Interaction Design for Home Computing

Visual Communication

Poject III

Interaction Design for Home Computing

submitted in the partial fulfilment of the requirements for the degree of

Master of Design in Visual Communication

by

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Guide: Prof. Anirudha Joshi

IDC
IIT Bombay
June, 2004

approval sheet

Visual Communication

Project III entitled

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Guide _____

Chairman _____

External examiner _____

Internal examiner _____

contents

acknowledgements

When I first conceived this project, I had thought it would result in an improved experience in the use of PC at home. My guide **Prof. Anirudha Joshi** suggested me to look at it in the perspective of the tasks at home and whether the device integrates with the home needs. This gave my project a new direction and sure enough, after seemingly never ending states of confusion, I thought I came up with some futuristic but plausible ideas. And then again I went astray by neglecting the interaction aspect of the project altogether. This acknowledgement would indeed be incomplete if I failed to mention the patience and forbearance of my guide in continually trying to put me back on track.

I am also grateful to **Prof. Ravi Poovaiah** for providing newer insight into my project.

I would also like to thank my classmates, especially, **Gautam Karnik** and **J Rambrijesh** who helped me by discussing my project and provided valuable inputs. The **attendees** of the **DEP course** at IIT on HCI, the **participants** of the workshop on **Contextual Inquiry** and **HCI** at IDC also helped me a lot by taking a part of my project for study.

Also, my neighbours, friends and relatives have been a great sport in answering my questions regarding computer usage at home. I must also thank my **mother** who came up with a great name for my device. Last but not the least, I cannot forget the support of my family- **Aai, Mayank** and **Kaustubh** who have been tolerant about my preoccupation with my project.

abstract

Technology **affects life**; it is meant to do that. But it seems absolutely illogical and unfair that it should **compulsively** change the way people live. It is evident that the personal computer is **completely impertinent** to the home environment, its needs and the physical placed and **not blend** with the family lifestyle. A study of these, as well as of those **devices** which **work well** in the household suggest some **strategic changes** to the approach of bringing a computer into the home setting.

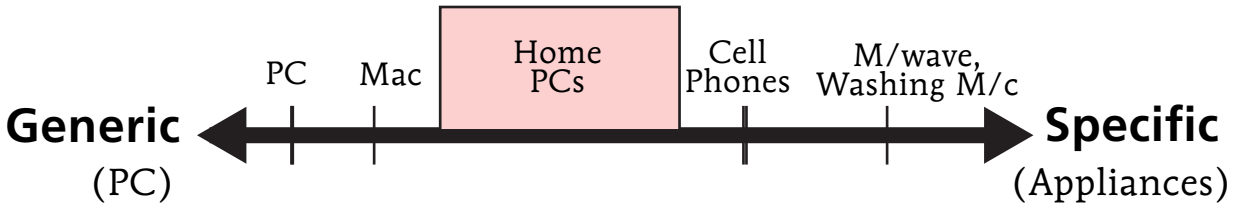
A brief overview of the **Indian household** needs and home environment suggests the needs for **reminders, family communication aids** and assistance in **household tasks**. Management of **finances** in a loosely handled and inconsistent household is a mammoth task itself. Also, the need for **latest information** relevant to the family cannot be denied in this information age.

'Yojak' is an attempt to **bridge the gap** between the PC and the Indian home needs. It is a home computer with the basic form of a **digital calendar.** In India, **family schedule**s revolve around the calendar, **family accounts** are maintained on a calendar and most home **information** comes from the calendar. In effect, this is mainly what the Personal Computer aims to do today to the home setting- yet quite ineffectively. ***'Yojak',*** with the **metaphor of a calendar,** radically changes the scene and the computer achieves a **physical, psychological and emotional 'space'** in the household.

introduction

The current **computing scene** in homes in India represents a **huge gap** between **technology and people.** Not only is the technology **unfit** for the scene, but people also have a strong **apprehension** against its use. Yet, with the advent of **newer technology** in the consumer market, it is becoming more and more logical and imperative that it should **fit into the home life** and not be yet another **gizmo** that gets thrown onto the scene.

The personal computer at home is a technology derived from **office desktops** being forced into homes- into a completely **different setting** and **purpose**. The use of **technology** is preposterous too- latest processors, multimedia kits and huge memory just for **small tasks** at home. **Setting up** the computer is a pain in the neck too, and with innumerable wires getting entangled one cannot even think of **relocating** it in the house.



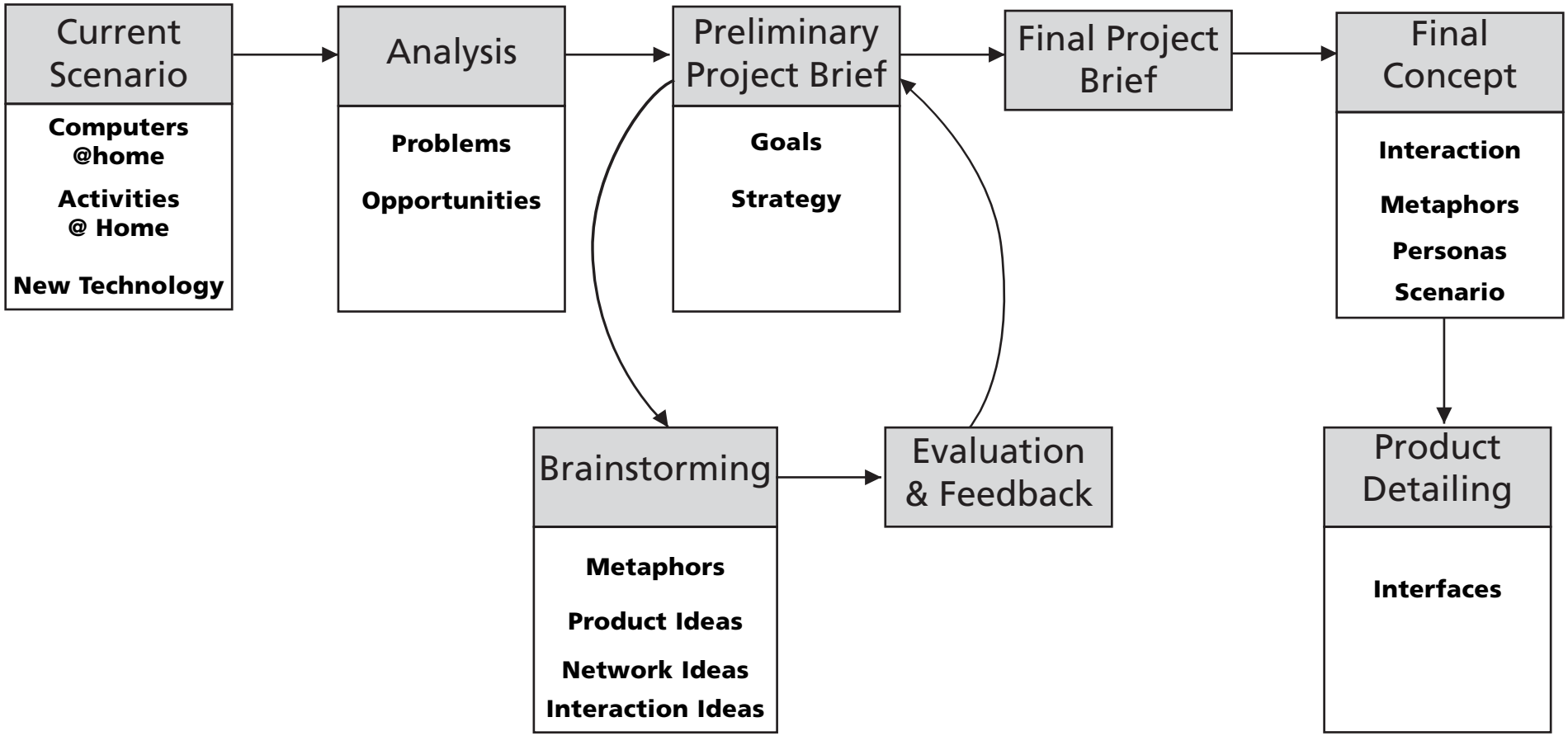
And if this is not enough, one has to **learn** to use computers- at least a crash course is essential, typing and mouse pointing being **additional skills required.** Added to this, is the use of **language, images, contexts** and **metaphors** that are utterly unfamiliar and **culturally inappropriate.**

While comparing computers with **other devices** meant for home use, such as a telephone or TV, it would be realized that they are **highly intuitive** in nature and **blend** with people's **lifestyles**. One is able to perform at least some **basic operations** on these devices. Why, then, should a highly technologically advanced device end up being a **nuisance** in the house?

There is a dire need to understand the **relationship** between family as a **social unit** and computer as a formidable **social intervention**. ***What technology can do in the household is not the same as what household wants to do with the technology.***

This project attempts to explore the **current scene, problems, possibilities, opportunities and innovations** for interactions in home computing in India.

project guideline/ methodology



data collection

understanding PC and home computer

"PC- a computer designed for use by only one person at a time"

Personal Computers

According to Encyclopaedia Britannica, a Personal Computer (PC), a computer designed for use by only **one person at a time**. A personal computer is a type of microcomputer - i.e., a small digital computer that uses only **one microprocessor**. Personal Computer is a generic term used to describe many kinds of small format personal computer systems found at schools, homes, and offices.

When personal computers first began to appear, existing manufacturers of large computers tended to regard them with disdain but market trends proved otherwise. In 1981, IBM launched their first PC for $1,365, which, if nothing else, sent a very powerful signal to the world that personal computers were here to stay. The advent of the **general-purpose microprocessor** heralded a new era in computing — microcomputer systems small enough to fit on a desk could be endowed with more processing power than monsters weighing tens of tons only a decade before.

Computers at home

The operational definition of a home computer is, a **personal computer in home setting**, capable of performing at least three functions such as word processing, running educational software, business programs and games.

Historically, computers have been developed to meet the work related needs of individuals and organizations. Computing in the home involves a high degree of **work related emphasis**. The technology perspective suggests that the computer has **office/ work bias** built into it – to the extent that the term 'home computer' appears to be a misnomer.

Home computer has assumed a **new significance** for families at the end of 1990s because of its **connection to the internet**, and it is becoming an integral part of family life for better or for worse.

"Home computer - a personal computer in home setting"

understanding homes and home computers

Identifying home activities

From personal observation of Indian families, a **list** of some of the activities at home was prepared. These were then categorized into **tasks, entertainment and interaction** activities. This list was further **enriched** by **interviewing** some families and in some cases just individual family members.

Questions

What work do you do at home? What is your family's daily/ weekend schedule? What activities did you perform in the house last week?

How do your family members relax at home? When was the last time your family had fun together? What occasion?

What are the entertainment preferences of the members of your family? What arrangement do you have for the same?

How do you communicate with your family and relatives? Which communication devices do you have at home? Which electronic devices do you have at home?

For those having computers at home:

What was the driving force for you family to own a home computer? What is the configuration?

What activities do you perform on your computer (member- age- activity wise)?

How has the PC affected/ displaced the other activities you earlier performed?

home computer usage

Why home computers?

In today's scenario home computer usage can be broadly classified under the following purposes.

For knowledge

Children use computers at home for **educational purposes**- either to learn computer itself or to prepare reports, presentations, drawings, illustrations etc. for academic purpose. Also, use of **internet** for information regarding academic projects is becoming increasingly popular.

For connectivity

E-mails, chat, video conferencing, Internet surfing. Also, to handle personal tasks like net-banking, payment of **bills**, online shopping etc..

For entertainment

Multimedia applications like **games, music, movies** etc. Another concept among younger children called 'edutainment' is becoming very popular with the advent of many multimedia companies designing CDs for children.

What comprises home computer?

Applications

Word processors, email clients, presentation software, spreadsheets, basic graphic utilities, digital photo editing, web browsers, multimedia applications, file management.

Software

MS Office, MS Paint, Outlook, Imaging, Internet Explorer, Windows Explorer etc. on Windows.

Hardware

Pentium 4 processor with **1.8 Giga Hertz speed**, 256 Mega Bytes of RAM, **40 giga bytes of memory**, DVD drive, monitor, keyboard, mouse, modem, speakers, webcam, microphone, TV tuner card, USB port for external devices.

home computer usage

Who uses home computers?

Children – toddlers to college going kids.

Husband, Wife

Elderly Parents

How do they learn to use computers?

Most people acquire computer knowledge from **work** or learn in **schools**. The new generation has grown up with computers at home and become computer literate long before they learn it in schools, just by watching or having the freedom to **fiddle around** with it.

Persons with no prior (work related or educational) knowledge of computers take **special training** or a **crash course** from acquaintances or coaching classes.

Elderly people in the house resort to the minimal and most essential aspect of computers- email and chat. Usually, the younger generation initially **personalizes** the usage for them (such as creating an email account) and briefs them with the **steps to be followed** for performing specific tasks. They **make notes** of the exact steps and use these notes every time and **strictly follow** the notes.

home computer usage

Where is the computer located in homes?

The location of the computer in the house is governed by the **principal user** of the machine in homes. When the child is the principal user, it is placed in the **child's bedroom**; if parents are principal users, they keep it in their **own bedrooms**.

Where there is a **family room** which is different from the one meant for guests, the computer finds its place there, that is, if the entire family uses it.

The time allocation for computer usage in homes

Kids use **after school**, parents during **evenings** or late nights, **weekends** and **holidays**.

The usage chiefly resembles the TV viewing times at home.

Driving Force for having a home computer

For kids education

For connectivity

To keep up with times

To learn

...?

tasks at home

Home work (?)

Cooking, storage, cleaning, washing, housekeeping, shopping, budgeting..

Self care, child care, baby care, finance management, bills...

Home entertainment

TV/ Radio, Music, Video

Reading- newspaper, magazines, books

Games- cards, chess, etc. board games, solo games

Writing- diary, poems, letters, cards

Hobbies- craft, art, knitting, stitching, collecting, cooking

Fitness & Exercise- gym, swimming, yoga, aerobics

Home interaction (family/ togetherness)

Talking- sharing experiences, happenings secrets, feelings, wisdom, nostalgia, at meal times..

TV / video- watching together

Notes and messages– fridge notes, reminders, feel good notes, sms..

Reading- reading aloud stories to kids..

Games- cards, chess, etc. board games..

Hobbies- craft, art, knitting, stitching, collecting, cooking...

Festivals– puja, celebrations, rituals, gifts...

Relatives- happenings, sharing photographs, nostalgia, anecdotes, about kids growing up, sending gifts...

tasks at home

Home communication

Telephones/ mobile phones

Answering machines, voice mails

Fax

E-mail/ chat

Post, Telegrams, Phonograms

Ham radio

Intercom

Security cameras/ baby watch

Home appliances which use computer

Microwave

Water purifiers,

Washing machine

Television, DVD player, music players

Refrigerator

Cordless telephones, fax machine, answering machines

....

new technology

Presented here is a **brief overview** of some of the latest products and technology prevalent in the computer world today.

Computers:

PDAs

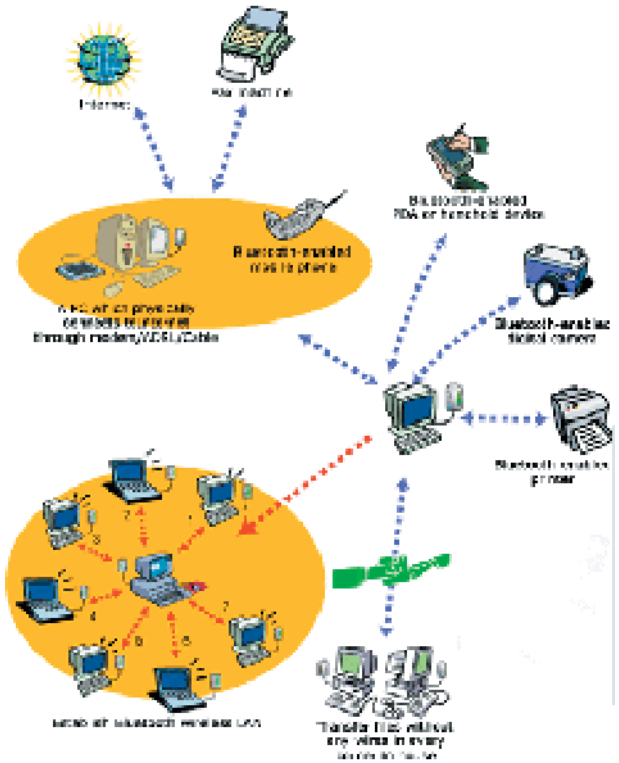
PDA is a **Personal Digital Assistant**. A small **hand-held** computer typically providing calendar, contacts, and note-taking applications but may include other applications, for example a web browser and media player. Small keyboards and **pen-based input systems** are most commonly used for user input. A PDA may also be referred to as a **Palm**. It comes under various brand names such as Palm, Palm Tungsten, IPaq, Palm Zire and Pocket PC and Newton.

www.att.com/spotlight/broadcasters/ sbtv-pda.html

Tablet PCs

Tablet PC, it is a type of **notebook computer** that has an **LCD screen** on which the user can write using a special-purpose pen, or **stylus**. The handwriting is digitized and can be converted to standard text through **handwriting recognition**, or it can remain as handwritten text. Tablet PCs also have internal speech recognition software. One can use the pen to make **'gestures'- predefined movements** to complete common tasks. They can optionally have a keyboard and/ or a mouse for input. The orientation can be changed (vertical/ horizontal) according to the convenience of the tasks to be performed.

