

Human Computer Interaction

CS449 – CS549

Week 13

Software Engineering Methodologies

User-Centered Design.

KÜRSAT ÇAĞILTAY

Today – Revisiting CS 308 SW Engineering

- Software Engineering Methodologies and HCI
- User-Centered Design

Reminder: Term Projects

- If you get my approval for your project topic, please add it to the form

CS449_549 Term Project Groups

Dont forget to do Course evaluations

Importance of User Interface

- “Most important part of any computer system”
 - “Interface *is* the system for most users”
- Increasingly important
 - ~50% of code devoted to interaction/interface
- Interface should “disappear” – users can focus on **their task**, not the interface
- Biggest enemy of good interaction design is time

Benefits of Good Design

- Small improvements can be worth big \$\$\$
 - IBM - \$1 invested in usability returns \$10-\$100
- Interface problems are treated as bugs
 - \$1 fix during design, \$10 fix during development, \$100 fix after release
- Long lived system maintenance costs can exceed all other costs by 4:1

HCI's goals

- Week-1
 - HCI studies interaction in order to influence the design of more humanly acceptable systems
- Software design vs. System design
- General push towards user-centered design

CS308 - What is software engineering?

- The process of **solving**
 - **customers'** problems by
 - the **systematic** development and evolution of
 - high-quality software systems
 - within cost, time and other **constraints**

CS308- What is software engineering?

- Solving **customers'** problems
 - This is the goal of software engineering
 - Adding unnecessary features does not help solve the problem
 - Software engineers must **communicate effectively** to identify and understand the problem
- So, **User Centered Design**

Product and Process Paradigms in Systems Development

- 1. Product-oriented perspective:** software as a product, set of programs. Product can be fixed and software requirements determined in advance – User is the User
- 2. Process-oriented perspective:** software in the context of human learning, work and communication. Change is the norm. User is the Boss



How the customer explained it



How the Project Leader understood it



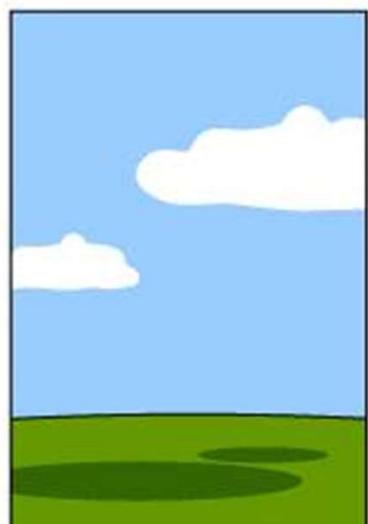
How the Analyst designed it



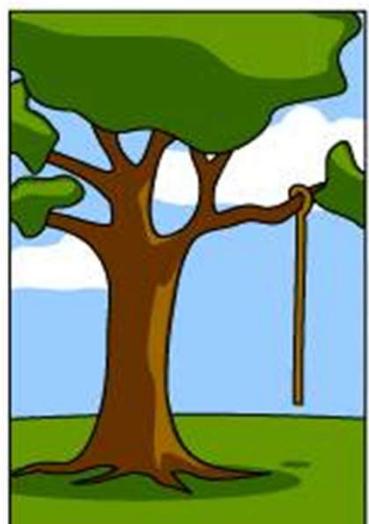
How the Programmer wrote it



How the Business Consultant described it



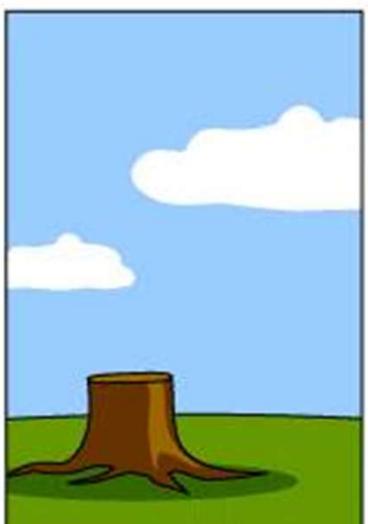
How the project was documented



What operations installed



How the customer was billed



How it was supported



What the customer really needed

SW Development Methodologies

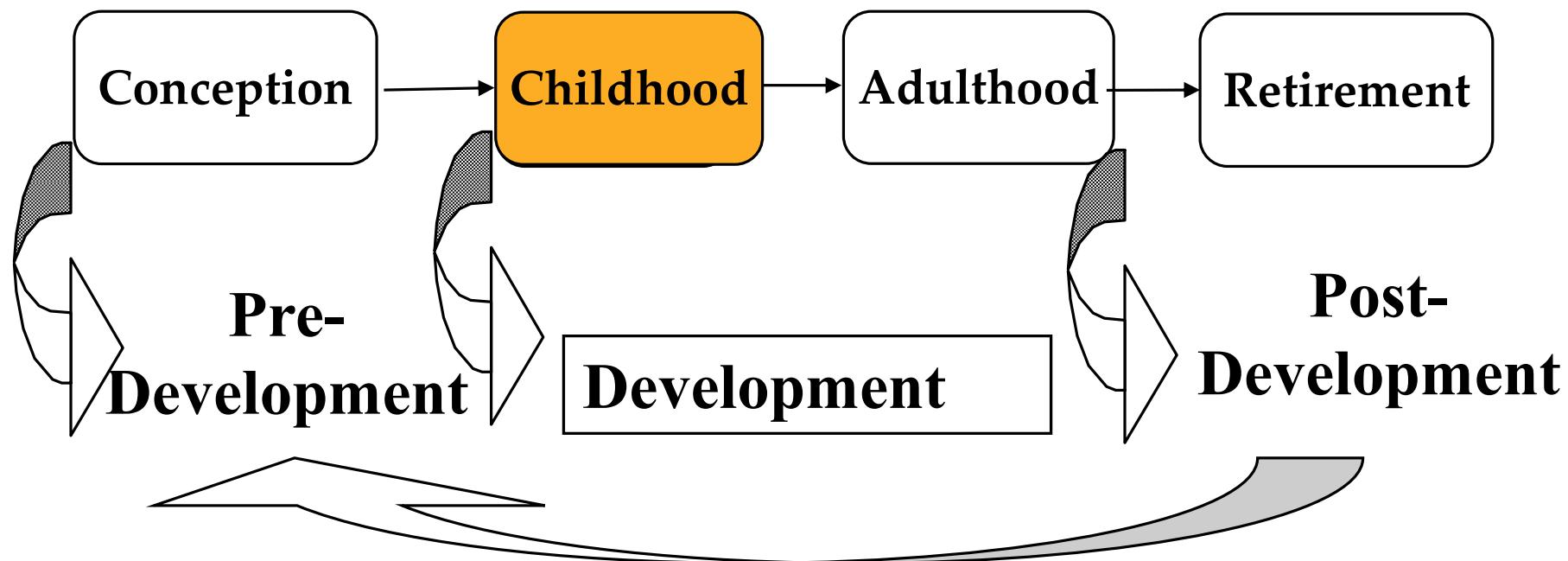
- Why do we need methodologies?
- Which methodology do you use?
- Can't we design and develop a system without a methodology?

SW Development Methodologies

- A methodology is a collection of tools and techniques to make system development more systematic
- Methodology defines a process by which a system can be built
- Defined by the artefacts required to be produced - models, documents, plans etc.
- Like a language or map

Software Life Cycle

- The term “Lifecycle” is based on the metaphor of the life of a person:

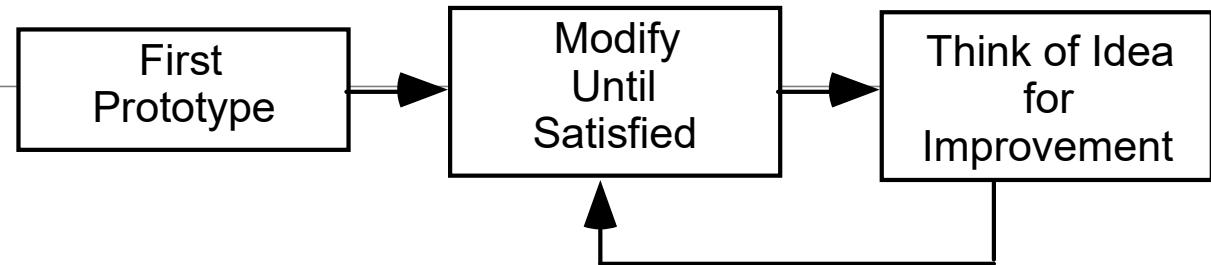


SW Development Methodologies

- Pre methodologies - Opportunistic Approach
- The waterfall model
- Improvements to waterfall model
- New methodology themes and methodologies
- User centered design

