin ana konusunu oluşturan teorik çalışmaların ve yazılım/donanımın benim tarafımdan yapıldığını bildiririm.

İstanbul, 25.05.2007

Erman ORAL

II EBEVEYN EĞİTİMİ SİSTEMİ (ÖZET)

Eğitim sorunları insanlığın çözmesi gereken öncelikli sorunlar olarak karşımıza çıkmaktadır. Ebeveynlerin de bebeklerini büyütürken ve yetiştirirken karşılaştıkları ciddi sorunları vardır. Özellikle yeni ebeveynlerin bu konudaki bilgi ve tecrübe eksiklikleri, bebeklerinin problemlerini çözmelerinde, onları anlayabilmelerinde, doğru davranışta bulunmalarında sıkıntılar yaratmaktadır. Sistem son teknolojileri en etkin biçimde kullanarak ebeveynlerin bu sorunlarını çözmeyi amaçlamaktadır. En büyük sorunlardan biri de bebeklerin neden ağladığı, probleminin ne olduğu sorunudur. Yapılan son araştırmalar dünya üzerindeki bebeklerin ortak sorunları için ortak davranışlarda bulduklarını ve ortak sesler çıkardığını göstermektedir. Sistem de bu araştırmanın sonuçlarını kullanarak, bebeklerin seslerini algılamakta ve aileye bebeğin ağlamasının olası nedenlerini sunmaktadır. Bu şekilde aile daha da bilinçlenmektedir. Ayrıca sesler sabit olmayıp, sürekli değişebilmekte aileler de bu sürece katılabilmektedirler. Kendi keşfettikleri sesleri sisteme yükleyebilmekte ve bu sesler daha sonraki analizlerde kullanılabilir. Ses algılama fonksiyonu dışında, sistem asıl olarak aileyi bir eğitim döngüsü içine sokmaktadır. Bu farklı eğitimsel metodlarla gerçekleştirilmekte, soyut bilgiler somutlaştırılıp, ailelerin kullanımına sunulmaktadır. Ailelerin eğitimi arama, analiz, takip, katılım, iletişim yöntemleri ile sağlanmaktadır. Aile bebeği ile ilgili karşılaştığı sorunlarla ilgili sistemde arama yapıp olası çözümleri görebilmektedir. Sistem üzerine oturduğu verilerle ilgili ailelere karşılaştırmalı analizler sunabilmektedir. Bu başlı başına bir araştırma sonuç kaynağı olup aynı zamanda karşılaştırmalı metodlarla ailelerin eğitimine katkıda bulunmaktadır. Bebeklerin daha önce yaşadığı sorunlar ve ailelerin bu sorunlara karşı kullandıkları çözümler de sistemde kaydedilmektedir. Bu sayede aile bebeğinin geçmiş sorunlarını ve kendi kullandığı çözümleri takip edebilmektedir. Aileler sisteme katılabilmekte, kendi çözümlerini sistemem ekleyebilmekte, varolan çözümlere geri-besleme yapabilmektedirler. Bu da karşımıza sürekli genişleyen ve yenilenen dinamik bir sistem çıkarmaktadır. Ayrıca aileler sistemdeki diğer ailelere ve danışmanlara etkin iletişim kanalları ile bağlanmaktadır. Bütün bunlar çoklu dil desteği ile kapsanıp, projeye küresel bir anlam katılmakta ve eğitimin önündeki en büyük engellerden biri olan dil sorunu ortadan kaldırılmaktadır. Bu yöntemler kullanılarak ebeveynler bilinçlendirilmekte ve eğitilmektedirler.

III

PARENT EDUCATION SYSTEM

PARE.NeT

(SUMMARY)

Project Inspirations

Imagine a world that the babies, our future, are much happy and the parents take a good education about their babies thanks to the technology... Babies are crying whether because they can not tell parents their needs or parents can not guess babies needs and parents do not experienced enough about baby care. PARE.NeT was created to solve parent's educational problems. It educates and orientations parents through accredited information and experiences. Besides, it improves explicit relationship between babies and their parents by turning baby language into explicit languages.

Project Overview

In the world, each person encounters the problems about the issue of communication and sharing after they have became parents. While research shows that babies use common language until they begin to speak, in this project, the use of this language effectively is provided thanks to the technology. What is more, it is found a solution to the communication problem between parents and baby. This system conveys the needs and the meanings of baby to the parents by analyzing the baby's voice. Also, within the project, information cycle platform that is dynamic and suitable is presented for the parents. This platform is formed to educate, orient the parents and make them conscious.

In both parts, these new approaches will offer a innovative tool to communicate, create, disseminate, store and manage information through main values of education which are common all over the world and has not been changed during many ages.