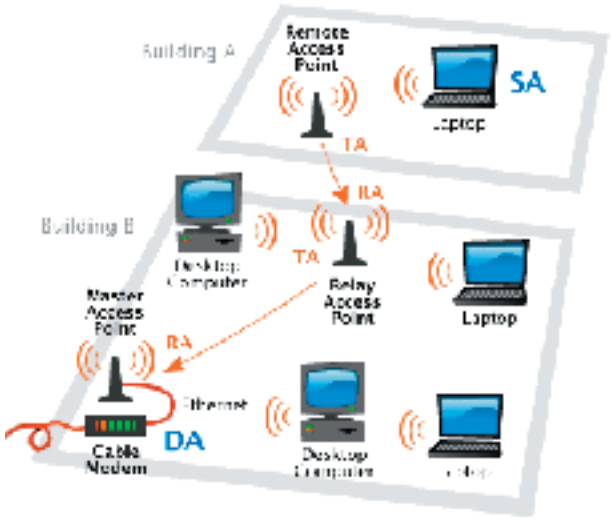
new technology



Input devices

Touchscreen :

A touch screen is a computer display screen that is **sensitive to human touch**, allowing a user to interact with the computer by **touching pictures or words on the screen**. Touch screens are used with information kiosks, computer-based training devices, and systems designed to help individuals who have **difficulty manipulating a mouse or keyboard.**



Network:

Bluetooth:

Bluetooth is a **technology** that **enables links** between computers, phones, PDAs, and the Internet and provides interface, synchronize, exchange of data. It enables s**eamless voice and data connections** between a wide range of devices through **10 meter range** digital two-way radio. Bluetooth technology is revolutionary in the sense that it **redefines** the very way we **experience connectivity**.

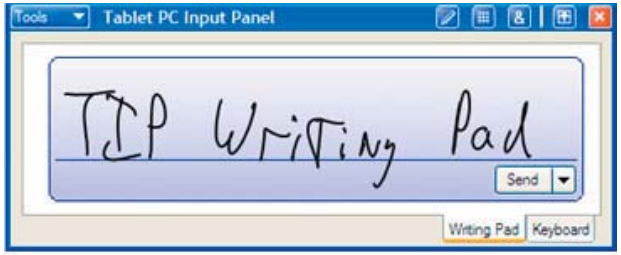
Wi-fi:

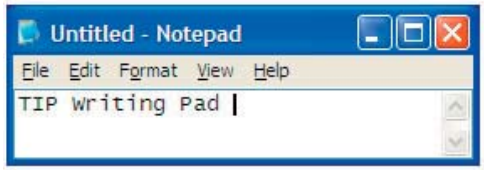
Wi-Fi is short for **wireless fidelity**. This is a wireless networking technology for PCs and PDAs that **allows multiple devices to share** a single **high-speed Internet connection** over a distance of about **300 feet**. It can also be used to **network** a group of PCs without wires. Wi-Fi is gaining popularity in institutions, offices and public places such as coffee shops, hotels and airports.

The **Bluetooth** wireless technology and **Wi-Fi** are **complementary** technologies.

www.visidyne.com/ telepresence.htm
www.a2.com/images/ bluetooth.gif

new technology





Relevant computing terms:

WAP (Wireless Application Protocol)

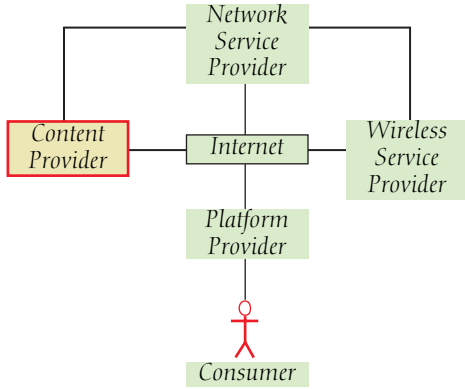
WAP provides a universal open standard for **bringing internet content and value added services to mobile phones** and other wireless devices. Simply put, it's a special way of **formatting content** so that it can appear on **small screens**, like those on wireless phones or PDAs. WAP is becoming a global standard for developing and delivering Internet content to wireless devices.

Handwriting recognition

Handwriting recognition is the technique by which a computer system can **recognize characters** and other symbols **written by hand**. In theory, handwriting recognition should **free us from our keyboards,** allowing us to **write and draw** in a more natural way. It is considered one of the key technologies that will determine the ultimate success or failure of PDAs and other hand-held devices. To date, however, the technology has had only **limited success**. This is mainly because it is still a young technology and is not as fast or accurate as it needs to be.

Content Provider

An organization that **packages and delivers information**, data or resources **to mobile phone users or network operators**. These services could be shopping, web surfing, chat rooms, playing games, accessing data such as music and books through a server.



http://www.mshost.net/pics/wap.jpg

http://www.microsoft.com/windowsxp/expertzone/columns/vanwest/images/hanrec_fig01.jpg

analysis

family and computers

PC usage

Patterns of home computer usage are **twofold**, one relates to the **characteristics** of the **technology** itself and other to the characteristics of the **user**. The patterns also vary according to the user's **prior experience** with computers (as in work settings), the **learning experience** that results from continued product use after its acquisition, and the **household structure** (eg. presence or absence of children in the home).

We can broadly classify the types of uses of computers at home according to the activities performed.

Education- CD ROMs, Word processors, spreadsheets, presentations, graphics.

Edutainment- CD ROMs

Entertainment- Movies, music, games, online games, jokes, trivia

Communication- Surfing, email, newsgroups, chat, net-meetings,

Information- News, analyses, references, articles

Utilities- ticket bookings, net-banking, bills, shopping

Age Groups vs. Usage

4 -12 yrs- Entertainment, edutainment

12 – 24 yrs- Education, entertainment, communication, information

24- 45 yrs- Communication, information, entertainment, utilities

40 – 55 yrs- Communication, information, utilities

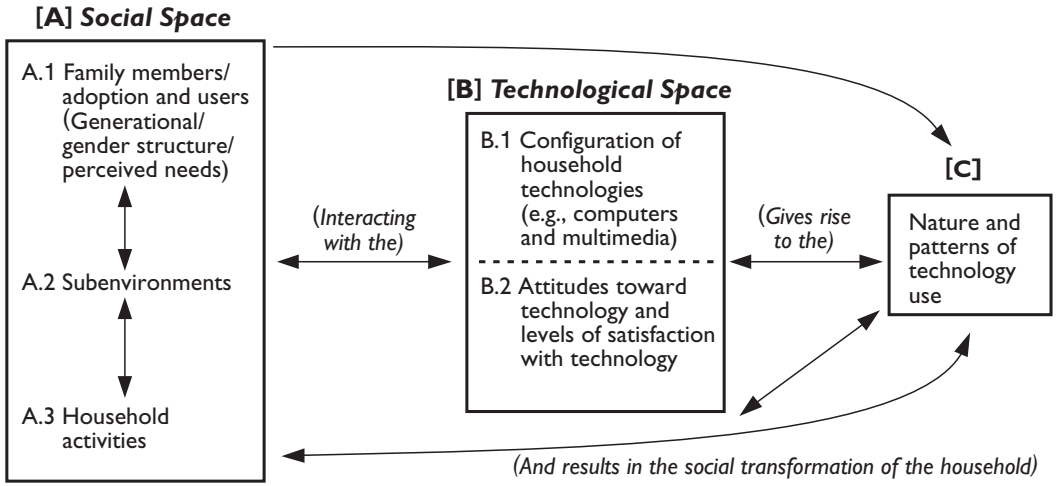
55+ yrs.- Communication

(This is a very **broad classification** and varies according to user's exposure to technology and experience.)

family and computers

PC usage and Home activities

Technology has **displaced** some household activities. There exist historical parallels- **television** created new modes of entertainment, displacing other forms (eg. movie attendance). The extensive use of **telephones** has reduced written communication. It is not always the case that new technologies displace household activities. Some of them actually **lead to improvements** in the way some activities are performed; most **household appliances** fit this description (eg. washing machine, mixer grinder).



Household structure and technology use

Although the **television** allowed family members to come together, the **increased family unity** was **'passive'** rather than **'active'**. Meals and bedtime **suffered rearrangement**, but interest in other recreational and social activities was **not seriously** affected.

A **parallel** may exist in the **time shifts** due to computing at home. **Computing**, however, is a different activity in a number of ways. First computing in the home demands a **higher level of interaction and involvement** than television. The computer users engage in **time trade-offs** – other activities have to be suspended. Second, computing has a very strong instrumental and task-oriented **problem solving features** rarely exhibited by television. Home computing persistently **satisfies narrower needs**.

'Computers and other interactive technologies for the home' 1996, Alladi Venkatesh

problems in home computing

Tasks performed:

The personal computer, though located in the home, has not become a 'home computer' and is **not sufficiently integrated** into the social context of the household. Not many **household tasks** can be performed on or through a computer.

As **stand alone units**, their usefulness is **limited.** But other stand alone **technologies work well** at home – refrigerators, televisions, telephones, washing machines. These technologies are **well integrated** into the **household environment** since they were **originally developed** as household technologies, and not derived from industrial applications. They were designed to **assist** the **household tasks.** Computers do not fit in such a well defined scenario.

Language barriers:

Since English is the **common computing language** in India, the non English speaking household have an **aversion** to computers by default. India being a **multilingual nation**, most people use more than one language in their daily life. Focusing on English narrows down their means of expression.

Conceptual model:

The **conceptual organization** of a computer from the **user's point of view**, is the conceptual model of the user. It is that knowledge which allows the **understanding of how a system works**, and how it can be arranged to provide benefits.

To most people, the conceptual model of the computer is **unclear** for the computer mechanism as well as the virtual environment. Since the current **interaction provides no clues**, people either **construe a wrong idea** or choose to **ignore** that aspect, which results in their **rote learning** of methods.

problems in home computing

Male vs Female, Young vs Old:

A definite **gender and age bias** exists in terms of the **principal users** of home computers. Whereas **male adults and younger generation** account for majority of computer usage at home, the **female adults and elderly people** together account for the remaining usage. We can **compare** this observation with the other **household technologies**, such as telephones and kitchen appliances, which are **female dominated.**

Home status:

Computers are **not** given any specific **privileged status** in the **domestic technological context**; they are **not** viewed as **essential** to the running of the household. There are more **strategic technologies** in the home such as telephone and refrigerator. With the advent of internet and popularization of emails, **web connectivity** seems to be the only strategic **use** of the **computer**.

Expected and actual use of computers:

There exists a **large gap** in the **use** of computers **as expected** at the time of buying and its **actual use** in the house. Home finance/ management application has practically become a non-use. That is because the home management applications require elaborate software and higher skill levels as compared with word processing.

Educational uses earlier were complex and more demanding than the entertainment uses. But software and educational professionals have developed educational tools using entertainment aspect of the new media, and the concept of **edutainment** is becoming highly popular today.

problems in home computing

Location:

Computers do **not** occupy a well **defined physical or social space**. Families are not sure where to place the computer- in the living room or the bedroom.

'Learning' computers:

The **learning curve** is **very high** in terms of **jargon** and **metaphors used, the capabilities and conventions**. The interfaces are **language dependent** and have no compatibility with **Indian languages**. **Typing skills, mouse movements** need to be perfected before one can use computers efficiently.

The learning effect of computers that requires more of an individual's attention, causes **more time** to be spent at the **early stages** of computing activity.

People's perception:

Computers are a **job oriented technology**, not a domestic technology and are still perceived as **tools of job related work**. Computers are perceived as **complex machines requiring skills** not commonly meant for people.

Installation :

Computers, unlike other devices that only need to be **unpacked and plugged in**, need **installation** of hardware and software, requiring **expert guidance**. **Cleaning and relocating** within the house is a nuisance because of a number of **wires** and **power connections**. Error messages and trouble shooting also requires expertise in terms of **hardware and domain knowledge.**

Family interaction:

The home computers today do **not support family interaction** or joint usage. Family members **take turns** at the home computer.

interaction issues

The **issues** that need to be tackled as far as computers for the home are **manifold**. But in the current scenario, we can focus on some major issues.

Learning curve– Interaction should be as intuitive as possible with minimal learning

Language freedom- Should be compatible with the diverse Indian languages, maybe more than one language at a time.

Conceptual model- Should be obvious to the user to be able to identify problems or troubleshoot.

Networking- Since home and personal devices are meant for enhancing life, they could be networked with each other to provide extensive usage.

Interfaces- Should be more contextual, less of computing jargon, more home-domain oriented (metaphors, capabilities, conventions etc.)

Applications- Should not be cluttered with too many applications, provide for family environment but support personalized devices too.

I came across a very **enlightening paper** and cannot resist quoting from it. Due to lack of space, I am just presenting its **highlights** on the **next page**. It is disheartening to note that even **25 years after** this paper, the issues discussed in this paper seem to have been **grossly ignored** by the computer product developers in the world.

interaction issues

'Design Consideration for an Anthropophilic Computer'

(May 1979) for ***'Anne'*** the Apple Computers' dream project.

by ***Jeff Raskin***

Outline for a computer designed for the ***'Person In The Streets'***- PITS

- Truly pleasant to use

- Will do nothing to threaten the user in his or her pervasive delight in being able to say 'I don't know the first thing about computers!'

- Profitable to sell, service and provide software for

Taboo:

- A system which requires the user to ever see the interior of the computer (or the posterior?- SD)

- Additional stuff except that which can be understood by the user as a separate appliance.

- Any item that does not stand on a table by itself, does not have its own case, does not look like a complete consumer item by itself.

- Seeing the guts

- Things in sockets

- Billions of keys on keyboard

- Computerese

- Large manuals/ many manuals

- Plethora of configurations

- External wires beyond the power chord (10 points extra if you eliminate the power chord)

- Differences in models that have to be documented in manuals

- No accessories except the optimal printer

The best candidate:

- Must have single lump (CRT, keyboard, disk integrated into one package)

- Portable (under 20 lbs), have a handle

- Fits under airline seat

- Has at least two hour battery.

preliminary project brief

"To design computing interaction for the home environment that blends with the home settings is intuitive and promotes family interaction."

concepts

project ideation

Possibilities

Hardware and software:

- Keep existing hardware, enhance the interfaces

- Modify existing hardware, enhance interaction

- Design new hardware for the current usage of computers at home

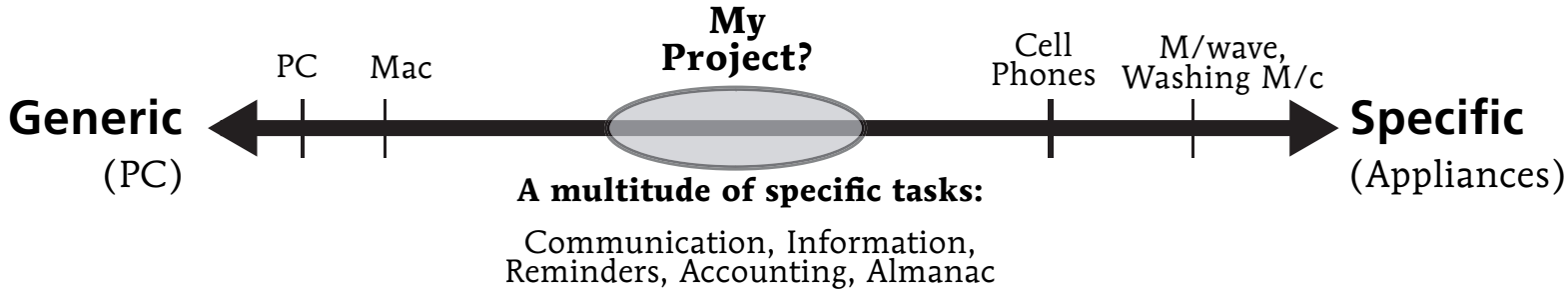
- **Design new hardware to include applications for the home use.**

Target User:

· Target on one user group (age wise or knowledge wise)

· Design separately for various user groups since all live in one family.

· **To come up with a design which suits all home users (generic)**



project ideation

Starting Point

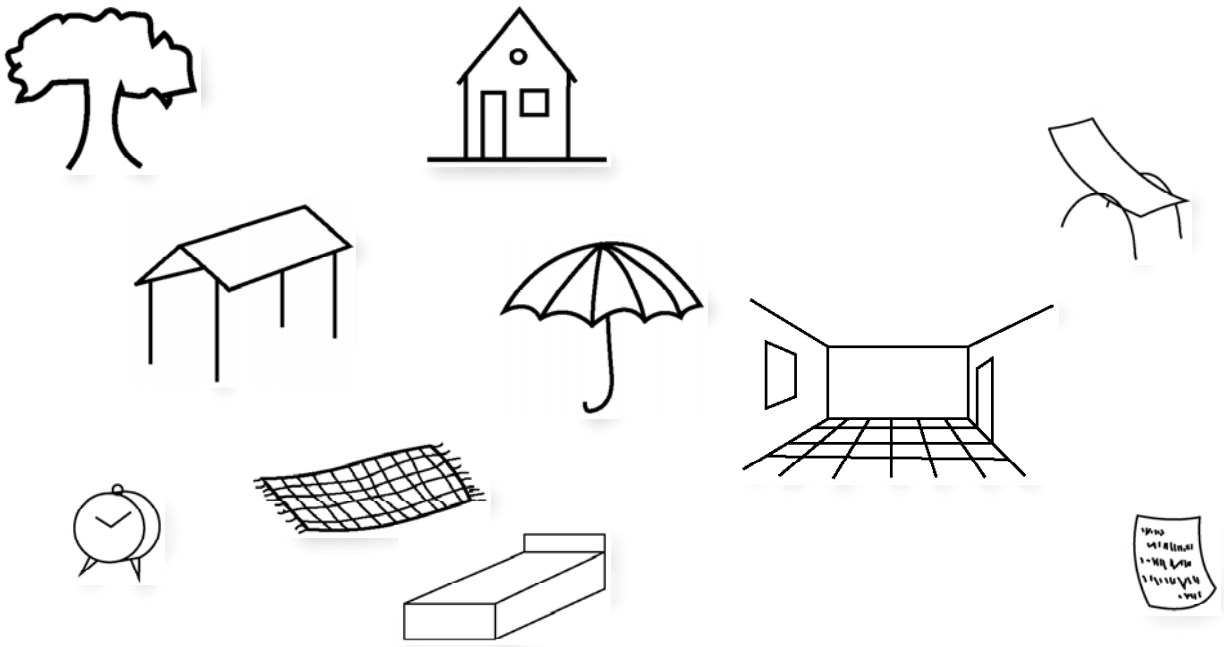
(Concept of a home computer)

Users

Family (comprising of children, youngsters, parents, elderly parents)

Character:

Togetherness, hierarchy, head of family, decisions, sharing, festivals, chores, self development, learning, experience, devotion, attachment, safety, caring



Environment:

Comfort, 'at home', cosy, relaxation, environment, fun, sincere, serene, quiet, playful, Living room, dining room, kitchen, bedroom, garden, verandah, balcony, picnics, holidays...