Pre Methodologies - Opportunistic Approach

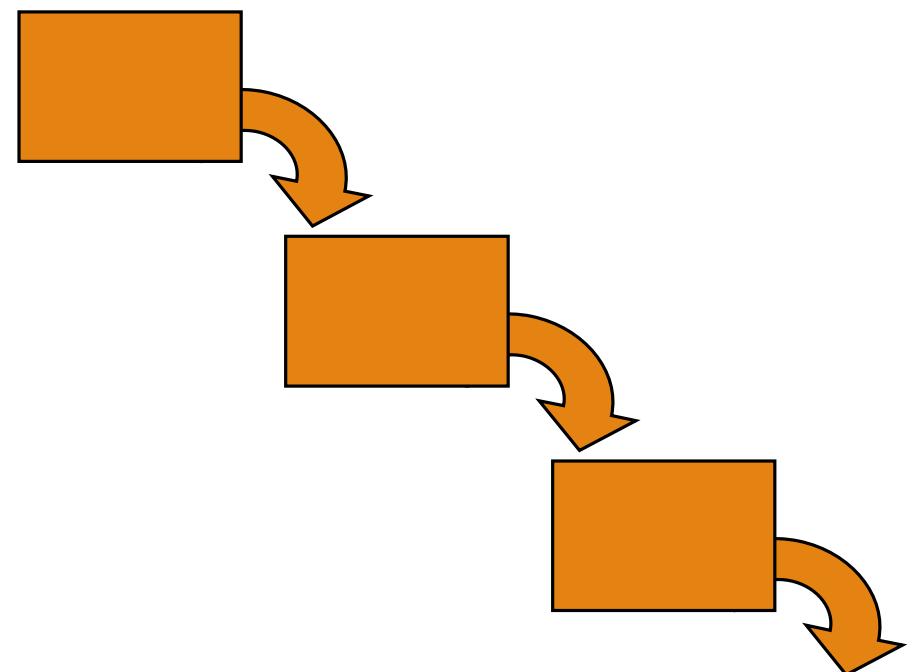
- Rule of thumb
- Experience
- No documentation
- No standards
- Poor training opportunities
- e.g. your first Web page



The Waterfall Model (or Systems Development Life Cycle-SDLC)

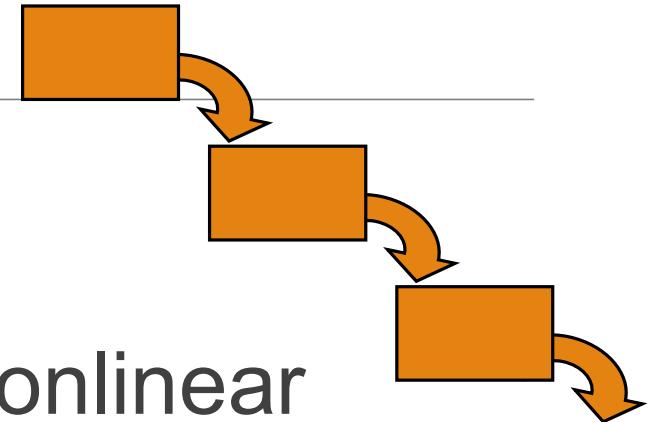
Introduced in 1960s

- Project defn.
- Feasibility study
- Systems Investigation
- Systems analysis
- Requirement analysis
- Systems design
- Systems development
- Implementation, Testing
- Review and maintenance

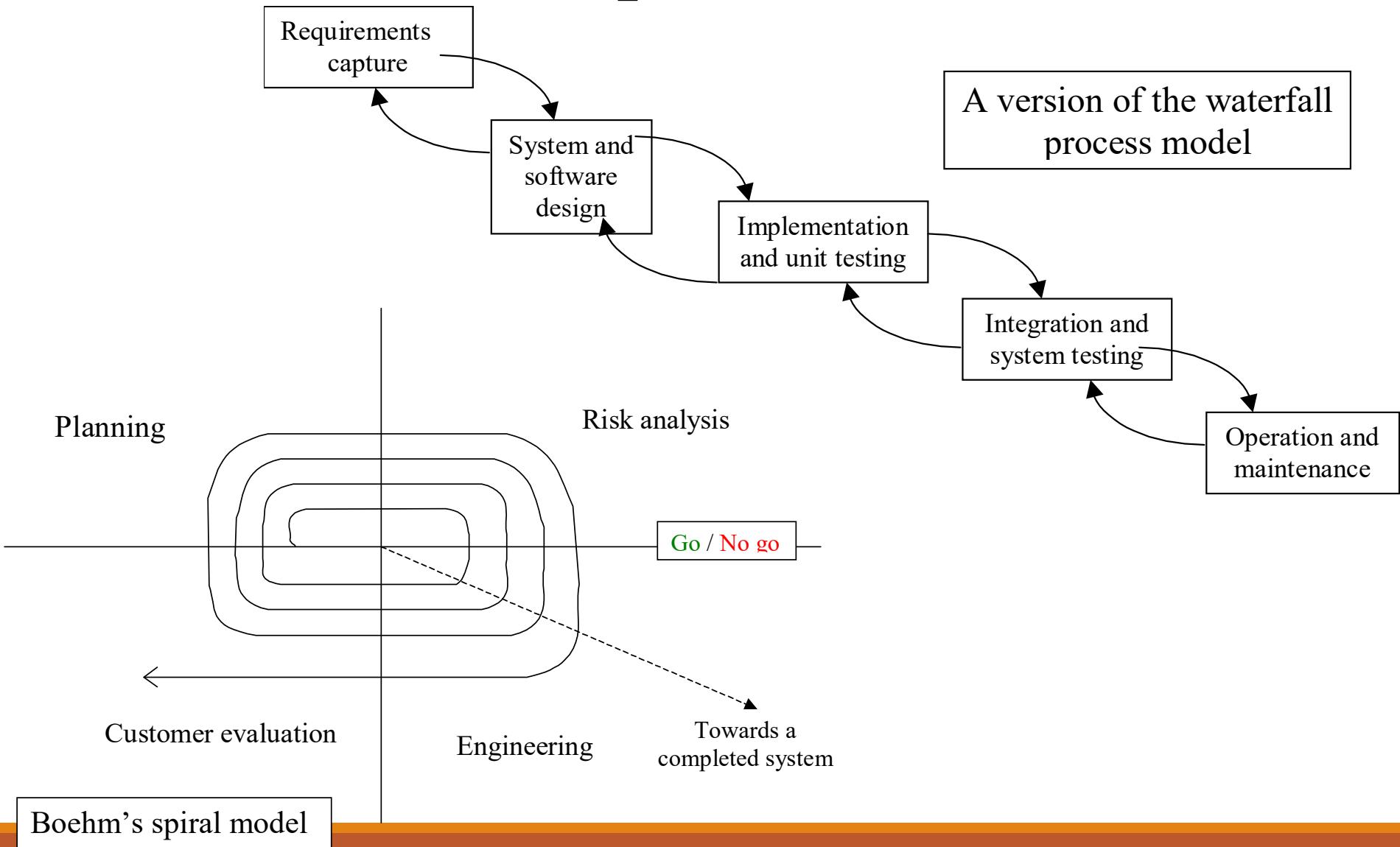


Properties of Waterfall -based Models

- Managers love waterfall models:
 - Nice milestones - linear system
- However, software development is nonlinear
 - In design, problems with requirements are identified
 - In testing, coding, design and requirement errors are found
 - User dissatisfaction
 - Maintenance workload