Project Background

Self created Web service

Designed on .NET Framework 3.0 , .NET Compact Framework 2.0

Mobile device

Visual Studio 2005 used for developing

SQL Server 2005

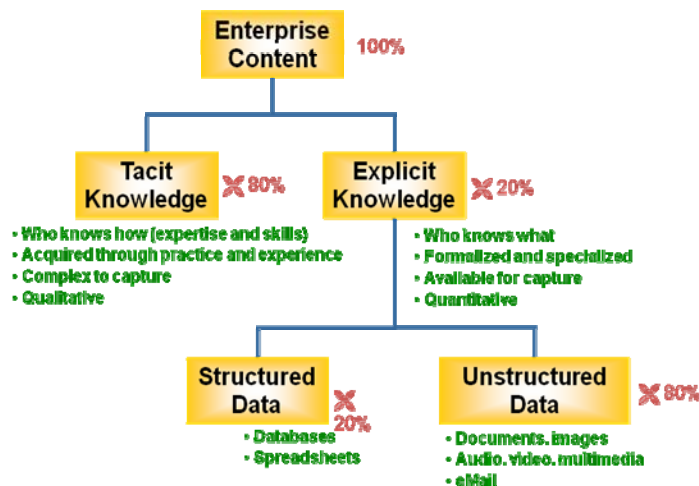
Education

Since the beginning of humanity, education concerns about people whole their lives.



Education based on three main value. These are information&knowledge, communication and sharing. These three main values has not been changed since the beginning of humanity.

Nowadays, technology is an increasingly influential factor in education. Computers and mobile devices are being widely used to both complement established education practices and develop new ways of learning. Technology offers powerful learning tools that demand new skills and understandings.



Knowledge Conversion, Nonaka, Takeuchi(1995)

Global Education Problems



It is aimed to find different solutions to the problems of communication and sharing basically about the education by using technology in order to optimize the education in the world. To make abstract and tangible information shared and the linguistic problem encountered in communication are the basic problems that should be dealt with.

A problem in any of these two concepts affect education and education system directly all over the world.

Parents Educational Problems

In the world, each person encounters the problems about the issue of communication and sharing after they have became parents. Linguistic and Lack of Experience & Information are two main educational problems, based on global education problems.

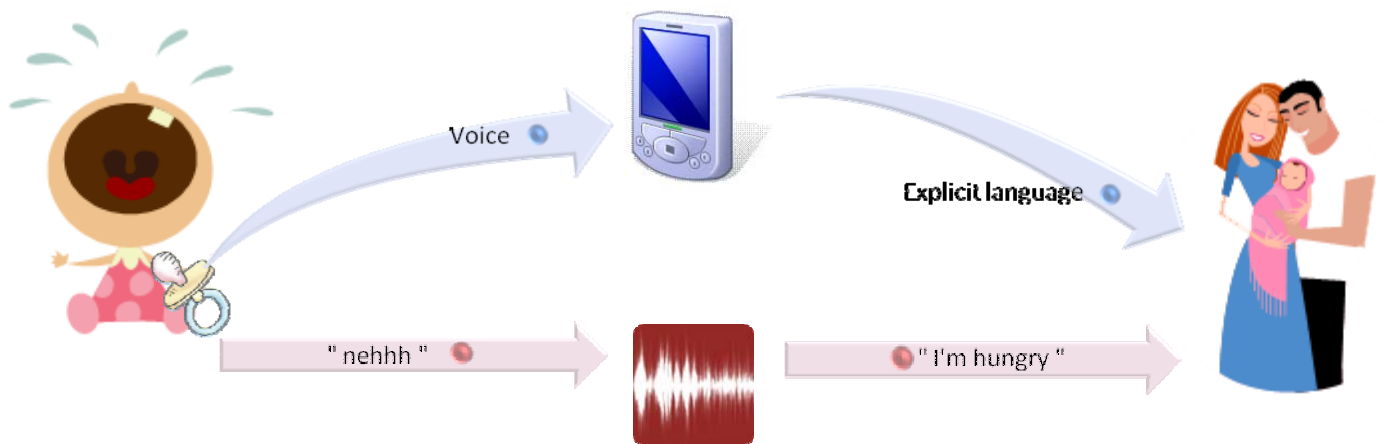
While research shows that babies use common language until they begin to speak.

However, parents are unconscious of this language so parents don't understand what their babies needs. Parents don't have enough experience about baby care and they made same mistakes. Moreover, they can't acquire explicit and urgent information that they need easily.

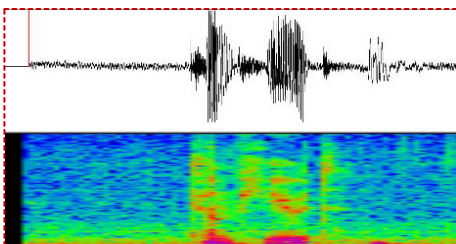
Linguistic

Out of Box

Research shows that babies are speaking common language all over the world. However, many parents are unconscious of this baby language and they can not understand their babies needs exactly. Basically, PARE.NeT receives babies voice and translates it into intelligible format.