Metaphors:

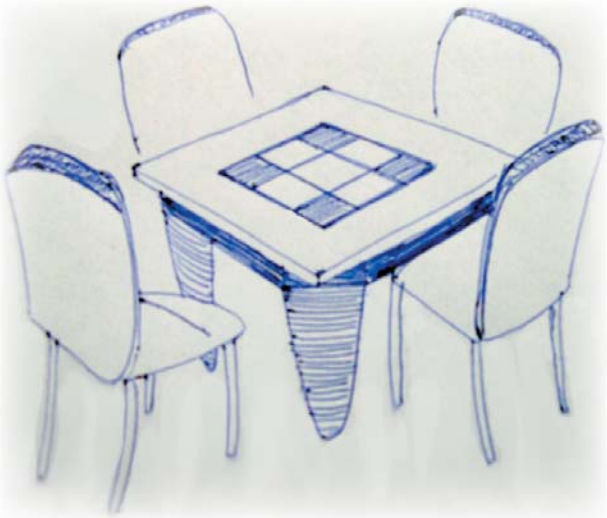
Home, shelter, umbrella, banyan tree, blanket, rooms, bed, easy chair, food, door, doormat. window, drapes, curtains, wall paintings, flower vase, alarm clock, reminder notes, lunch box, calendar, picture frame, spectacle case, dining table, place mat.....

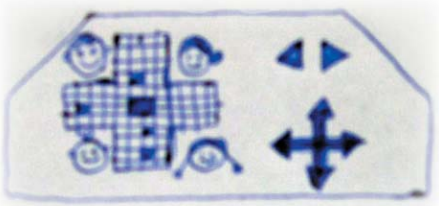
brainstorming

Devices:

Family game @ work:

Small game of four or five moves (word game/ board game) one move per person, and one last move after coming home. Sense of **being connected** throughout the day.

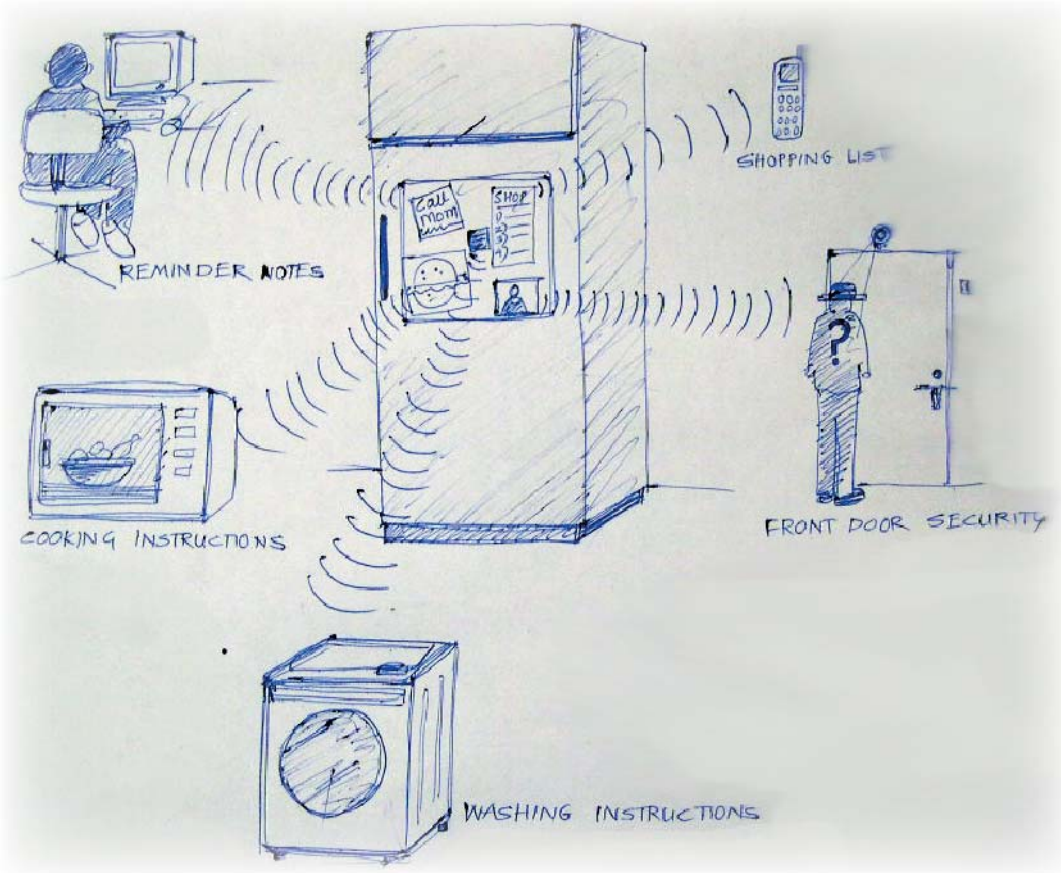




brainstorming

Fridge computer

An **activity hub** that connects to individual devices at home and outside.



brainstorming

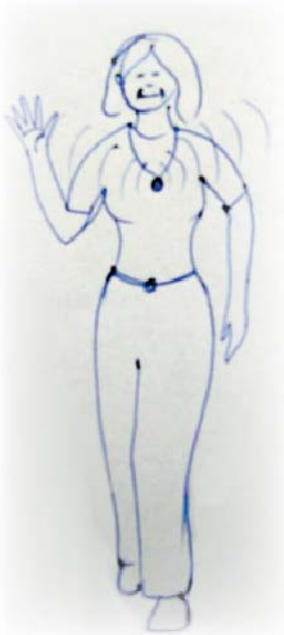
Calendar

A **family planner**, photo album, family expenses, grocery lists, notes etc...

brainstorming

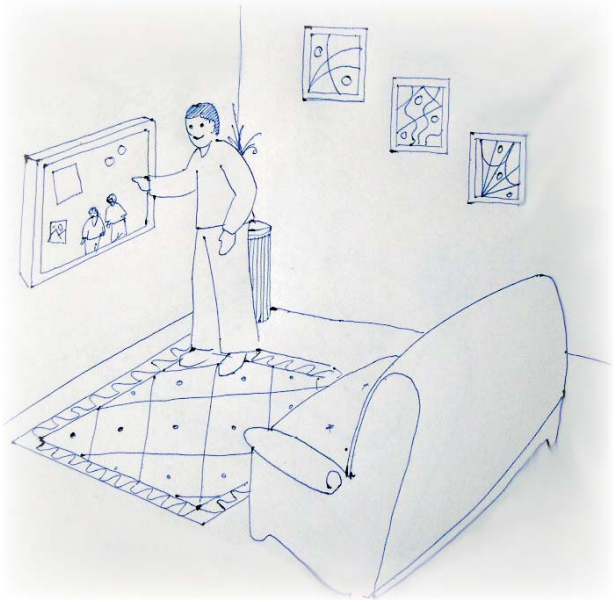
Photo objects:

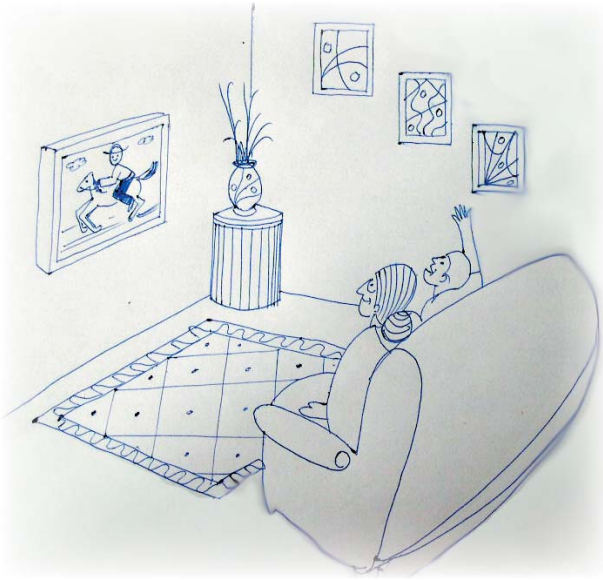
Vase, cube, picture frame, showing imprints of random family pictures, pendant, organizer.



brainstorming

Family space:
Turning into TV space



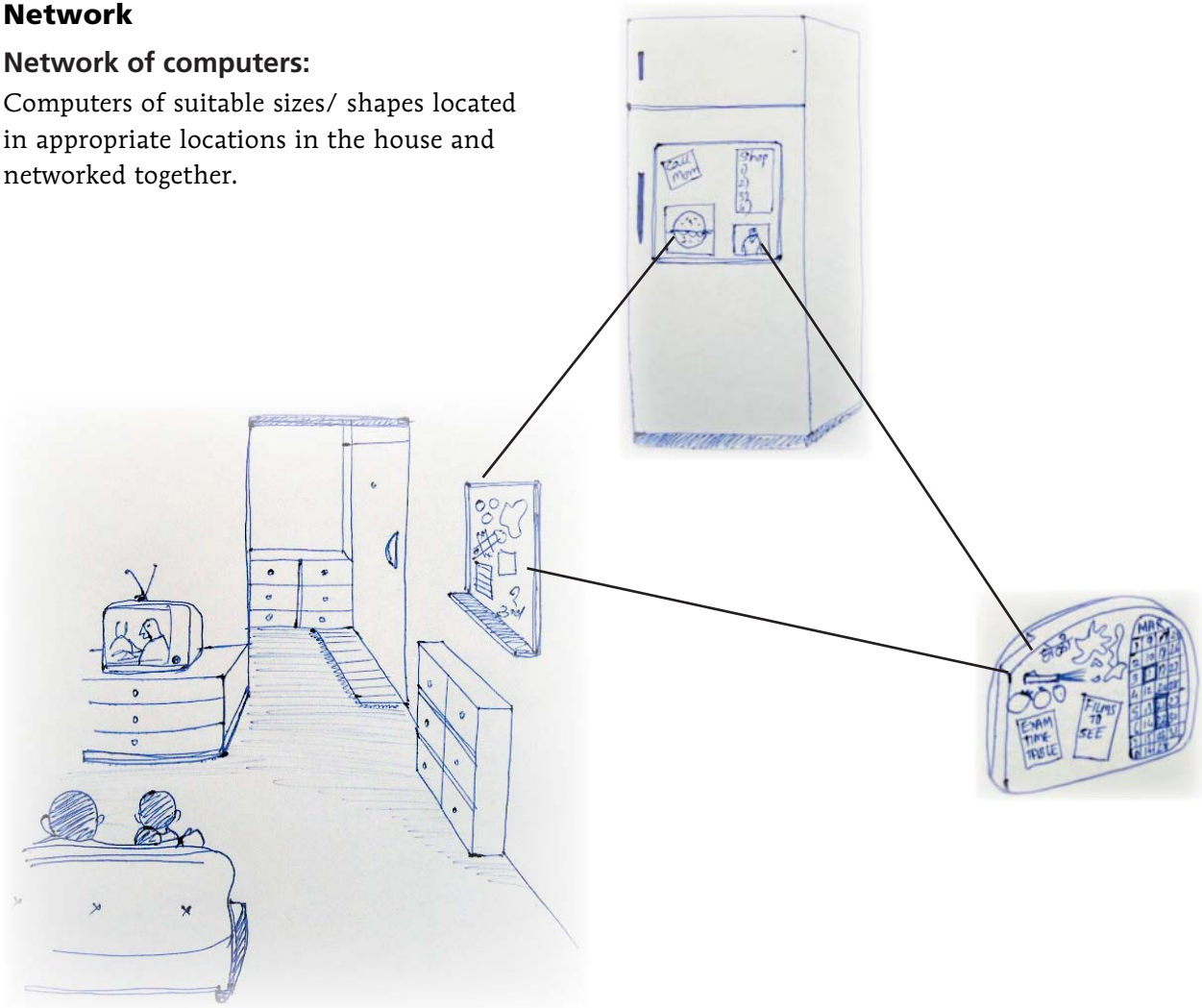


brainstorming

Network

Network of computers:

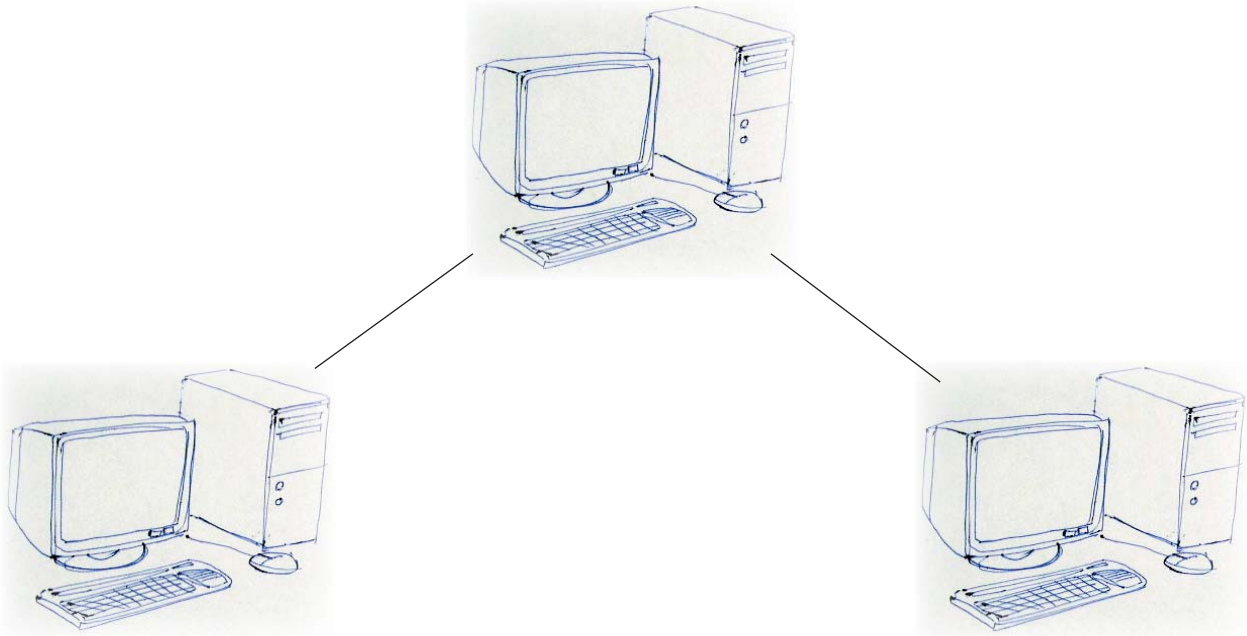
Computers of suitable sizes/ shapes located in appropriate locations in the house and networked together.



brainstorming

Server and terminals:

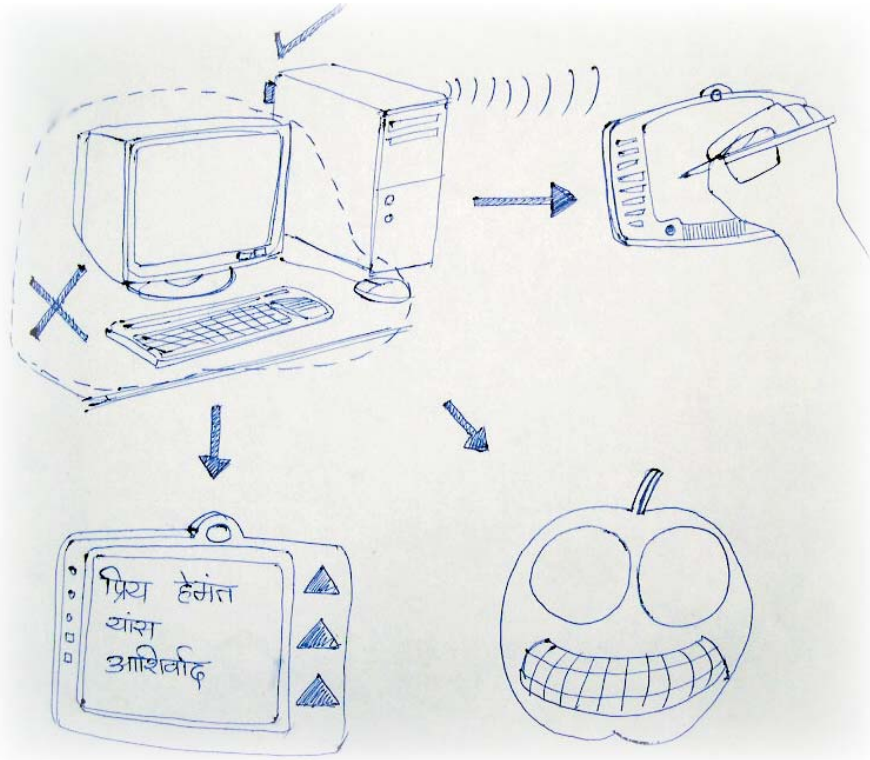
One main server where memory and processing occurs and terminals at suitable locations or portable with the desired people, which act only as input output devices.



brainstorming

Single computer with different input/ output devices:

Computer at a single location in the family (possibly with small input points located elsewhere in the house). Interfaces for family and individual family members vary.