Improvements to SDLC



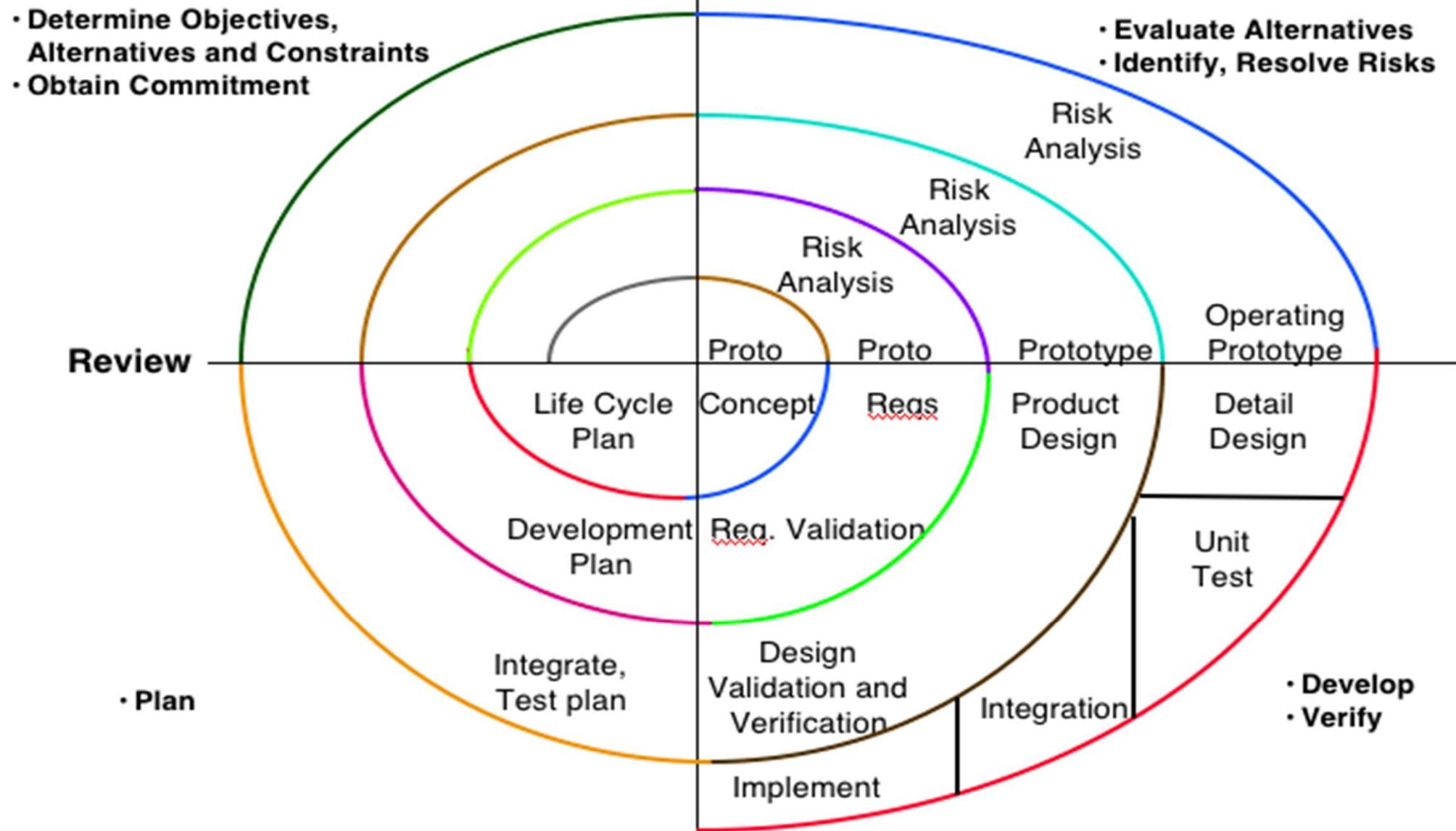
Boehm's spiral model

- Risk driven (rather than a primarily document-driven or code-driven process)
- Incorporates existing models

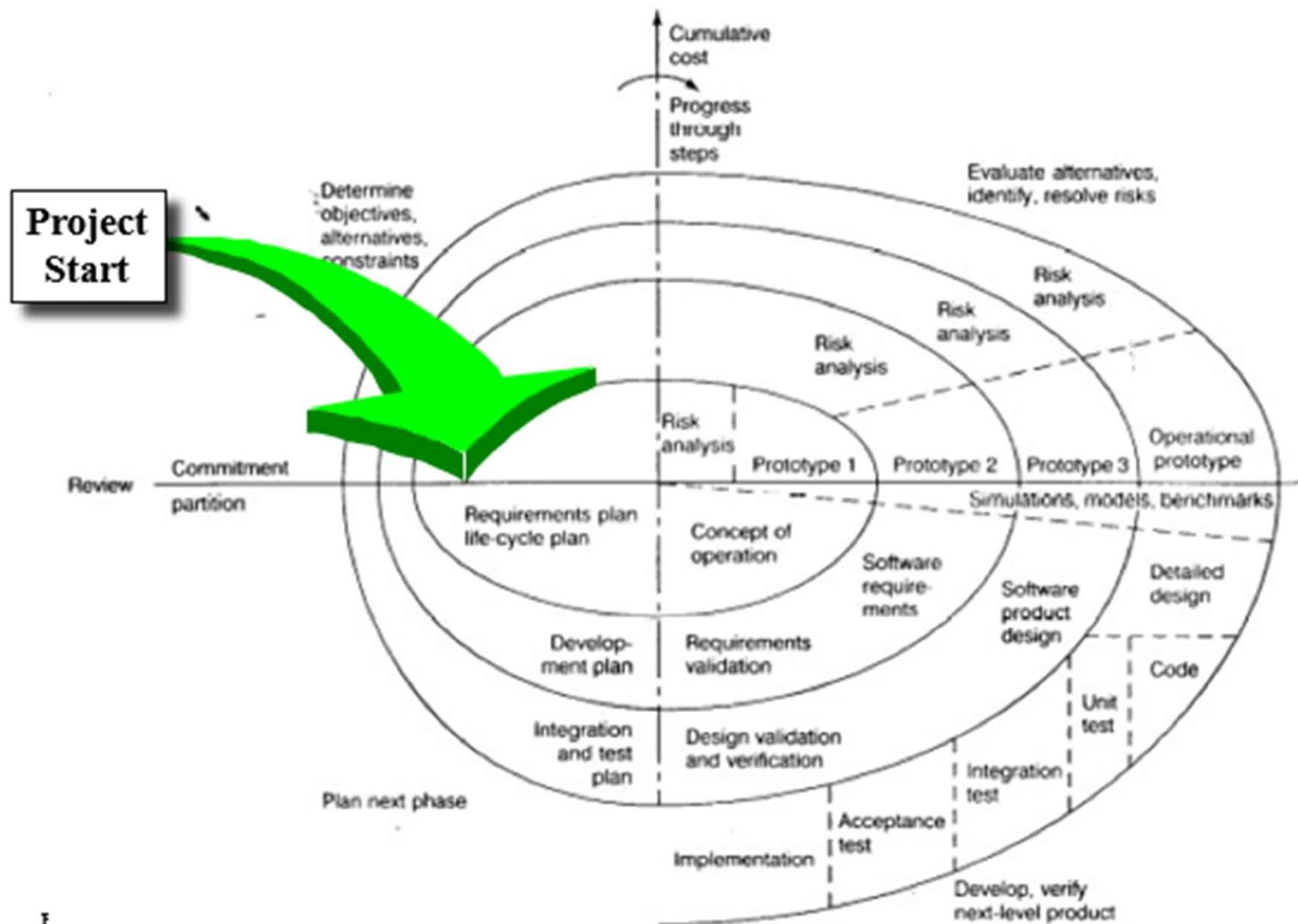
Boehm's top 10 risks

- Develop wrong user-interface
- Continuous stream of requirement changes
- Performance shortfall
- Personal shortfall
- Unrealistic schedule, budget
- Develop wrong functions
- Gold plating – Making something perfect but unnecessary
- Shortfall in external components
- Shortfall in external tasks
- Straining computer science capabilities

