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Dr. Hajj Yakhchali

Time and cost are negotiable



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رهنمود جامع النّا


دکتر سیامک حاجی یخچالی

عضو هیئت علمی دانشکده فنی دانشگاه تهران



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"Quality is more important than quantity. One horse run is much better than two shuffles."

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"Design is a funny word. Some people think design means how it looks. But it's really how it works."

Steve Jobs



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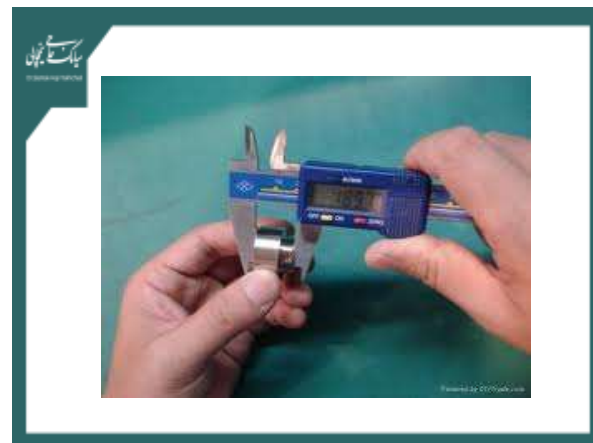
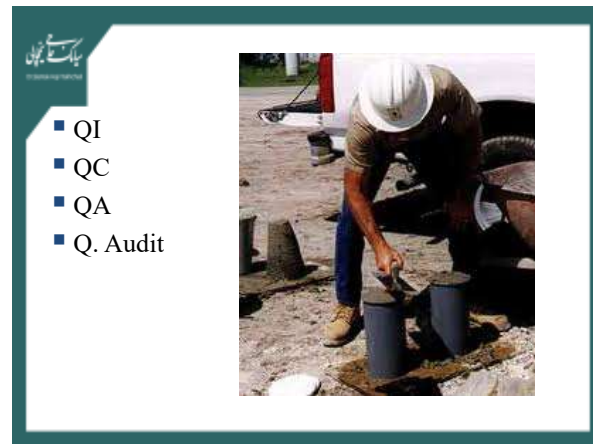
یک ده آباد، به از صد شهر خراب



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نمونه کیفیت و رتبه در پروژه نرم افزاری

- کیفیت بالا
  - بدون عیب مشهود، داشتن راهنما
  - بدون باگ باشد
- رتبه پائین
  - تعداد محدود خصوصیات
  - امنیت سیستم
- کیفیت پایین
  - تقاضی بسیار
  - مستندسازی ضعیف ساختاریافته برای کاربر
  - باگ ها و خطاهای بسیار
- رتبه بالا
  - دارای خصوصیات بیشمار
  - گزارش ساز، فرم ساز

کیفیت (Quality) یا رتبه (Grade)



LONGMAN Dictionary of Contemporary English

**accuracy** noun  
[uncountable]  
the ability to do something in an exact way without making a mistake:  
the accuracy of the ball with opening accuracy.  
the quality of being correct or true (accuracy)  
accuracy of  
the accuracy of government statistics

**accuracy** adjective  
[uncountable]  
the quality of being very exact or correct  
with great accuracy  
The work was carried out with **accuracy** (=the work was done in a carefully planned and exact way)

Accuracy, Precision



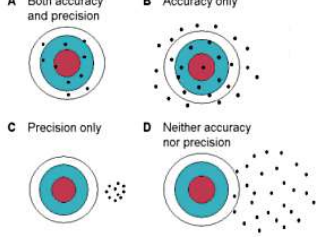
دقت (Precision) و صحت (Accuracy)

A Both accuracy and precision

B Accuracy only

C Precision only

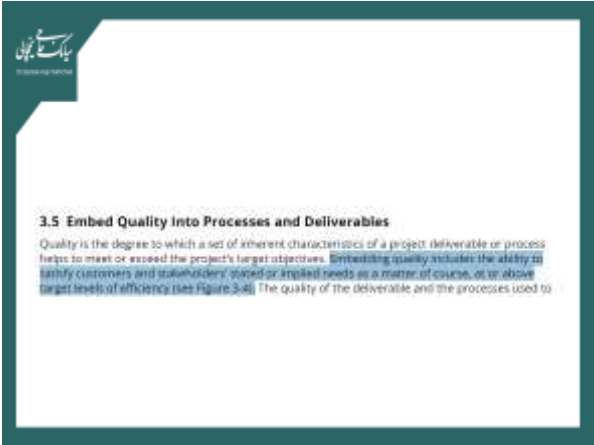
D Neither accuracy nor precision



LONGMAN Dictionary of Contemporary English

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**requirement.** A condition or capability that is necessary to be present in a product, service, or result to satisfy a business need.



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**acceptance criteria.** A set of conditions that are met before deliverables are accepted. See also requirement.



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## Acceptance criteria

- Quality focuses on meeting acceptance criteria for deliverables.