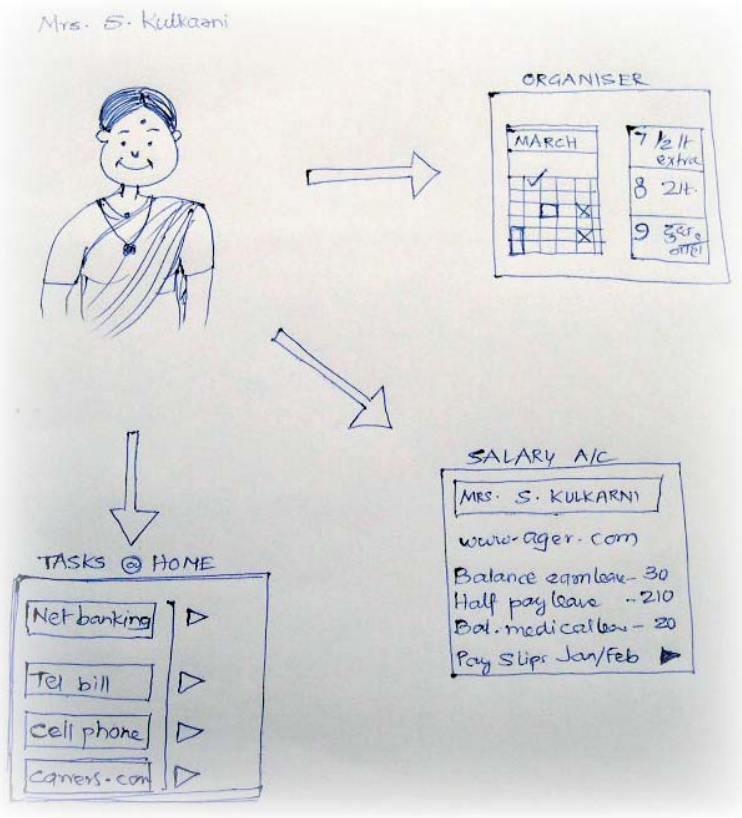


brainstorming

Computing Concepts

Individualistic interfaces:

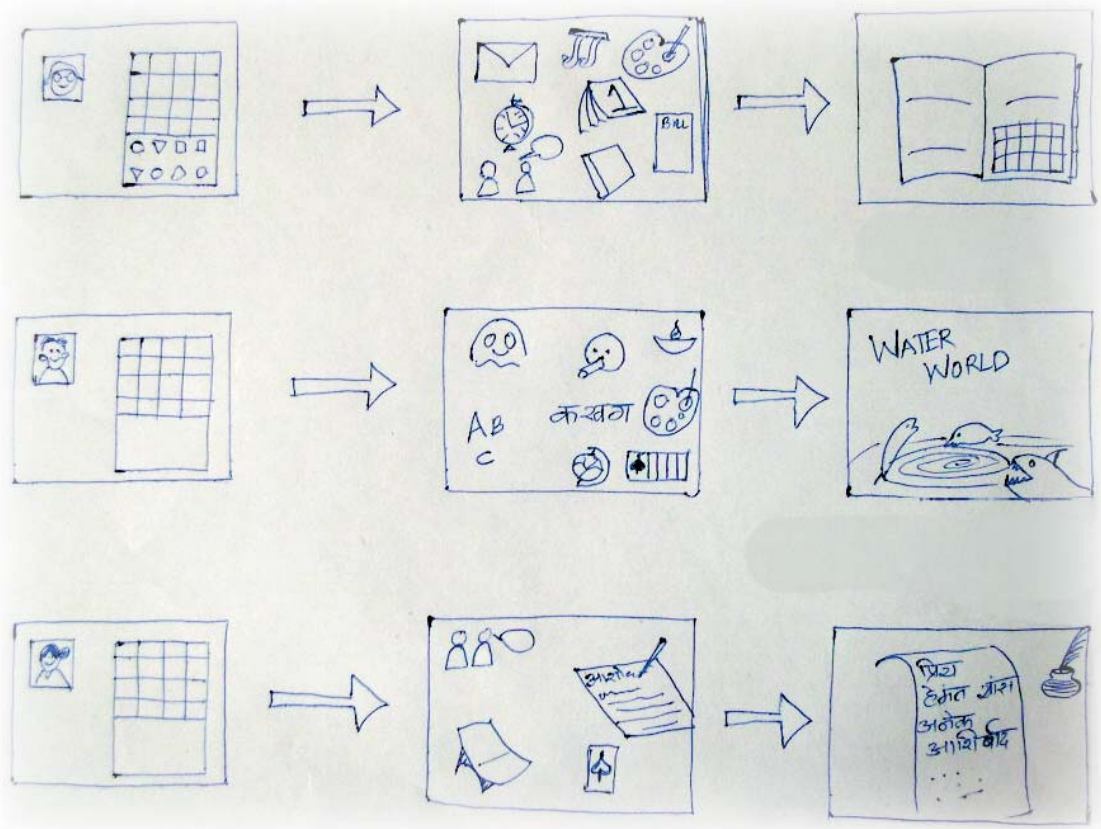
Priorities of activities of an **individual** family member listed out and interfaces designed for that individual.



brainstorming

Family interaction:

Listing of **family activities** (together/ individually) and interaction designed for the purpose.

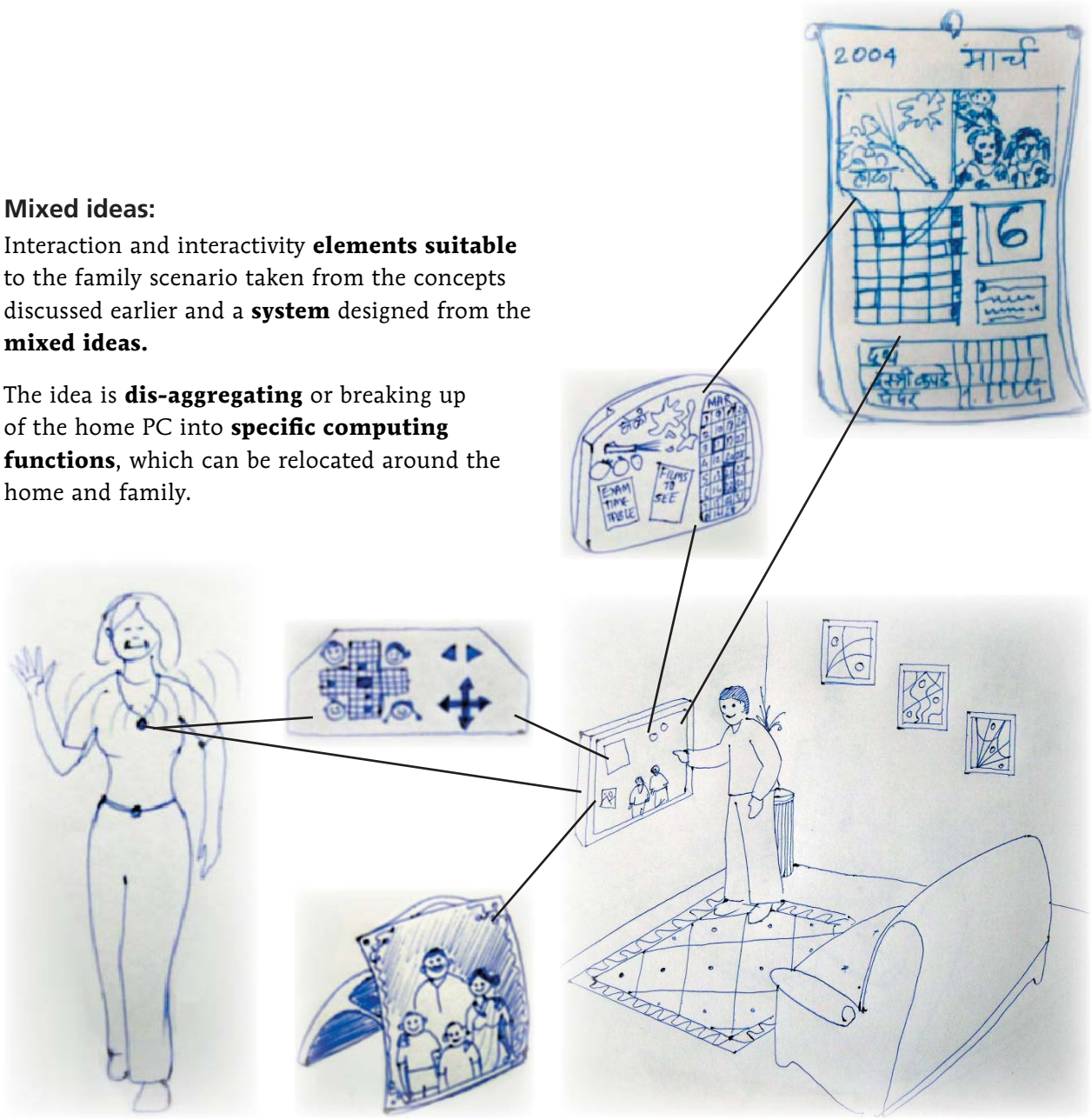


brainstorming

Mixed ideas:

Interaction and interactivity **elements suitable** to the family scenario taken from the concepts discussed earlier and a **system** designed from the **mixed ideas.**

The idea is **dis-aggregating** or breaking up of the home PC into **specific computing functions**, which can be relocated around the home and family.



feedback

After presenting the initial concepts stage and **discussing** them, I got varied responses from teachers and classmates. I must mention them here since proved to be very **influential** to my design process.

- The **ideas/ devices** seem to have been **forced** on to the home user.

- Home life seems to be **going fine without** the computer. What makes my devices so **relevant and revolutionary** that one would want to acquire it?

- The devices do **not** seem to solve any **specific problems** at home or perform any **specific task.**

- Are the devices meant to satisfy the **emotional needs** of the user or to be some **decorative elements**?

- Can any device really enhance **family interaction**? Does a family really need to **resort to a device** to improve interaction? Can such devices be a **replacement** for the traditional family interaction?

- Will a **'solutions approach'** work, where I try to **fit in** a device in the given scenario? Would a **'problems approach'** not work better, where I **identify specific problem**s and find specific **solutions** to the problems?

primary and usability goals

The entire process of **study, analysis, ideations and feedback** calls for preparing precise product goals. The product necessarily requires to have the following characteristics.

- Product should strategically focus on the **enhancement** of existing domestic **activities and needs.**

- There should be a **clear product perception**- no gender, age or domain bias for the product usage should exist. The **whole family** is the effective user.

- The **physical place** for the product in the household should be clearly defined. It should fit into the domestic environment.

- Product should be such that it does **not necessitate any learning**- computing concepts, typing skills etc. **Intuitive** interaction is a must.

- Operation should be **language independent**. (some necessary text should provide language choice)

- The product should give a **clear conceptual model** its capabilities, its network and platforms.

final project brief

"To design computing interaction for the home environment that blends with the home settings, is intuitive and performs specific tasks for home."

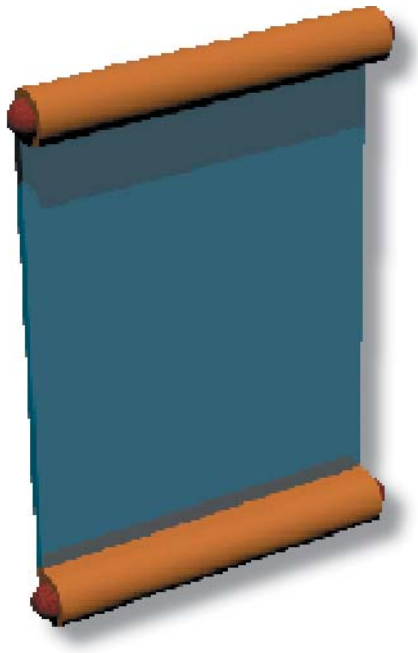
final concept

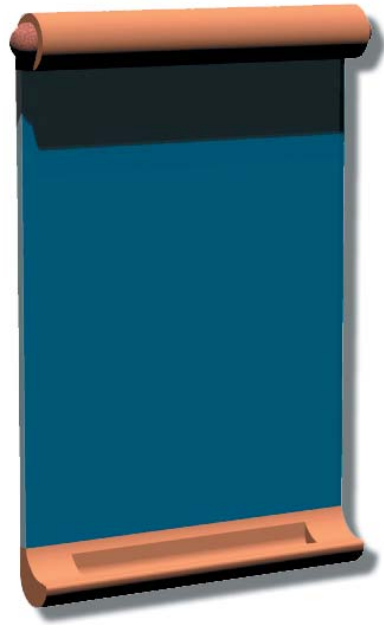
final concept

‘Yojak’

This is a device is a **digital calendar** consisting of two units - one located in the kitchen and the other in the living room.

Other **personal devices** of family members such as cellphones **networked** with these devices. It is also connected with a service provider which provides access to the internet.





Calendar as a metaphor

Most **family schedule**s revolve around the calendar. Most **family accounts** are maintained on a calendar Most home **information** comes from the calendar.

The digital version is an **extension** of the current calendar also in terms of its **place** in the house. Families **identify well** with calendars, and the digital version gives them a **clear conceptual model** of what the **device represents** and what it can do in the household.

calendar as a metaphor

Current usage

Notes (Birthdays, exam time table, shopping list, personal info in code/ symbol.)

Accounts (Milk, presswala, gas, body weight, maids, petrol)

Messages

Almanac (Chaturthi, Ekadashi, Chandroday time, Auspicious days, Festivals)

Holidays

Recipes

Railway time table

Bank interest rates

Horoscope

Other Info- (Articles- yoga, beauty tips, investment guide)

Good place for pinning up sewing needle :-)

New Possibilities

Notes - can give reminders, grocery list/ shopping list, can be retrieved from cell phone

Accounts- can calculate

Messages- can be conveyed to individual cell phones

Almanac- can give reminders

Holidays- reminders

Recipes- can be downloaded, audio instructions while cooking

Railway time table- latest info- reservations, additional air/ road travel info

Bank interest rates- Banking, bill payments

Horoscope- personalized

Other Info- through internet

Emails- concept of family mailbox, family chat, family communication

calendars at home

What people write down on calendar:

Milk - Daily quantity from doodhwala.

Presswalla : Number of clothes, rates, date given, date returned

Gas cylinder- When started, when booked, when arrived.

Maid - Days maid is on leave.

Newspaper- Days of vacations, other periodicals from the vendor

Grocery list- Things needed for kitchen, Grocer's accounts.

Kids- Exam time table, holidays time table.

Ladies- 'Dates' in personal code, body temperature.

Car- When serviced, petrol record, due dates, driver's record.

Exercise buffs- Daily body weight.

Telephone- Calls to make, telephone numbers

Messages- To family members, reminders, message to maid.

calendars at home

Other planners and calendars:

Personal diaries - to keep records of

Personal Expenses

Personal schedule

Telephone diary for personal contacts

Reminders, Birthday reminders

Personal notes

Health checkups (especially for elderly)

Mobile Phones- for connectivity

Phone calls

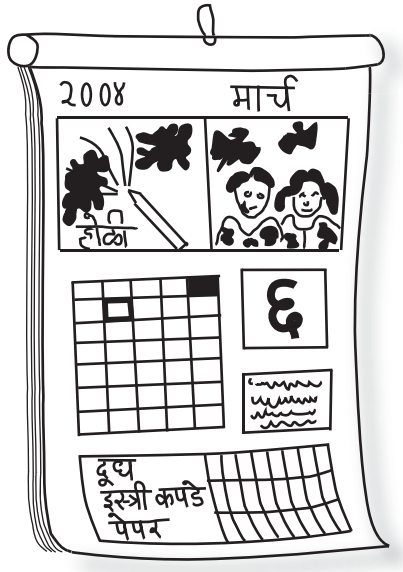
Short messages

Organizing

Telephone diary- categories(business, personal etc.)

Additional services by providers- News, city guide, TV guides, horoscopes, games, dictionary

Features of mobile phones- voice messages, auto reply, multimedia messaging,



Home diary

Telephone numbers of all relatives, family friends and important personal contacts of all family members.

Household expenses, savings etc.

Birthdays of relatives.

Important family events.

Desk planner- for students

Time tables

Planning of studies

Birthdays of friends

Holidays, vacations

final product concept

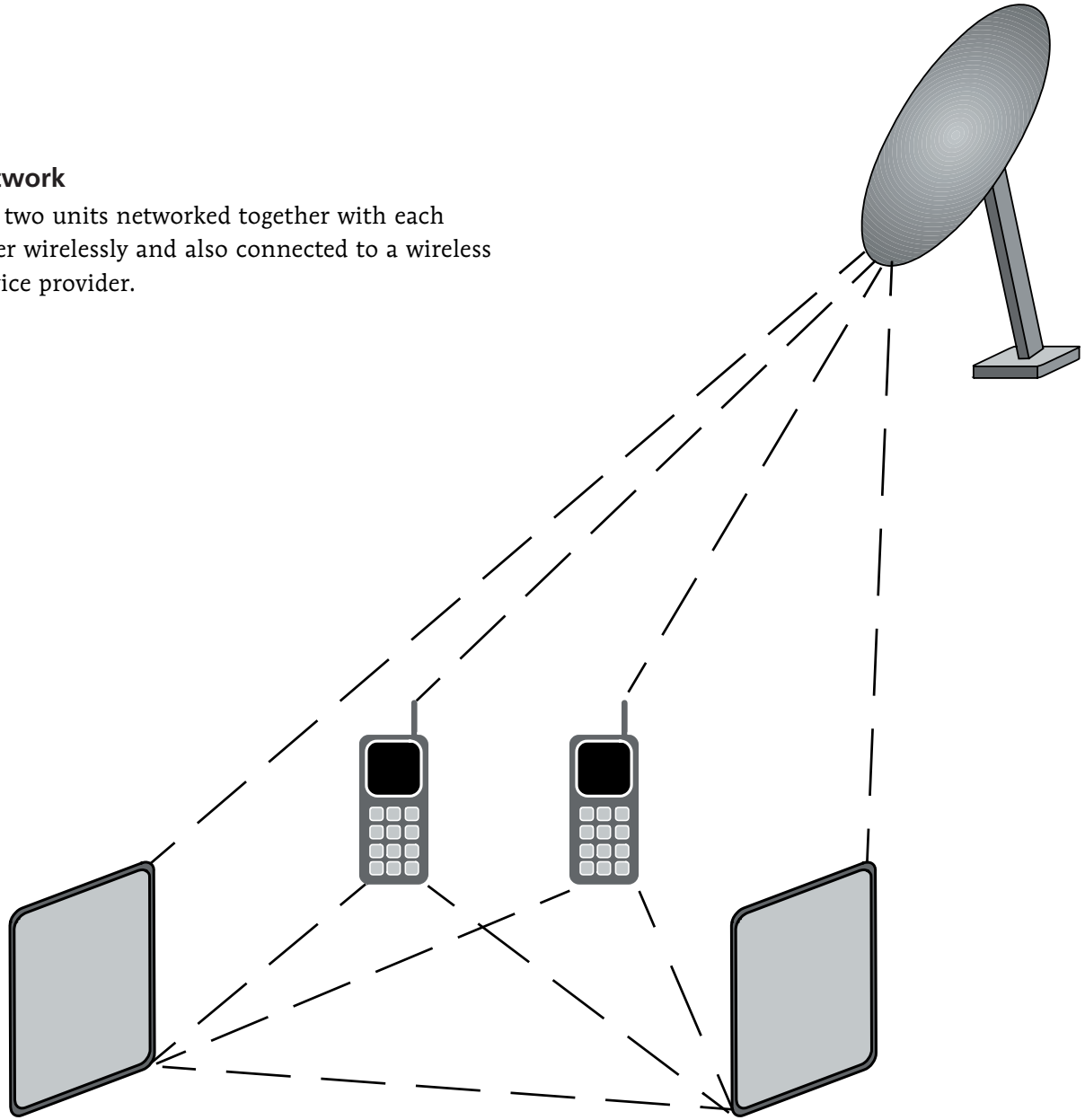
Though all the modules are accessible from both the units, the kitchen unit interface emphasizes the **daily expenses, messages and grocery**. From the information module, the **recipe** assistant appears in the foreground here. The **calendar** interface appears as a default interface.