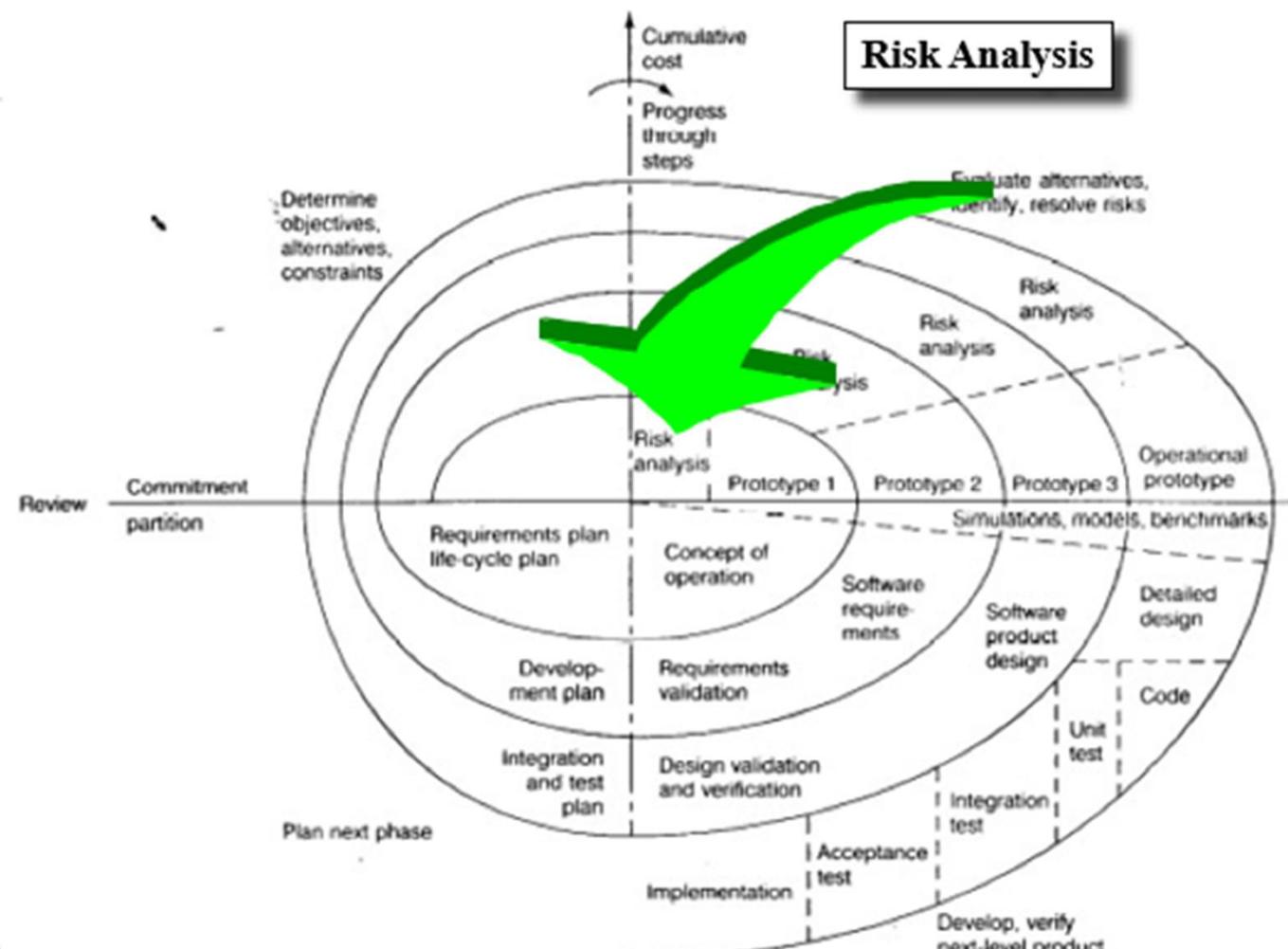
Boehm's Spiral Model



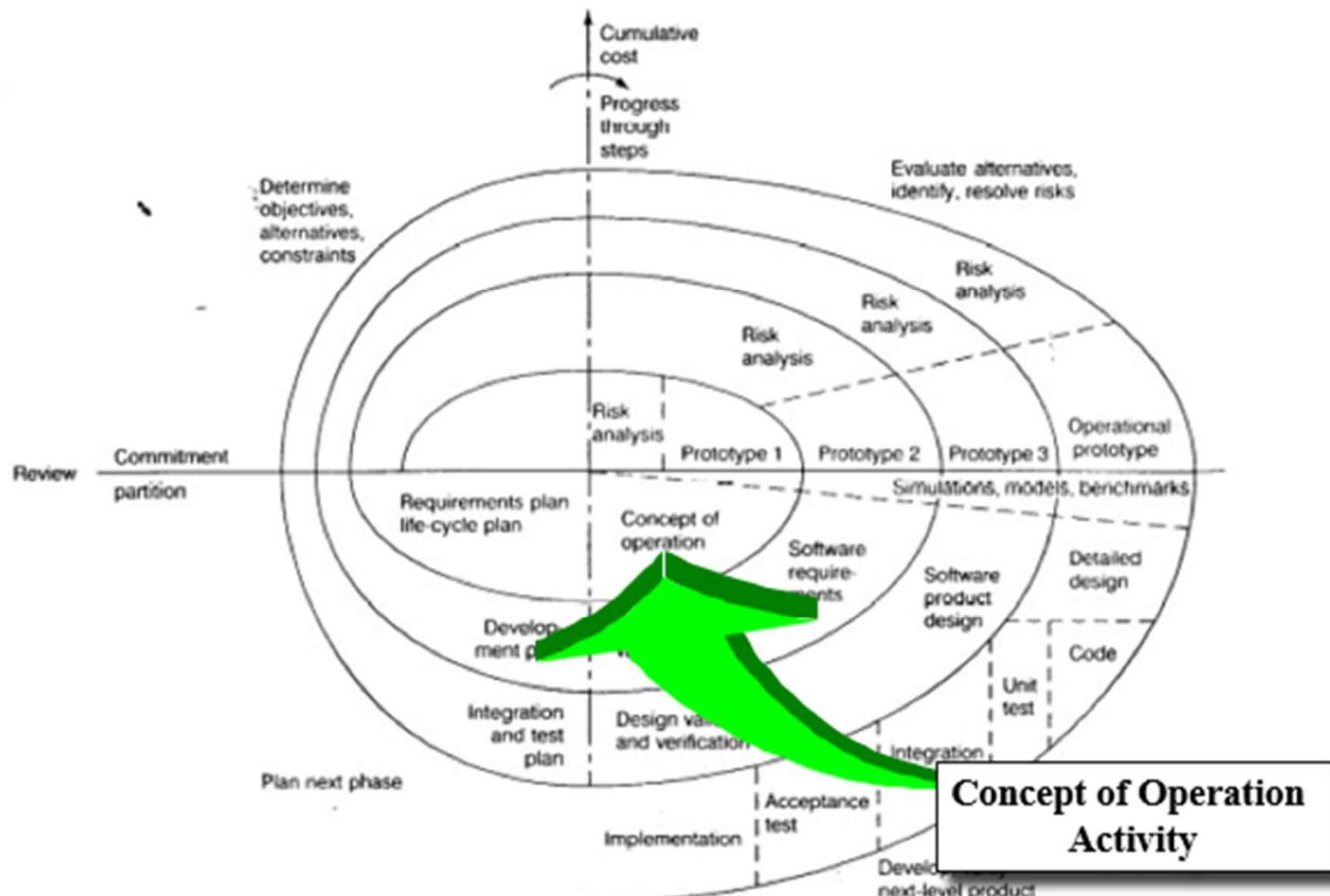
Round 1, Concept of Operations, Quadrant IV: Determine Objectives, Alternatives & Constraints