Details



PARE.NeT gets baby voice into digitized form.

Searching and we were able to determine that the waveform needs to be transformed into a form that is suitable to determine speech. The common practice is to use a Fourier Transform and create a spectrogram.

By feeding the fourier transform an array of data form the WAV, then it would return an array of transformed data. While the waveform was a linear pattern, the result of concatenating all the fourier transforms was a 2D matrix. Each point in the matrix represents the degree of a frequency occurring in the sound at that time. To create the bitmap to view the spectrogram, that data have to be normalized and plotted. It is needed to generate what is called a 'voice print' for that particular sound. In this case, matrix sums of the spectrogram was done. The spectrogram is broken up into row and column quadrants. Then all the frequencies are summed in that quadrant to come up with an average. For the entire spectrogram, this would result in an array of averaged frequency

values. Also this used for training. So that if the same voice was recorded 3 times, then it would generate 3 different prints, and then generate a master 'template' averaging all those results. That template would then be used later to compare against. It was stepped through the array and computed the difference between the incoming value and the expected value. Then, the stored template that had the lowest difference would be matched as the voice that was recorded.

Lack of Experience & Information

Out of Box

Parents have problems about their babies care. Mostly, they don't have enough experience or can't access explicit and urgent information that they need. PARE.NeT have simple user friendly, intuitive, ergonomic interface and returns utilizable information through educating. Moreover, it collects new information and experience day by day from environment by checking real cases and takes feedback.



Details

PARE.NeT is based on object oriented concept which enables break the whole part into smaller modules and chunks by referencing real world instances. System composed of several classes which are needed to define real world objects.

Layer level architecture used in PARE.NeT offers to solve various problems in different appropriate layer. System is divided into layers, to decrease problem complexity. For example, Database layer covers information indexing, stored procedures, tables, associations through our object concept. Enterprise Library (Microsoft Data Access Application Block, etc.) used in accessing information from database and processing

information. System based on .Net Framework 3.0 and .Net Compact Framework 2.0. WorkFlow is used for systematic information flow that we need in education. Web Services with Workflow used to search information and return results which cover education & orientation of parents.

Artificial intelligence used in PARE.NeT leverage the presence of fresh and updated data, and Web 3.0 concept provides semantic information cycle in PARE.NeT. PARE.NeT is highly cares about educating parents with trusted and accurate information. Because of that, it always refresh and filter information. Moreover, everyday PARE.NeT collects new information and it optimizes this information to use in parents education. To find correct answers, it produces question to narrow problems with artificial intelligence.

Future of PARE.NeT

Speech Technology

Linguistic part of PARE.NeT is directly related with speech technology. Improvements on speech technology mean faster, more stable and reliable voice part in PARE.NeT. Moreover, PARE.NeT will be integrate Microsoft® Speech Server 2007 and SAPI 5.3 will be used for mobile applications with .NET Compact Framework 3.0.

Search Technology

Lack of Experience & Information part of PARE.NeT is directly related with search technology. Optimizations on search part of PARE.NeT return faster, more stable and reliable results.

Data Mining

PARE.NeT information database will grow up by the day. New solutions and problems will added in system. PARE.NeT will analyse, filter and optimize these unstructured data and make it utilizable information.

Integrating Speech Server

PARE.NeT will integrate Microsoft® Speech Server 2007. Because, Microsoft's vision is that speech will become a mainstream, pervasive technology that is accessible by any device, at any time, and from any place. This means that speech-enabled applications should be accessible by standard telephones and cell phones, and by GUI (Graphical User Interface)-based devices like PDAs, Tablet PCs, smart phones, and desktop PCs. And we saw that Microsoft's vision intersect with PARE.NeT visions.

Integrating SharePoint Server

PARE.NeT will integrate Microsoft® SharePoint Server 2007. Because, Microsoft Office SharePoint Server 2007 is an integrated suite of server capabilities that can help improve organizational effectiveness by providing comprehensive content management and enterprise search, accelerating shared business processes, and facilitating information-sharing across boundaries for better business insight. And we saw that PARE.NeT is also care about information sharing and content management.

Different Methods to Get Information

For example, various state information can be obtained from babies except voice to improve communication between babies and parents.

Related with NetFx3 Technologies (Vista)

WF is used in PARE.NeT. WCF, WPF and WC can be used in PARE.NeT in near future.

Web 3.0

PARE.NeT is also based on future web concept Web 3.0. Because, PARE.NeT supports artificial intelligence technologies and the semantic web and three dimensional interaction and collaboration.

Researchs

PARE.NeT supports research about baby language, baby care and parents education. For instance, new words can be added into baby language by interpreting and comparing babies voices and reactions. Moreover, everyday new information will be added PARE.NeT information database and PARE.NeT will optimize this information to use in parents education.

This new informations, obtained with the assistance of PARE.NeT, will be used future research that to work in the interests of humanity.