The living room unit interface provides the **home accounting, reminders, information and album module**. The **family has a choice** to select the appearance of the default interface which can include changing **images** from the album, **message** board, **calendar** or simply the current **time**.

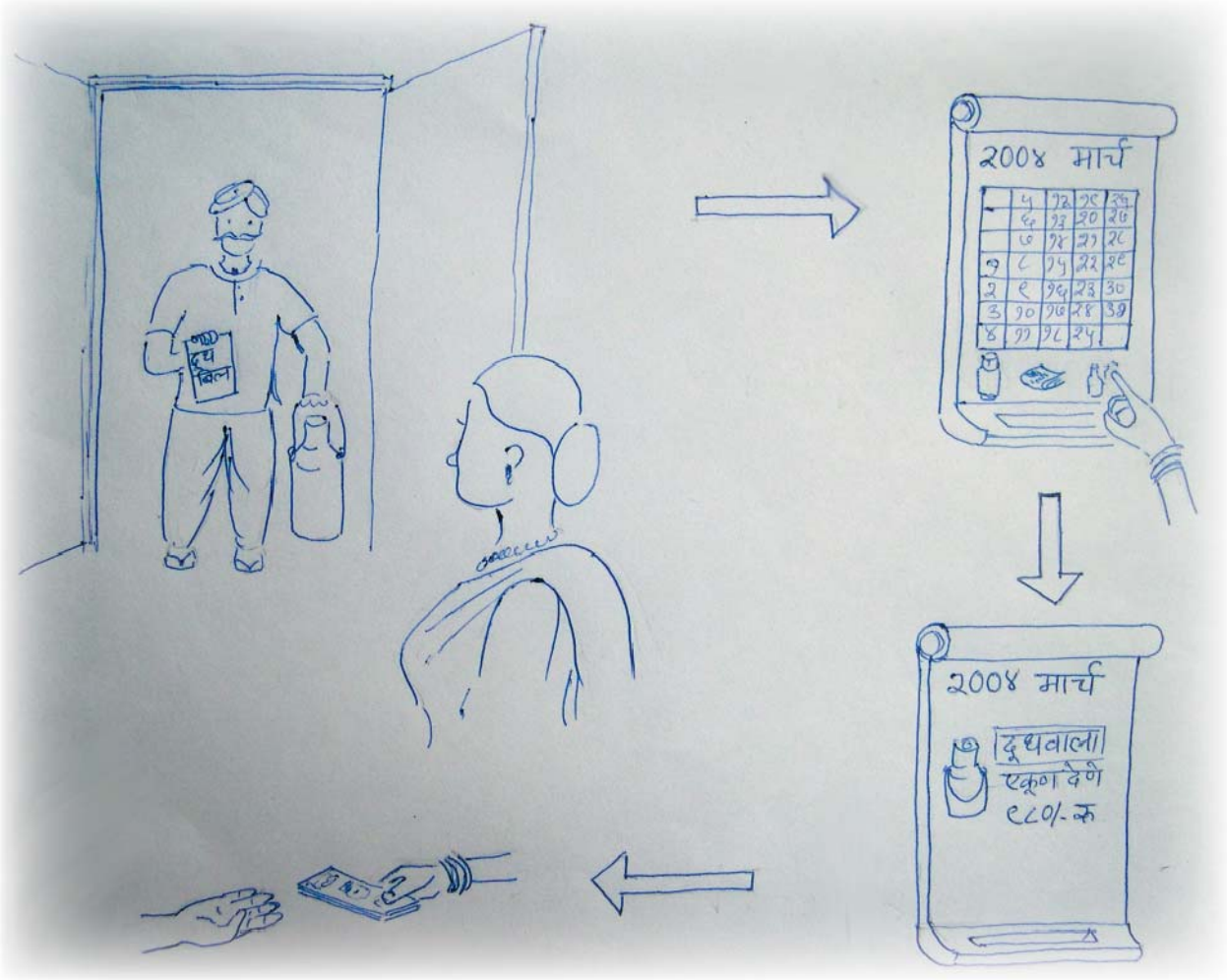
final product concept

Network

The two units networked together with each other wirelessly and also connected to a wireless service provider.



scenarios

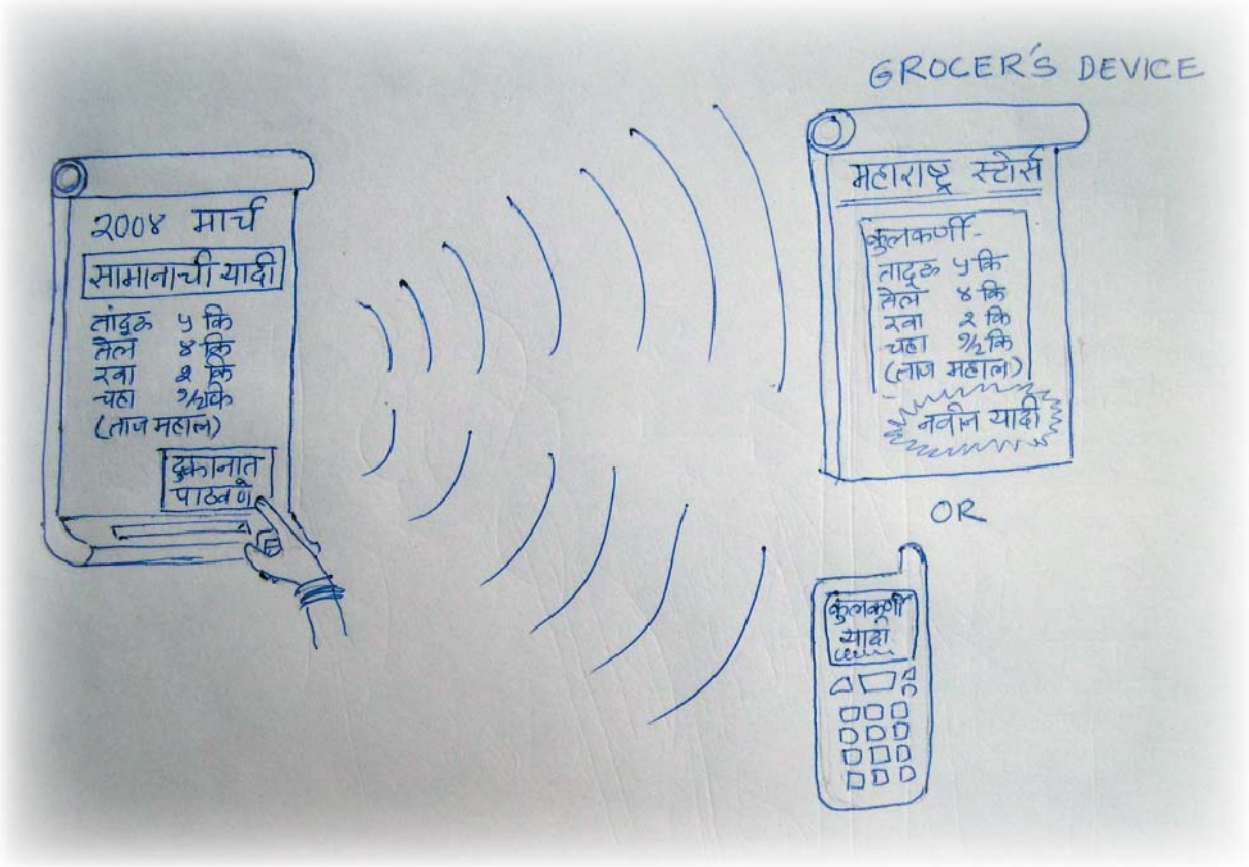


Household daily accounts

The record of daily services and expenses, advances, dues such as milkman, newspaper, presswala, house maid etc. can be maintained here.

This module keeps track of all petty expenses and automatically updates the appropriate section in the home accounting module.

scenarios

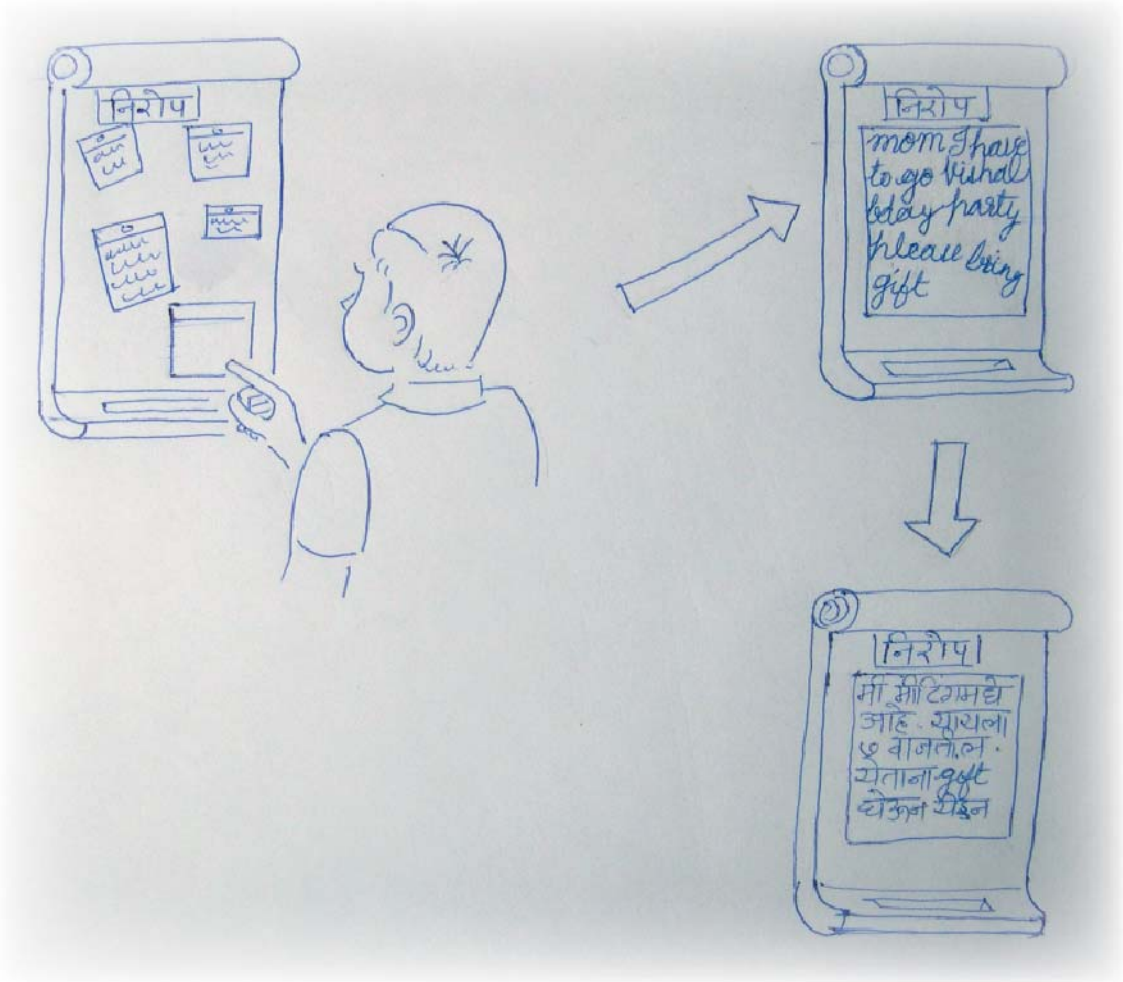


Shopping list

The record of daily needs, monthly grocery list, shopping list is maintained in here.

This module connects to the regular grocer/ vendor and can place order as and when required It also connects to the reminders section. Automatically updates the appropriate section in the home accounting module.

scenarios

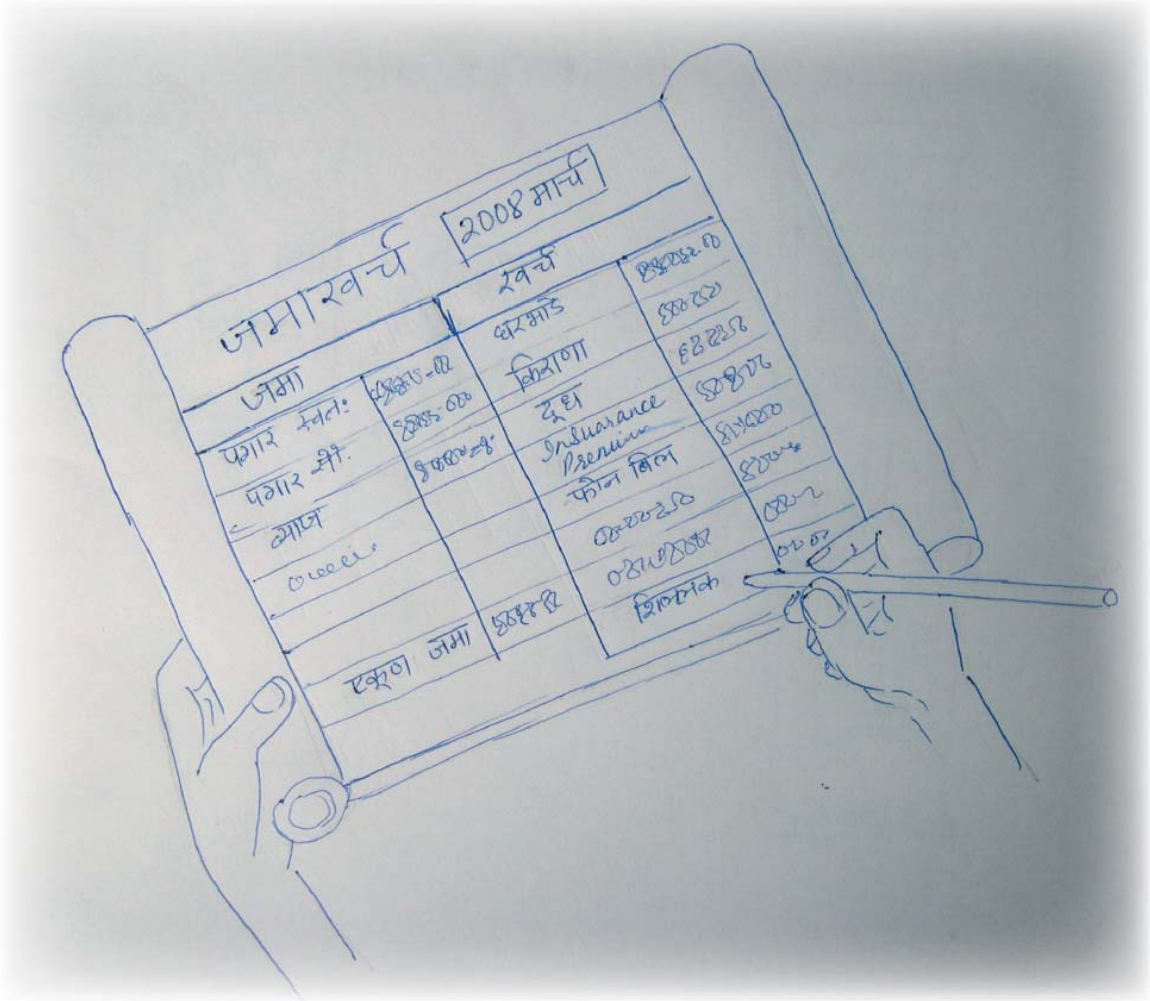


Message board

Voice, text and handwritten messages can be sent or displayed locally here.