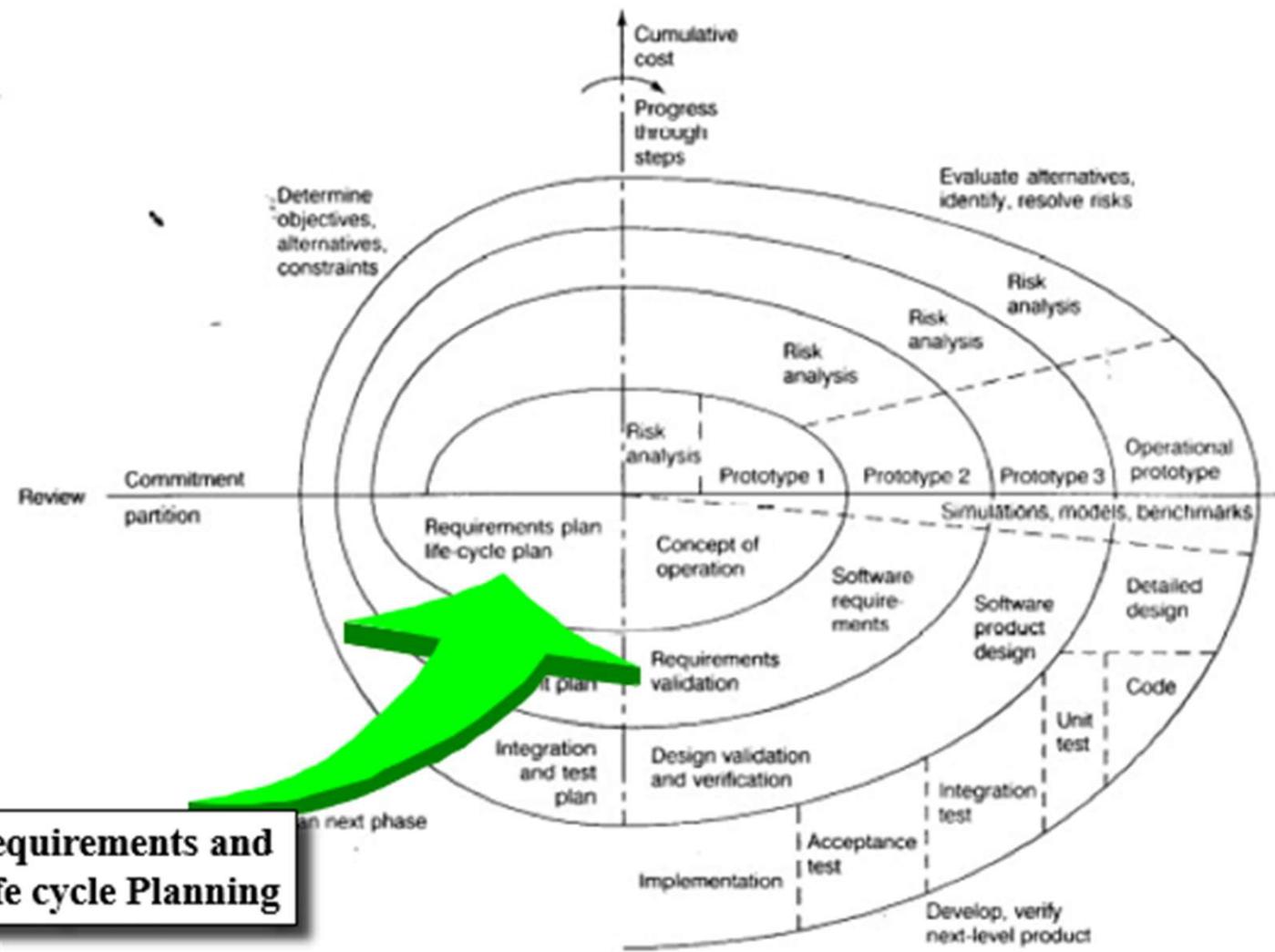
Round 1, Concept of Operations, Quadrant I: Evaluate Alternatives, identify & resolve Risks



Round 1, Concept of Operations, Quadrant II: Develop and Verify



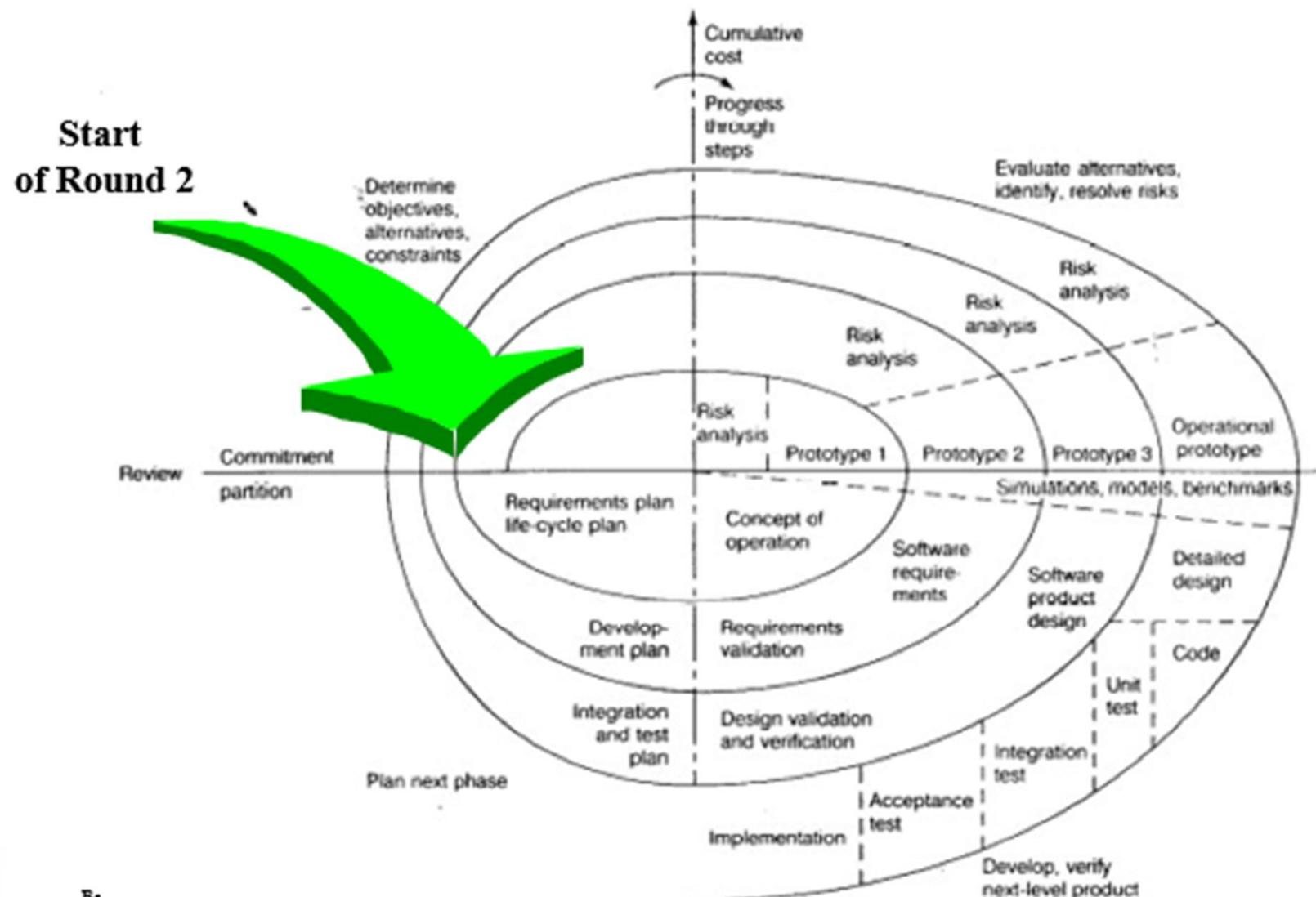
Round 1, Concept of Operations, Quadrant III: Prepare for Next Activity



**Requirements and
Life cycle Planning**

B1

Round 2, Software Requirements, Quadrant IV: Determine Objectives, Alternatives & Constraints



User Centered Methods: Agile Approach

- Agile Manifesto - Value:

Individuals and interactions over processes and tools

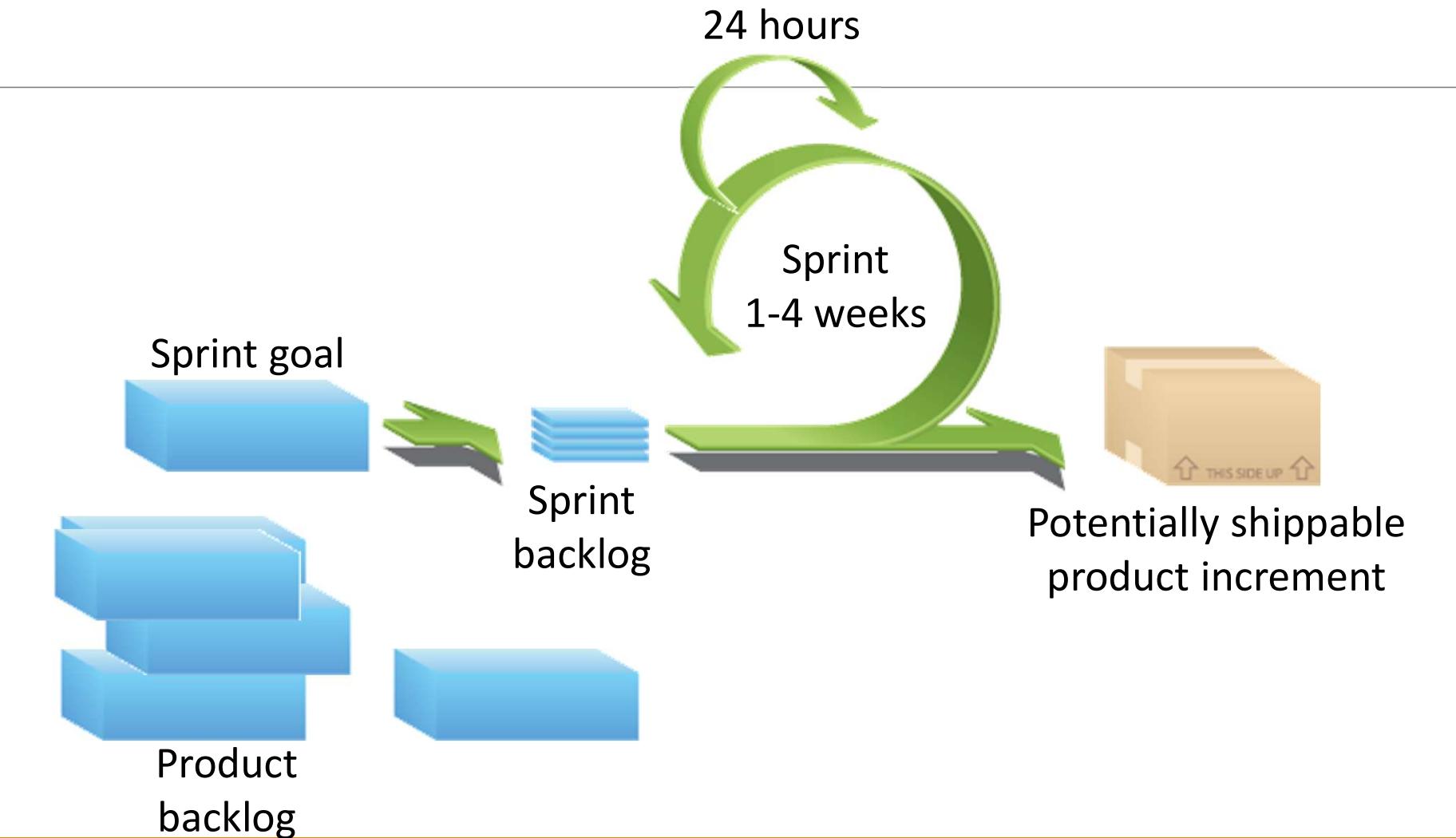
Working software over comprehensive documentation

Customer collaboration over contract negotiation

Responding to change over following a plan

- That is, while there is value in the items on the right, we value the items on the left more.

Agile Methodology: Scrum

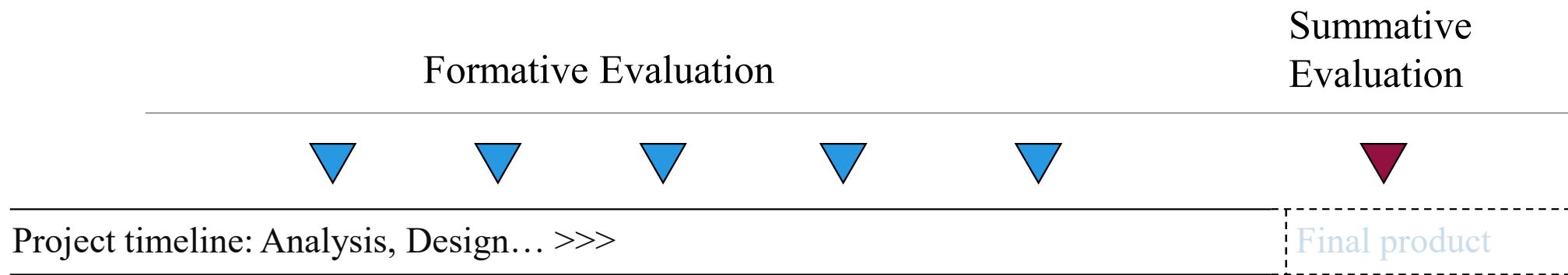


The daily scrum

- Parameters
 - Daily
 - 15-minutes
 - Stand-up
- Not for problem solving
 - Whole world is invited
- Helps avoid other unnecessary meetings

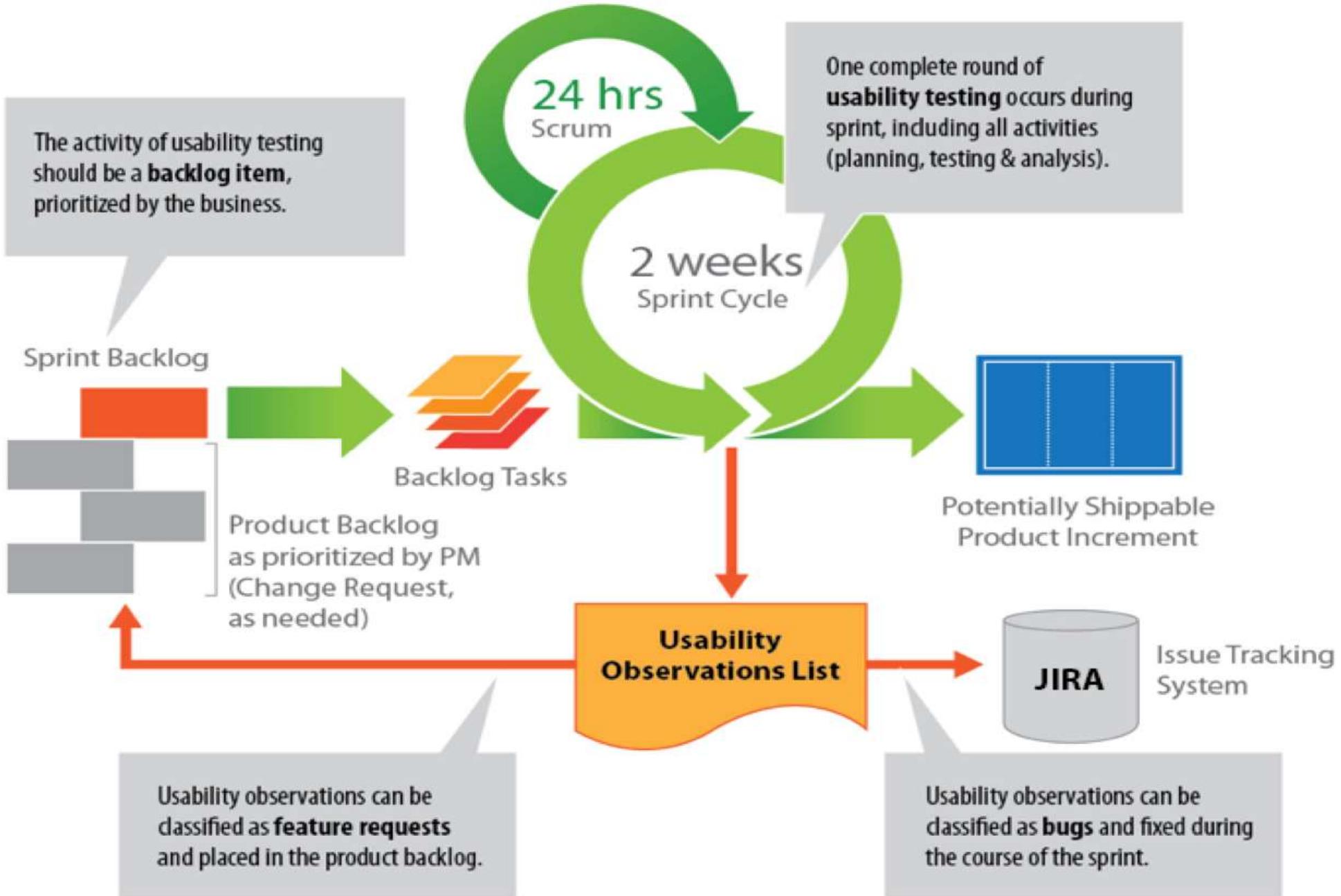


Usability in SW Lifecycle



- “how are we doing?”
- goal is to improve the product
- informs the design process
- early and often
- participants are **authentic** users
- participants perform **authentic** tasks
- **observe** and **record** what people say and do
- **analyze** data, **diagnose** problems and make recommendations