This module connects to personal devices of the family such as cellphones.

scenarios

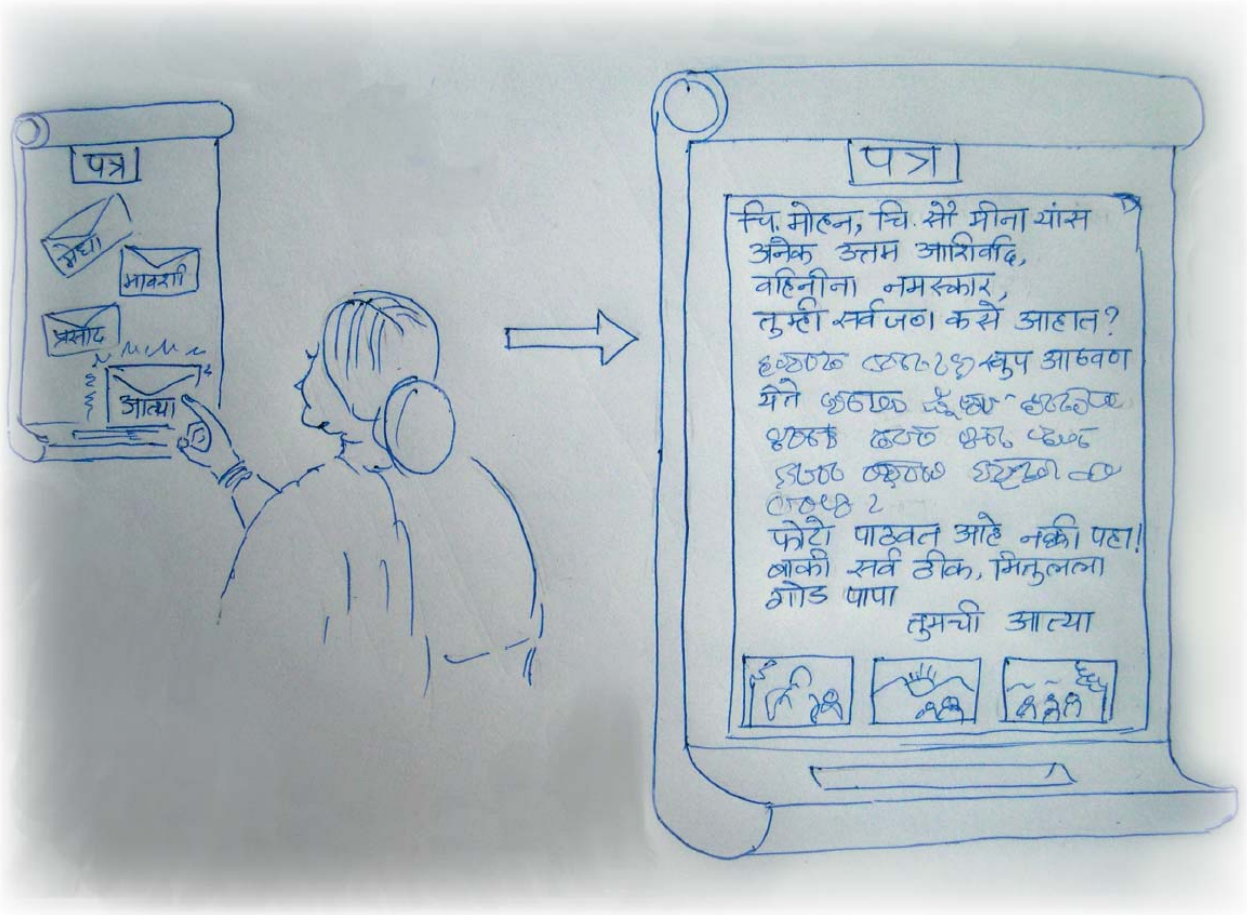


Home accounting

A record of monthly income, expenses and investments is maintained here alongwith the projected expenses and budgeting.

This module can update information through messages from bank statements, credit card companies, and other such agencies and also from any transactions done through other modules of 'Yojak'.

scenarios



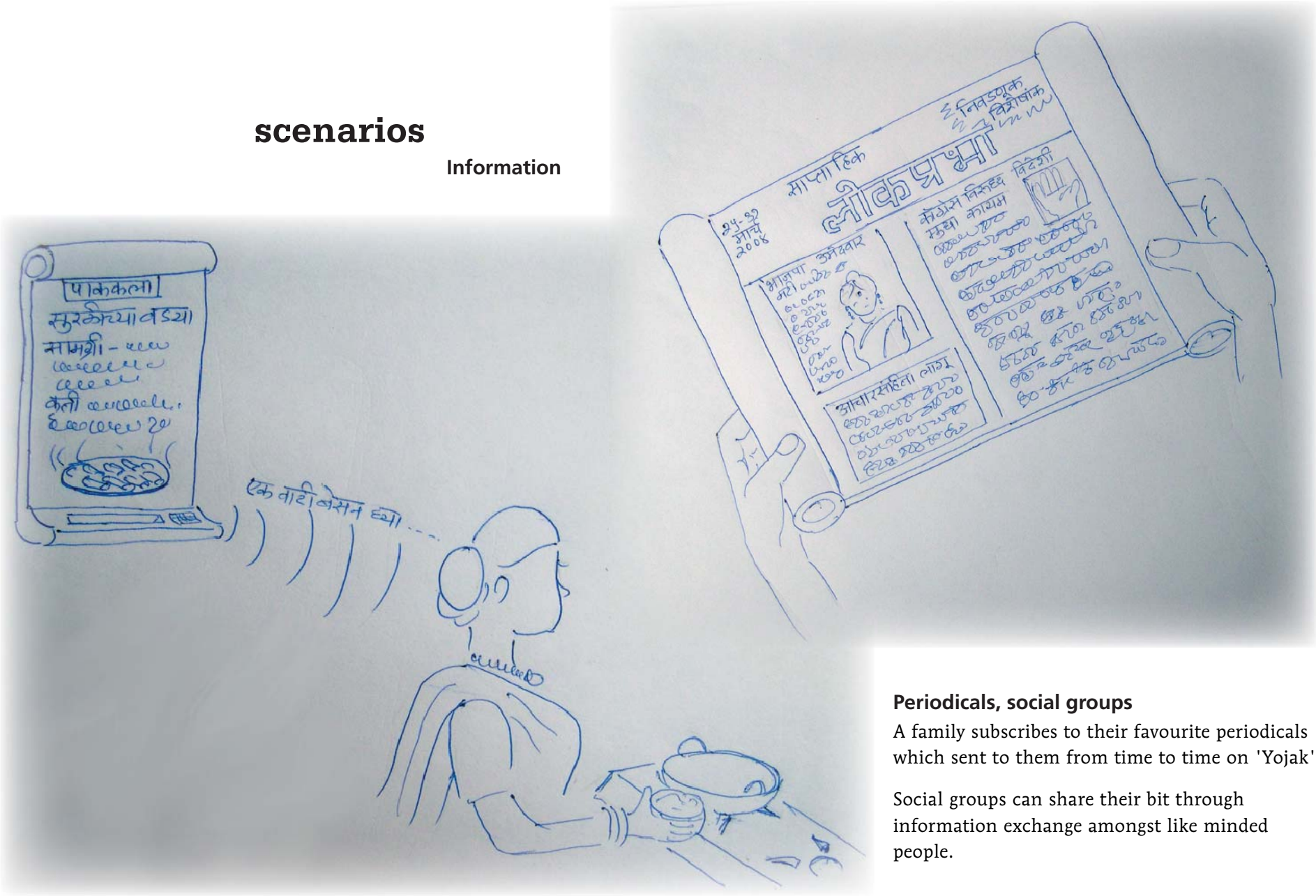
Family e-mail

All e-mails received in the family mailbox are displayed here. The concept of password is insignificant here since the unique identity of 'Yojak' comes into picture.

Written or voice messages with images or video attachments are handled here.

scenarios

Information



Periodicals, social groups

A family subscribes to their favourite periodicals which sent to them from time to time on 'Yojak'

Social groups can share their bit through information exchange amongst like minded people.

structure

Each device has **seven basic interfaces** other than the **default calendar** page. This default screen can be **personalized** according to the family choices and interests.

Calendar- Month view, notations for reminders, expenses etc. Options for almanac view, holiday list etc.

Message Board- allows writing, sending, receiving, displaying and saving of text, handwritten and sound messages

Family E-mail- Allows writing, sending, receiving, displaying and storing of text, handwritten and sound messages.

Family album- Display, sending receiving and storing of images and video clips.

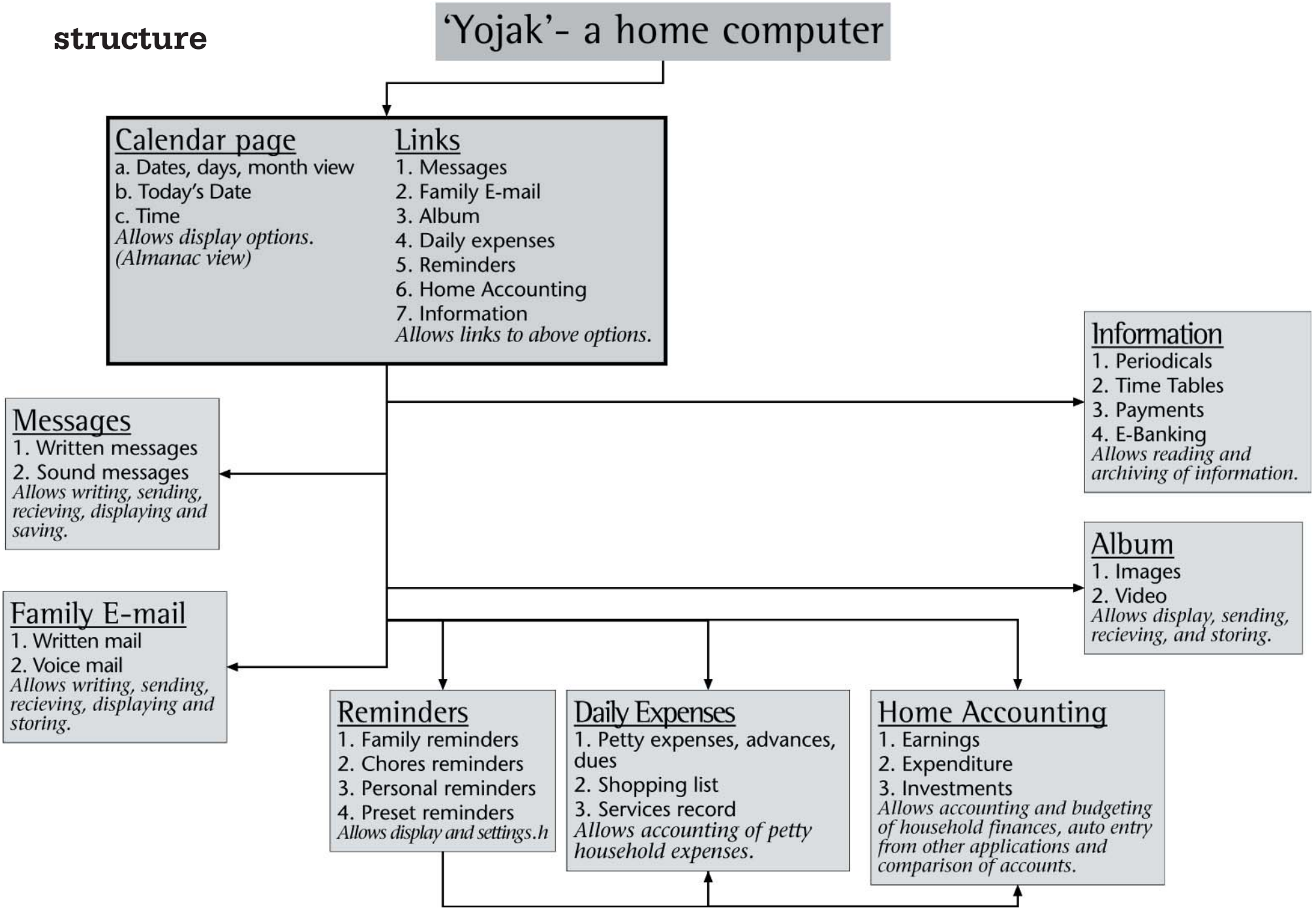
Daily Expenses- Allows accounting of petty expenses, advances, dues, grocery lists and vendor/ servant record. Links with the home accounting module.

Home accounting- Allows accounting and budgeting of household finances, setting up of auto entry from other applications, comparison of monthly, annual, actual and projected accounts.

Reminders- Allows display and setting up of family, chores, personal and preset reminders.

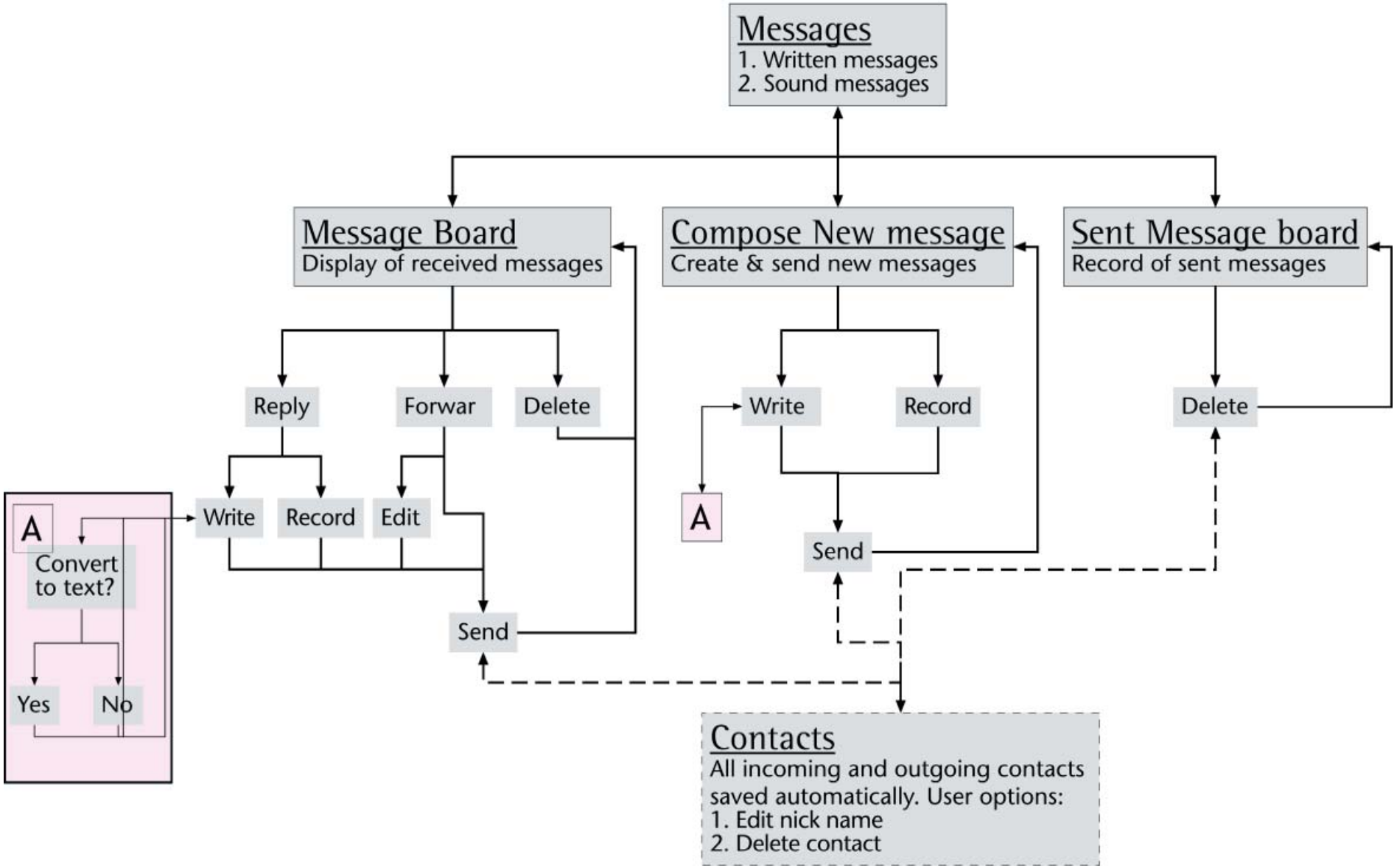
Information- Allows reading and archiving of articles from periodicals, transport time table, bill payments, E-banking etc.