- “how did we do?”
- validate the product
- occurs after release



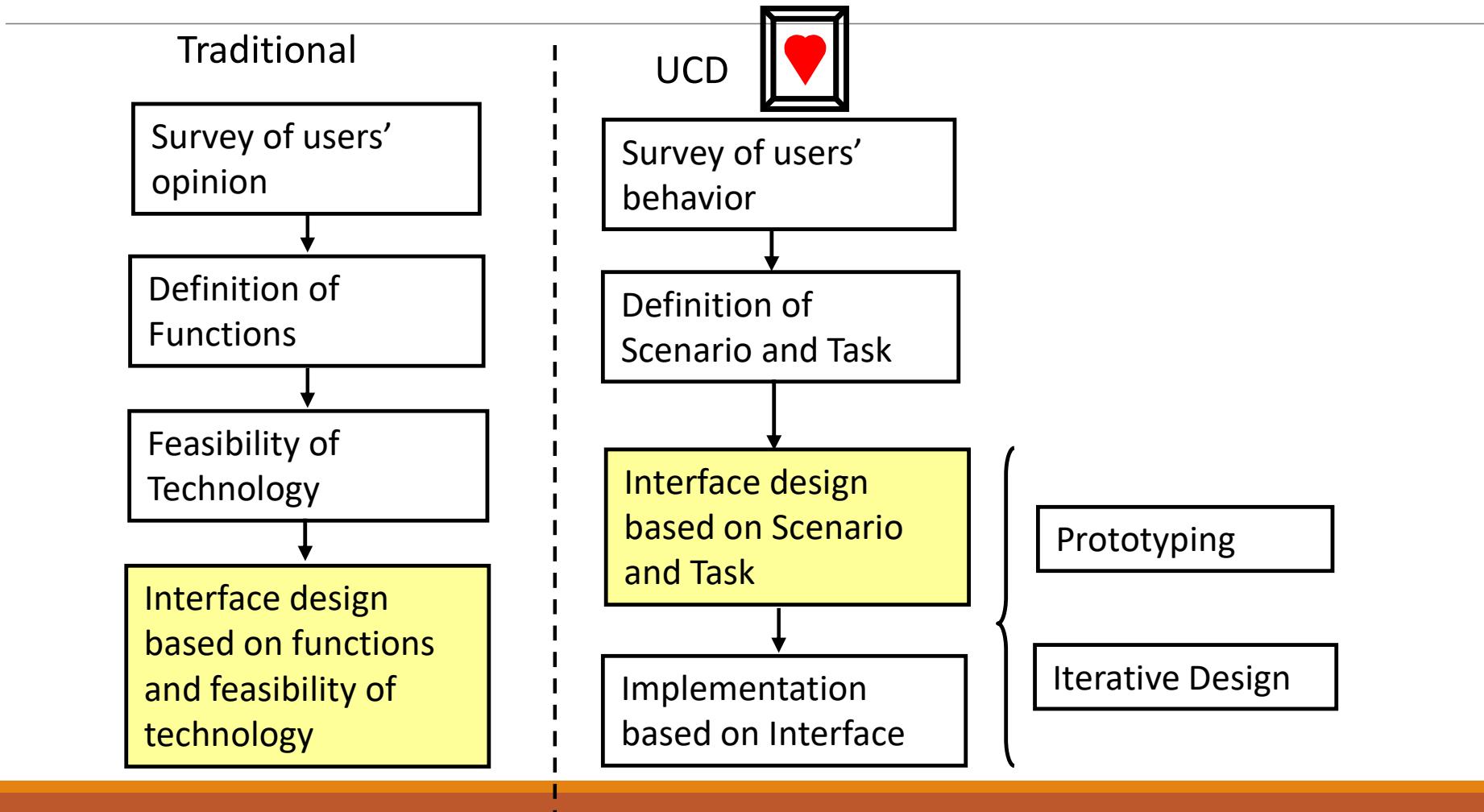
SCRUM and Usability

Feature / Aspect	Scrum	Usability
Iterative Development	Short, time-boxed iterations (sprints)	Iterative design process
User-Centered Focus	User stories define product features	Emphasis on user needs and preferences (Personas)
Cross-Functional Teams	Diverse skill sets in one team	Collaboration of designers, developers, and usability specialists in teams
User Stories	Short descriptions from an end-user perspective	Focus on user needs and expectations (Personas)

SCRUM and Usability

Feature / Aspect	Scrum	Usability
Definition of Done (DoD)	Criteria for completing a user story	usability criteria for completeness (E-E-S)
User Involvement	Regular interaction with stakeholders	Involves users through testing and feedback sessions
Sprint Review	Stakeholders provide feedback on the increment of work	Incorporates usability testing results and user feedback
Continuous Improvement	Regular retrospectives for process improvement	Iterative refinement for an enhanced user experience
Usability Backlog	Prioritizes usability-related tasks alongside the product backlog	Tracks and prioritizes usability improvements

From Traditional software development to User/human-centered development



What is User Centered Design

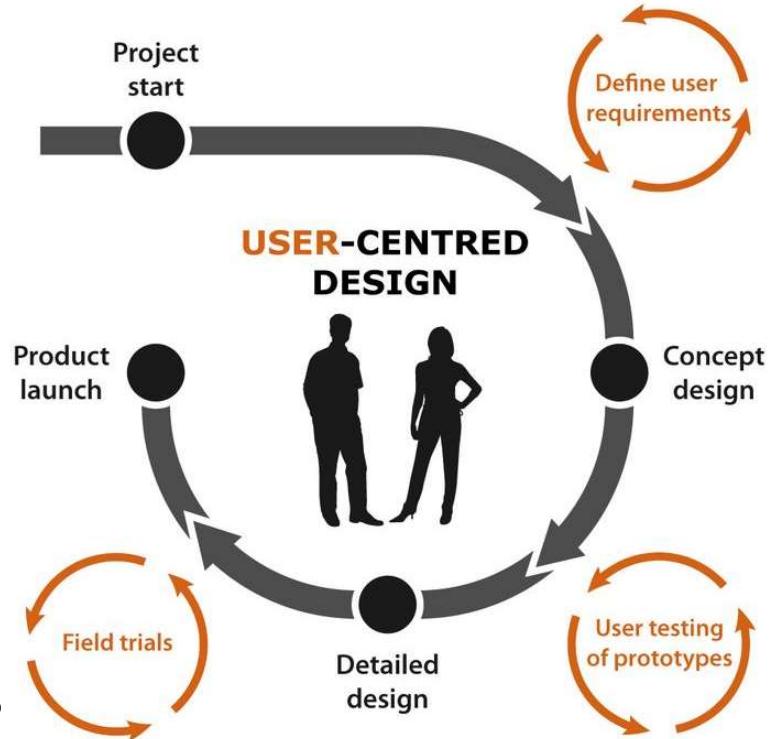
- An approach to design based on social and cognitive analysis of human activities
- focus more on design than implementation of user interfaces
- the user is involved in the design process
- Other terms: Collaborative design, Participatory design

Steve Jobs and User Centered Design



What's Special?

- Design test iterations
 - As opposed to phased-stage testing
- Early and continuous focus on users
 - What do users require?
 - How do users work?
- Operationalizing usability testing-Iterations
- Testing as often as needed



Common shortfalls

- Using designers as test subjects
- Avoiding task analysis
- Rationalizing test findings
- Taking test results as a personal attack

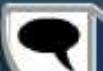
How?

- Scenarios
 - Discussions, paper prototypes, survey
- Reality check
 - Present conclusions to participants
- Establish criteria for agreement
 - Usability definition may vary
- Test, test, test

A Real Life Case for UCD

- Designing for kids with kids.....
- How do you design a software (e.g. Electronic Dictionary) for kids?

A B C Ç D E F G Ğ H I İ J K L M N O Ö P R S Ş T U Ü V Y Z



a, A
aba
abajur
abaküs
abandone
abanmak
abanoz
abarti
abartma
abartmak
Abaza
Abdal
abdal
abdest
abdestbozan
abdestbozan otu
abdesthane
abece
abes
abihayat
abide
abideleşme
abideleşmek
abis

a, A

1. Türk alfabetesinin birinci harfi.
2. Şaşma, hatırlama, sevinme, acıma, üzülme, dikkat çekme, kızma gibi duyguları anlatır. ör: A, *dün kardeşimin doğum günüydü; unuttum!*
A'dan Z'ye kadar: Baştan aşağı, bütünüyle.



filtre

filtreyi kaldır

açıklamalar



imlâ kılavuzu



Participatory design ...











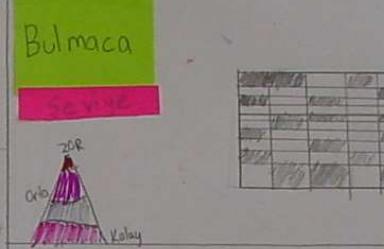
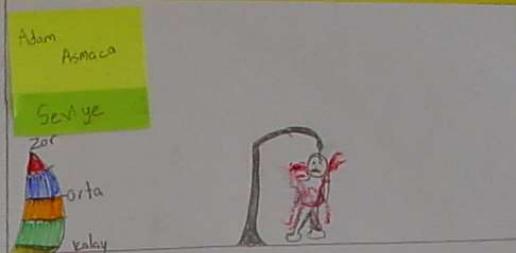
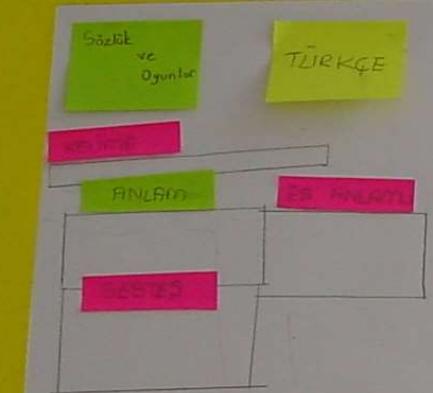








Output



**SPOR
YARIŞ
ZEKA**



Burak ve Kemal

ONIC

All the words are
HERE!

Üyelik



e-mail

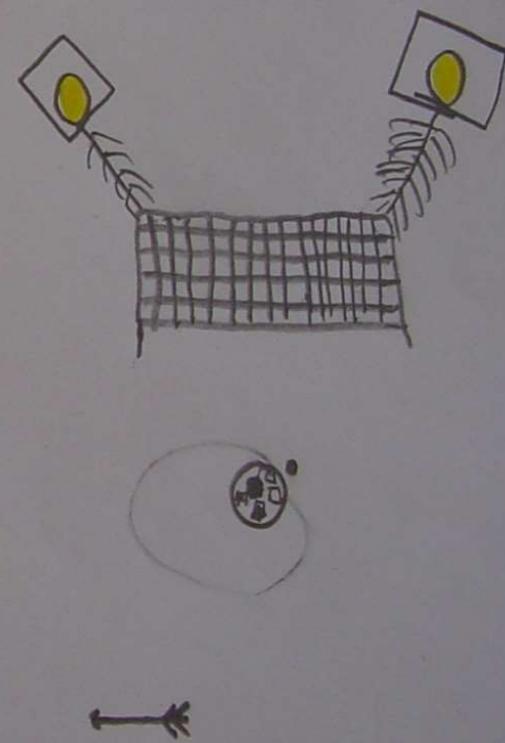
Games

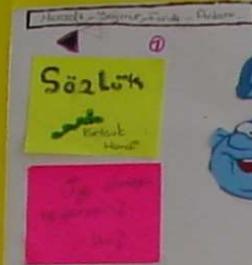
- 1-X-Man
- 2-Batman
- 3-Zor Hedef
- 4-Hamuradam
- 5-Geber Patron
- 6-Otobon
- 7-Top Saydırma
- 8-Fonus
- 9-Magmazone
- 10-Broomstick
- 11-Yaya ezmeyece
- 12-Peralti atış!



Games

- 1 - X-Man
- 2 - Batman
- 3 - Zor Hedef
- 4 - Hamuradam
- 5 - Geber Patron
- 6 - Otoban
- 7 - Top Saydırma
- 8 - Fanus
- 9 - Magmazone
- 10 - Broomstick
- 11 - Maya ezmecə
- 12 - Penaltı atışı





Kids World



Sözcüklerin



D önyölesi

Yani
-Sözlükler-



Hoydi Oyun
Oynayalım

iandekler

Sözcüğün
anlamları.

Deyim anlamları.

Eğlenceli
oyunlar.

Ö	A
P	B
R	C
S	F
T	E
U	F
Ü	G
V	G
Y	H
Z	I
	J
	K
	L
	M
	N
	O



Üyelik

Sözlük (Türkçe)

Dictionary

Oyunlar

Kids mail

Yardımcı

Boyma

Gecik haberler



Final Product

File Edit View Favorites Tools Help



Address <http://www.dagarcik.com/>



en iyi 3

- 1.şefik inanç
- 2.bade inanç
- 3.İlke Şevli

dağarcık



Beni nasıl
besleyeceğini
biliyor musun?



sözlük

ara

Üye girişi

Kullanıcı adı:

Sifre:

Giriş

Şifremi Unuttum
Yeni Üye Kayıt

[Ana sayfa](#) | [Sözlüğüm](#) | [Haftanın Atasözü](#) | [Haftanın Deyimi](#) | [Dağarcık Kulübü](#)
[Oyun](#) | [Bulmaca](#) | [Okuyalım Öğrenelim](#) | [Resimli Öykü](#) | [Mesaj Panosu](#) | [Sohbet odası](#)

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en iyi 3 tıkla
1.şefik inanç
2.bade inanç
3.İlke Şevli

dağarcık

dağarcık kulubu oyun bulmaca okuyalım öğrenelim resimli öykü mesaj panosu

haftanın Atasözü Deyimi

sözlük ara

Üye girişi
Kullanıcı adı:
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sözlüğüm

Merhaba arkadaşlar!

Dağarcık kulübünde birbirinden güzel duvar kâğıtları, e-kartlar, ekran koruyucular, haftalık ders programları ve takvimler siz bekliyor.

Dağarcığa üyeSENİZ Üye Girişine; henüz üye DEĞİLSENİZ Yeni Üye Kayıt'a tıklayın, eğlenceye katılın!

[Üye girişi](#) [Yeni üye kayıt](#)

Ana sayfa | Sözlüğüm | Haftanın Atasözü | Haftanın Deyimi | Dağarcık Kulübü
Oyun | Bulmaca | Okuyalım Öğrenelim | Resimli Öykü | Mesaj Panosu

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anasayfa

Internet

A screenshot of a Microsoft Internet Explorer window displaying the website <http://www.dagarcik.com/oyun.asp>. The page is titled "dağarcık" and features a cartoon character holding a speech bubble that says "sözlüğüm". The main content area shows a grid of nine game thumbnails. To the left, there are sections for "en iyi 3 tıkla" (top 3), "haftanın Atasözü" (Week's Proverb), "Deyimi" (Saying), "sözlük" (Dictionary), and user login fields. A bottom banner links to various site pages like "Ana sayfa", "Sözlüğüm", and "Oyun".

en iyi 3 tıkla

1.şefik inanç
2.bade inanç
3.İlke Şevli

haftanın Atasözü

Deyimi

sözlük

ara

Üye girişi

Kullanıcı adı:

Sifre:

Giriş

Şifremi Unuttum

Yeni Üye Kayıt

dağarcık kuluþu

oyun

bulmaca

okuyalim öðrenelim

resimli öykü

mesaj panosu

Oynamak istediğiniz oyunun üzerine tıklayınız.

Yukarıdaki oyunları oynayabilmek için Flash 6 Player'a ihtiyacınız vardır.
Flash 6 Player'ı indirmek için buraya tıklayınız.

Ana sayfa | Sözlüğüm | Haftanın Atasözü | Haftanın Deyimi | Dağarcık Kulübü
Oyun | Bulmaca | Okuyalim Öðrenelim | Resimli Öykü | Mesaj Panosu

anasya

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en iyi 3 tıkla
1.şefik inanç
2.bade inanç
3.İlke Şevli

dağarcık

sözlüğüm

dağarcık kulübü oyun bulmaca okuyalım öğrenelim resimli öykü mesaj panosu

Kare bulmaca

Bulmaca1 Bulmaca2 Bulmaca3

Sözcük avi

Piramit

Üye girişi
Kullanıcı adı:
Şifre:
Giriş
Şifremi Unuttum
Yeni Üye Kayıt

Ana sayfa | Sözlüğüm | Haftanın Atasözü | Haftanın Deyimi | Dağarcık Kulübü
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anasayfa

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Address http://www.dagarcik.com/resimli_oyku.asp

en iyi 3 tıkla

1.şefik inanç
2.bade inanç
3.İlke Şevli

dağarcık
kulübü

oyun

bulmaca

okuyalım
öğrenelim

resimli
öykü

mesaj
panosu

haftanın
Atasözü
Deyimi

sözlük

ara

Üye girişi

Kullanıcı adı:

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ÇAĞRI RÖVANŞ MAÇINDA

Resimli Öyküyü okumak için Resmin üzerine tıklayınız.

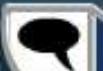
Ana sayfa | Sözlüğüm | Haftanın Atasözü | Haftanın Deyimi | Dağarcık Kulübü
Oyun | Bulmaca | Okuyalım Öğrenelim | Resimli Öykü | Mesaj Panosu

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aba
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abaküs
abandone
abanmak
abanoz
abarti
abartma
abartmak
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Abdal
abdal
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abide
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abis

a, A

1. Türk alfabetesinin birinci harfi.
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A'dan Z'ye kadar: Baştan aşağı, bütünüyle.



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filtreyi kaldır

açıklamalar



imlâ kılavuzu



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Course evaluations