structure

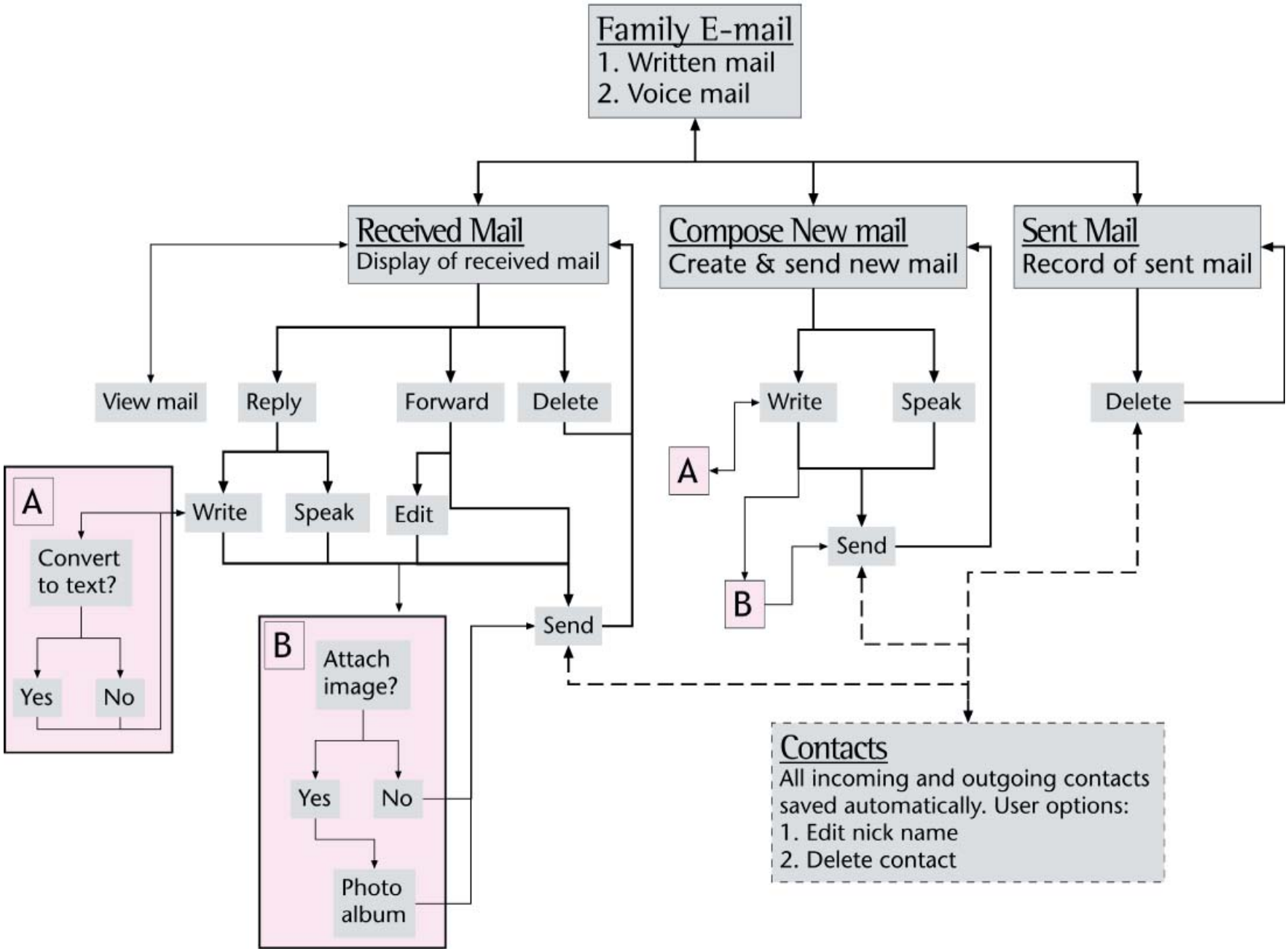

'Yojak'- a home computer
Calendar page
a. Dates, days, month view
b. Today's Date
c. Time
Allows display options.
(Almanac view)
Links
1. Messages
2. Family E-mail
3. Album
4. Daily expenses
5. Reminders
6. Home Accounting
7. Information
Allows links to above options.
Information
1. Periodicals
2. Time Tables
3. Payments
4. E-Banking
Allows reading and archiving of information.
Messages
1. Written messages
2. Sound messages
Allows writing, sending, recieving, displaying and saving.
Album
1. Images
2. Video
Allows display, sending, recieving, and storing.
Family E-mail
1. Written mail
2. Voice mail
Allows writing, sending, recieving, displaying and storing.
Reminders
1. Family reminders
2. Chores reminders
3. Personal reminders
4. Preset reminders
Allows display and settings.h
Daily Expenses
1. Petty expenses, advances, dues
2. Shopping list
3. Services record
Allows accounting of petty household expenses.
Home Accounting
1. Earnings
2. Expenditure
3. Investments
Allows accounting and budgeting of household finances, auto entry from other applications and comparison of accounts.

st

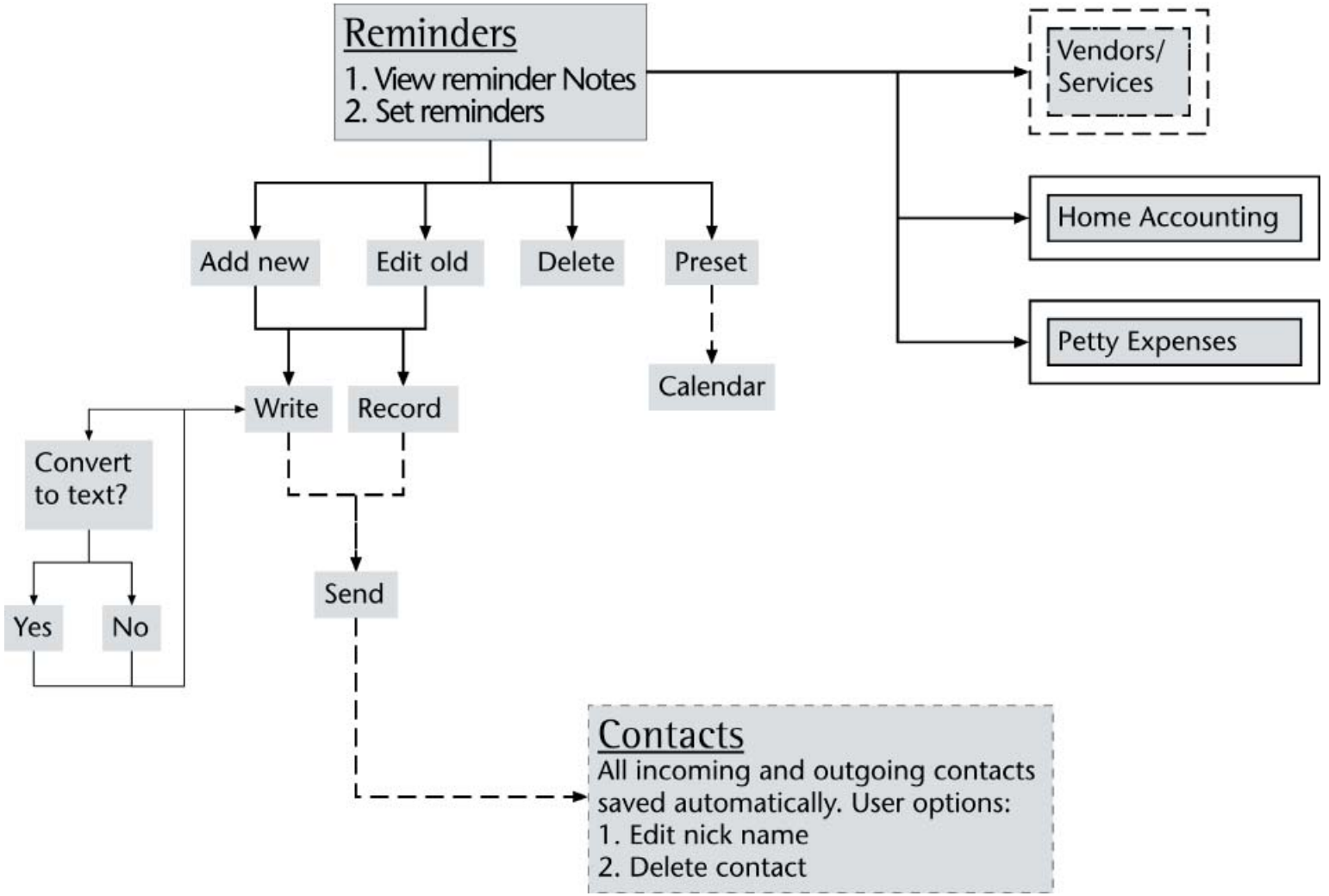
‘Yojak’- a home computer

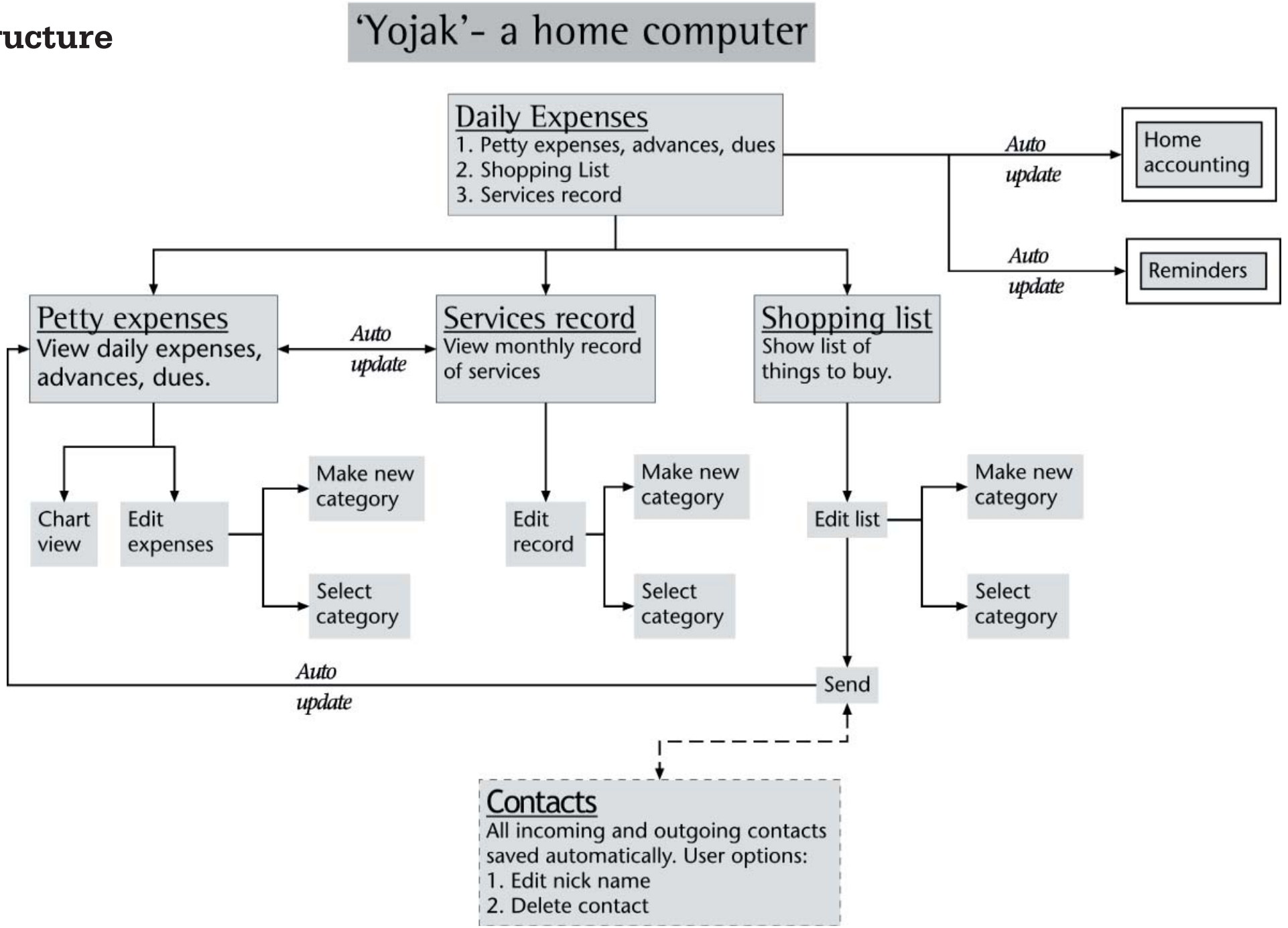


'Yojak'- a home computer

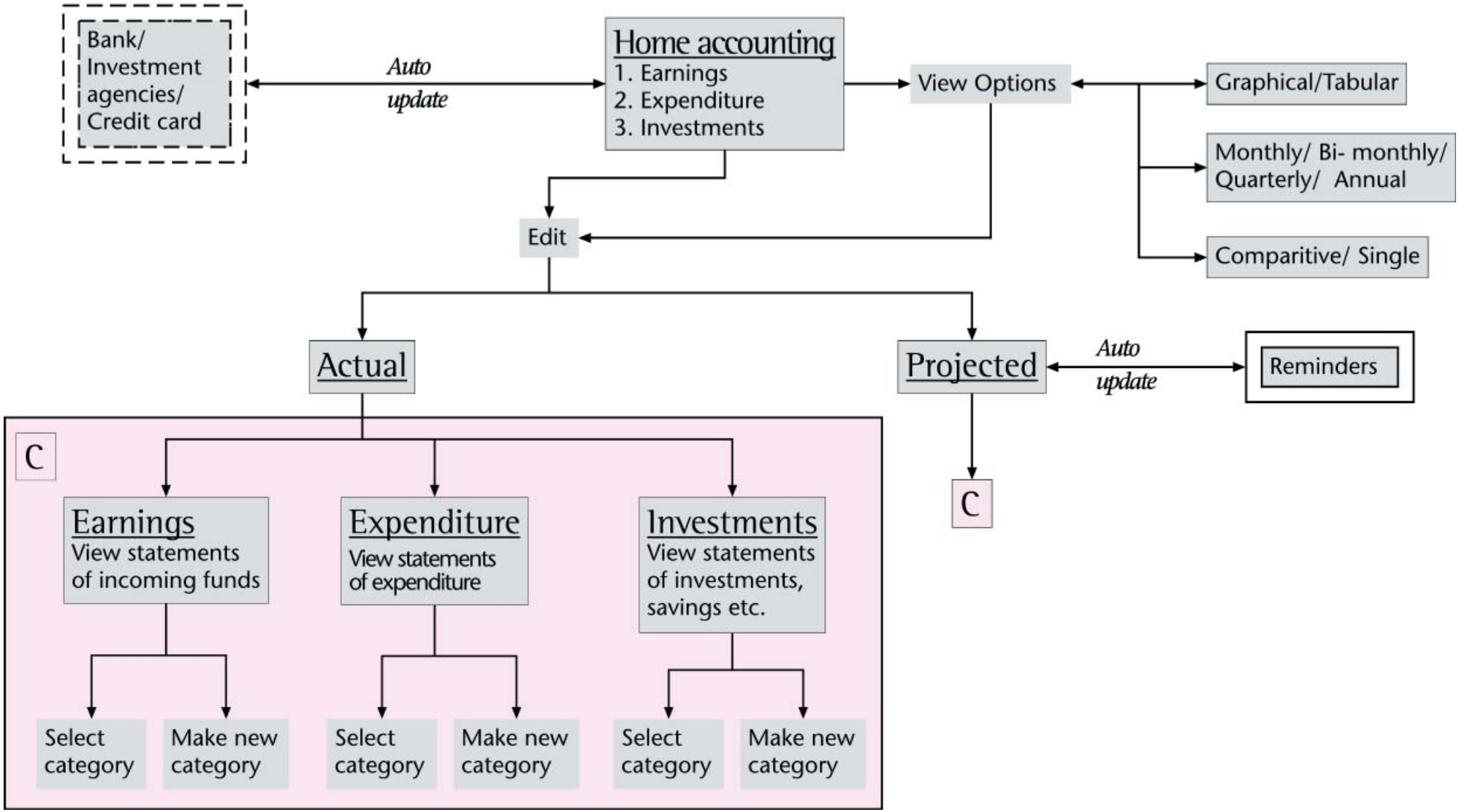


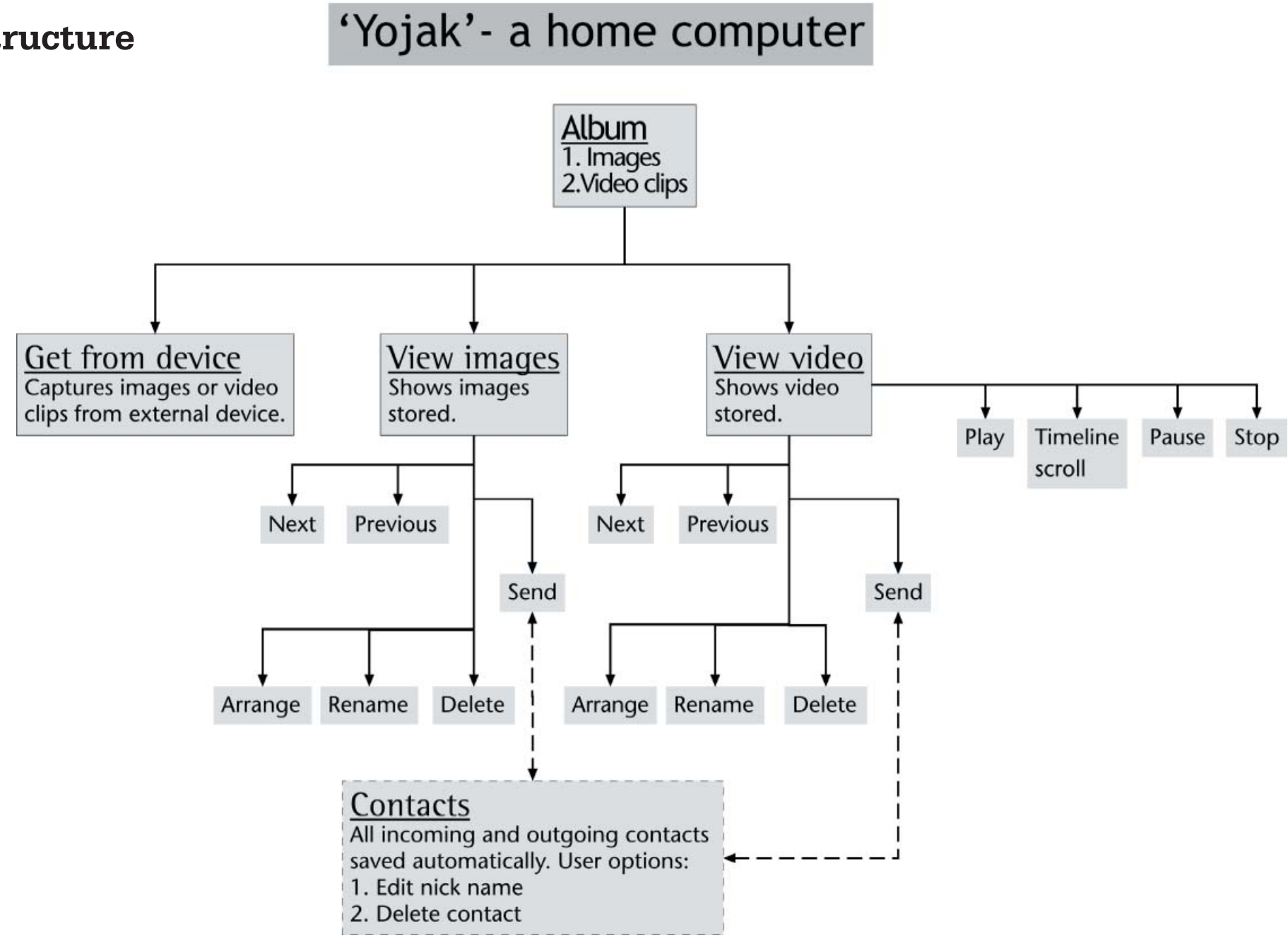
'Yojak'- a home computer



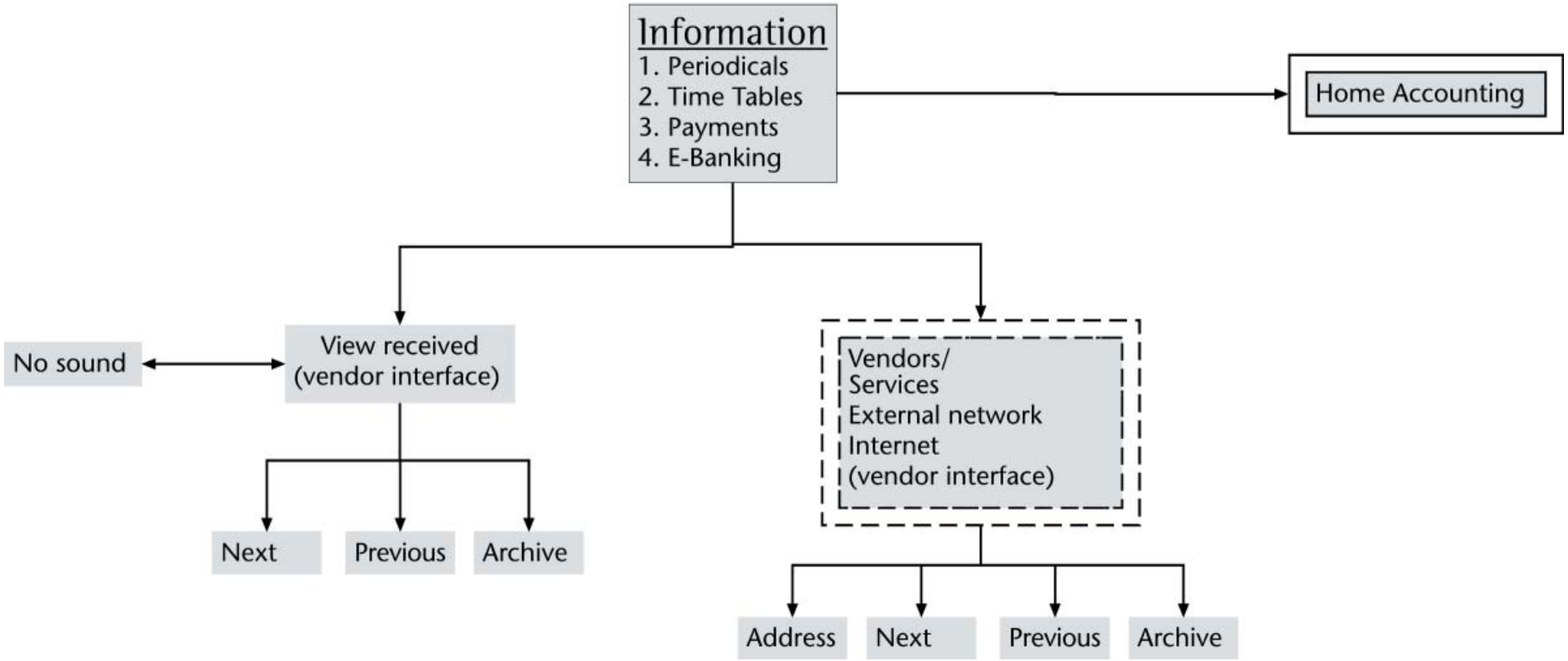

'Yojak'- a home computer
Daily Expenses
1. Petty expenses, advances, dues
2. Shopping List
3. Services record
Auto update
Home accounting
Auto update
Reminders
Petty expenses
View daily expenses, advances, dues.
Auto update
Services record
View monthly record of services
Shopping list
Show list of things to buy.
Chart view
Edit expenses
Make new category
Select category
Edit record
Make new category
Select category
Edit list
Make new category
Select category
Auto update
Send
Contacts
All incoming and outgoing contacts saved automatically. User options:
1. Edit nick name
2. Delete contact

'Yojak'- a home computer



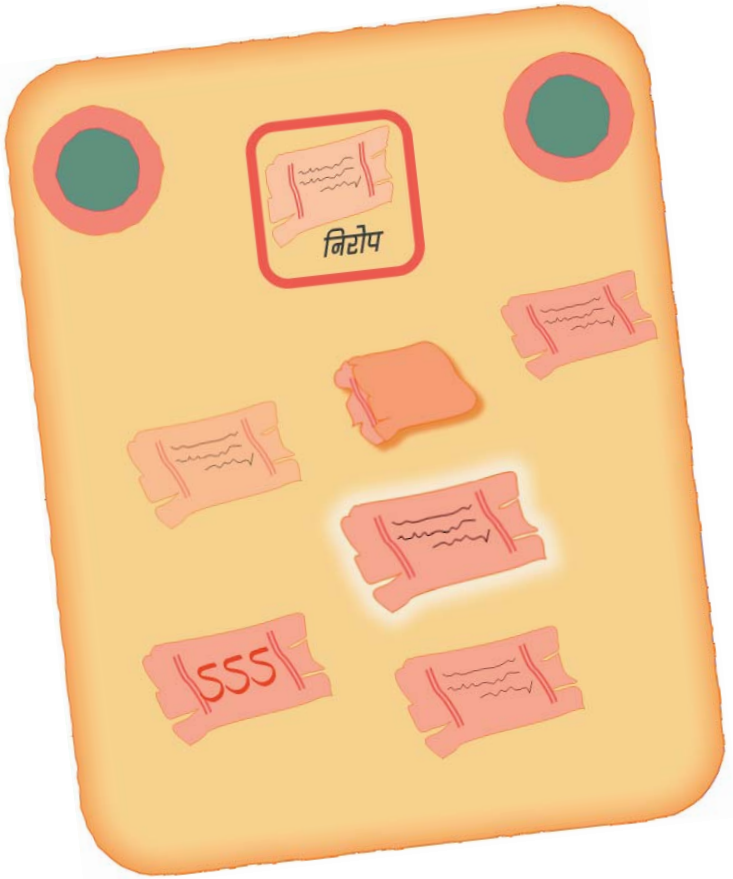

'Yojak'- a home computer
Album
1. Images
2.Video clips
Get from device
Captures images or video clips from external device.
View images
Shows images stored.
View video
Shows video stored.
Play
Timeline scroll
Pause
Stop
Next
Previous
Send
Arrange
Rename
Delete
Next
Previous
Send
Arrange
Rename
Delete
Contacts
All incoming and outgoing contacts saved automatically. User options:
1. Edit nick name
2. Delete contact

'Yojak'- a home computer



visual design

Alternative concepts for visual design of interfaces



final screens

final screens

final screens

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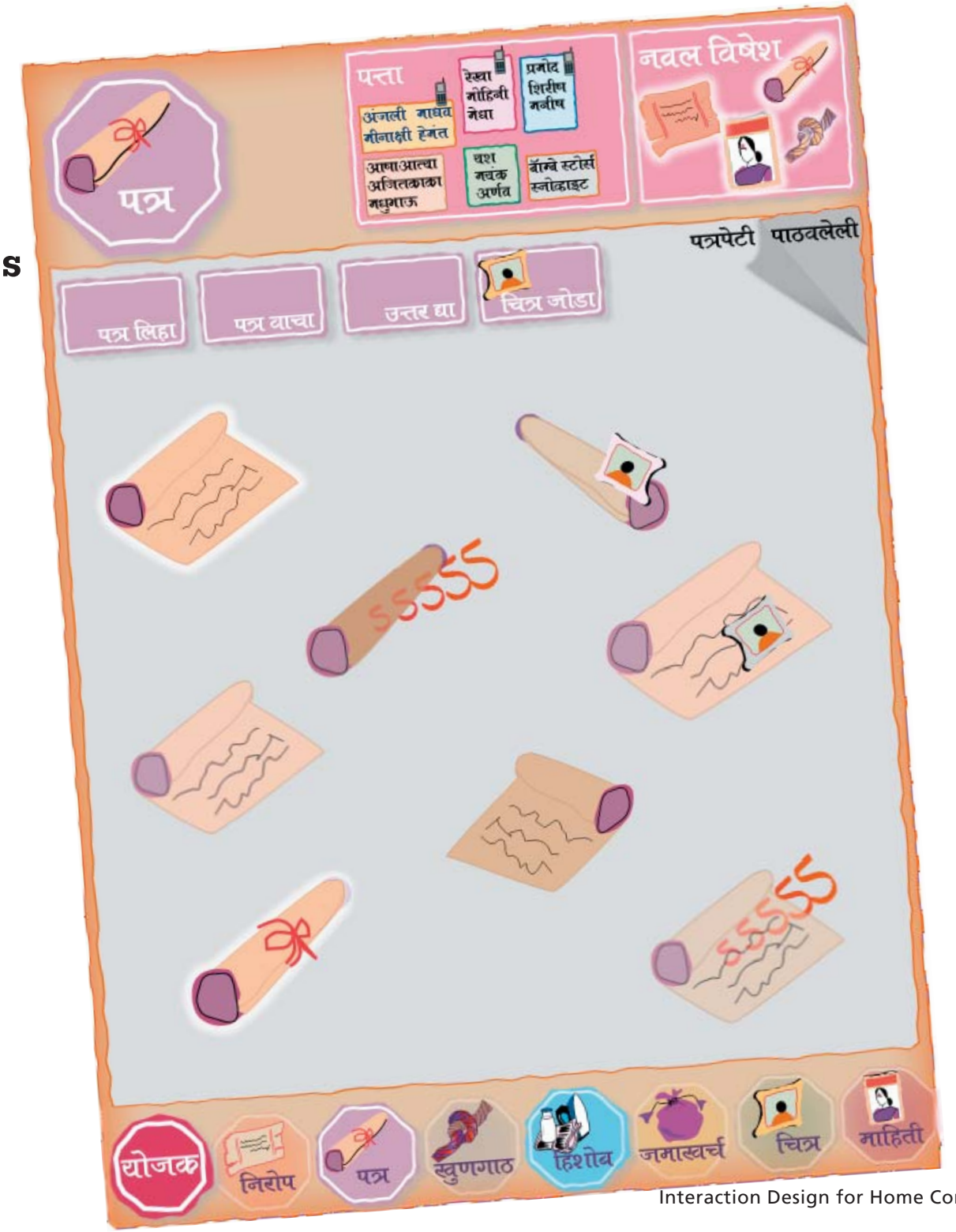
final screens



final screens

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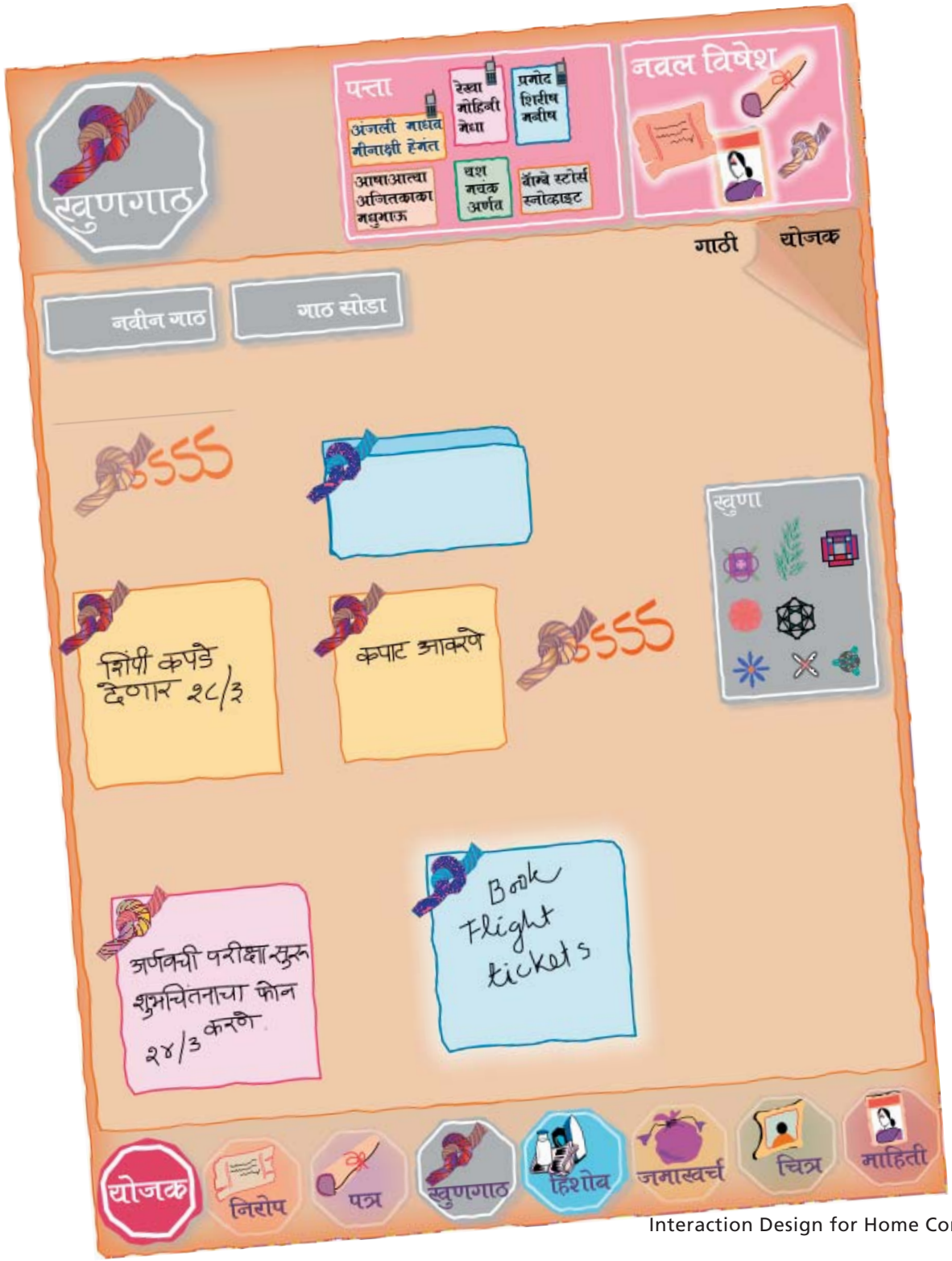
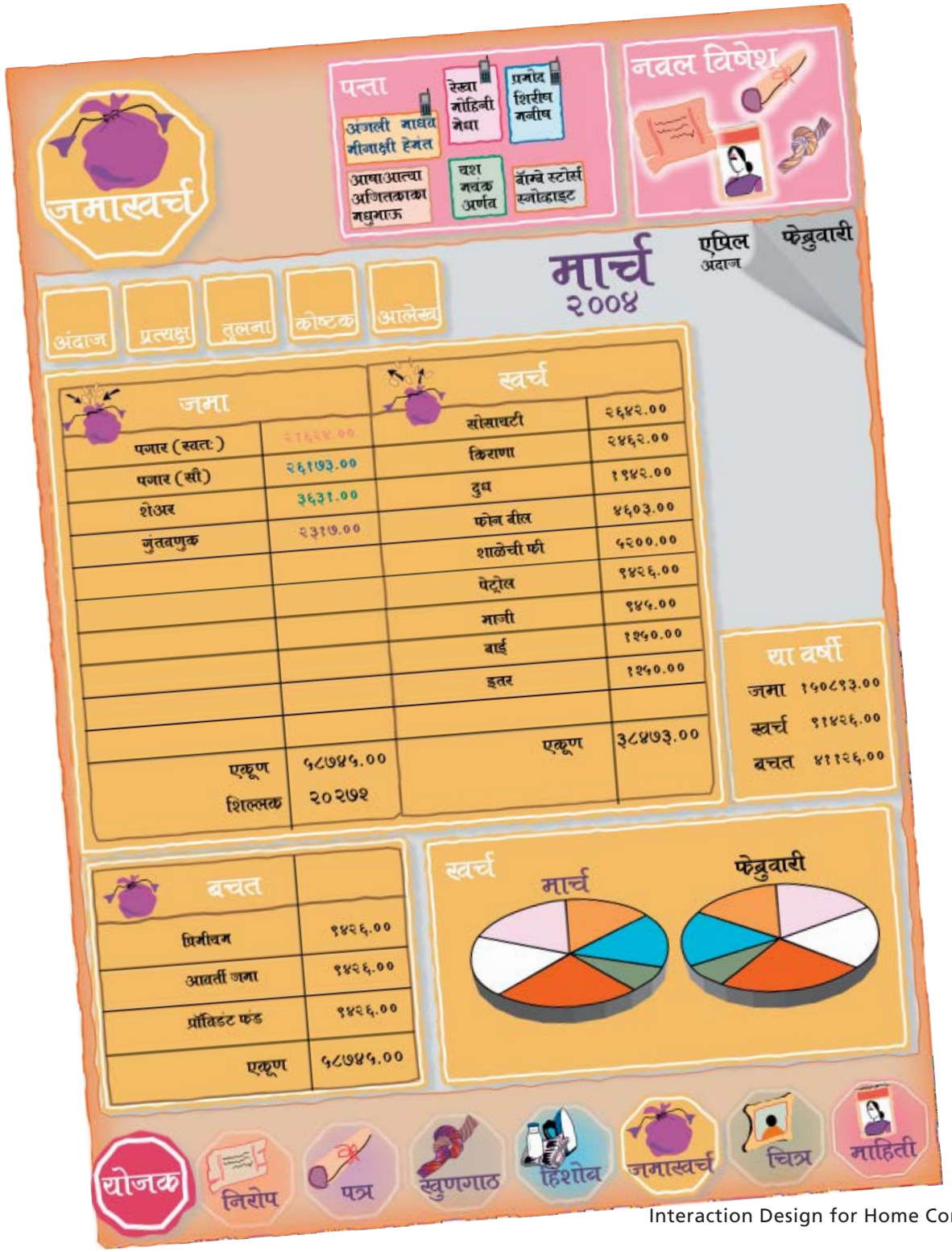


final screens

final screens



final screens

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