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## Oil Pump vs. Water Pump



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## stakeholders' expectations

- Project quality entails satisfying stakeholders' expectations and fulfilling project and product requirements.

**Example of a prioritization technique – MoSCoW**

Each acceptance criterion is rated as either **Must** have, **Should** have, **Could** have or **Won't** have for now (MoSCoW).

All the 'Must have' and 'Should have' acceptance criteria should be mutually achievable.


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## Examples of quality expectation

The quality expectation for a water pump in a remote village is that it is robust enough to 'last a lifetime', whereas because the oil pump in a racing car needs to be as light as possible, it may only need to last the duration of one race.

**Definition of Done (DoD).**

- Definition of Done (DoD)
- Or Acceptance Criteria.
  - A checklist of all the criteria required to be met so that a deliverable can be considered ready for customer use.



**Definition of Done (DoD).**




**Quality dimensions**

1. Performance.
2. Conformity.
3. Reliability.
4. Resilience.
5. Satisfaction.
6. Uniformity.
7. Efficiency.
8. Sustainability.
9. Compliance



**Performance.**

- Do the deliverables or processes function as intended by the project team and other stakeholders?



**Gravin's 8 Dimensions of Quality**



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A Reliable Delivery Management System



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### Conformity.


- Are the deliverables and processes aligned with specifications and fit for use?



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### Reliability.

- Do the deliverables and processes maintain the consistency necessary to meet or exceed desired outcomes?




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### Satisfaction.


- Do the deliverables and processes elicit valuable feedback from customers and/or end users, including usability and user experience?



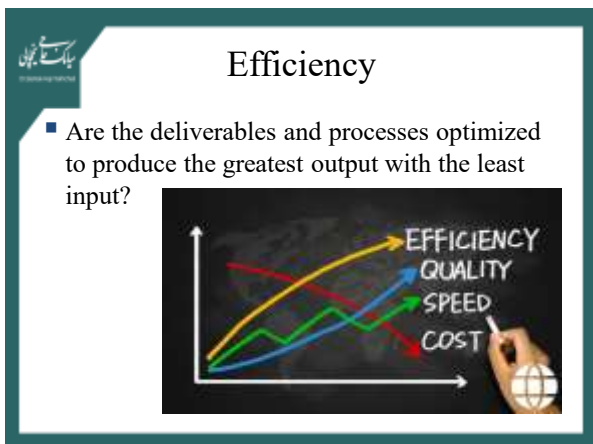
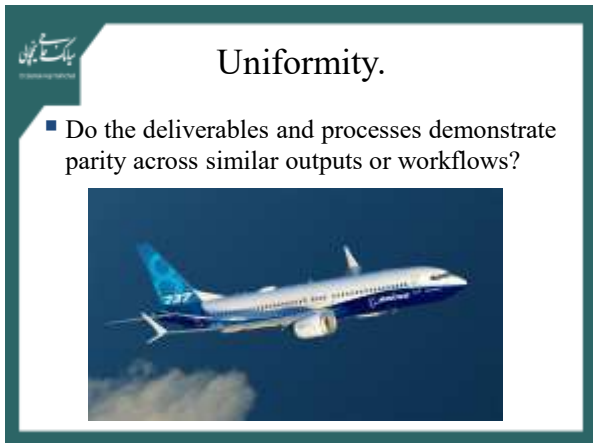
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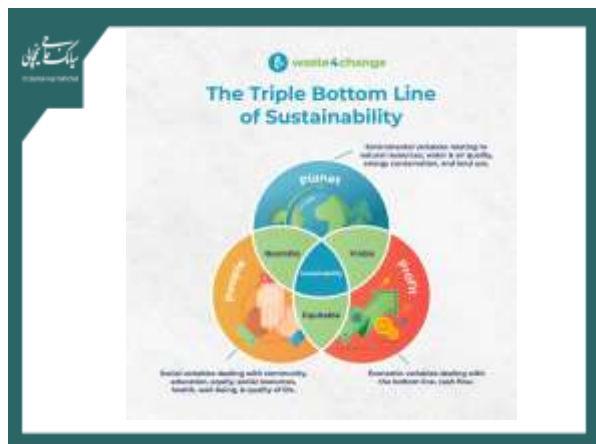
### Resilience.

- Can the deliverables and supporting processes cope with unforeseen failures and recover quickly?







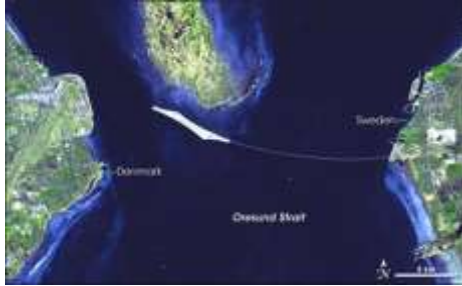


## Sustainability.

- Do the deliverables and processes contribute positively to economic, social, and environmental outcomes?



## Oresund bridge



## Hoover Dam



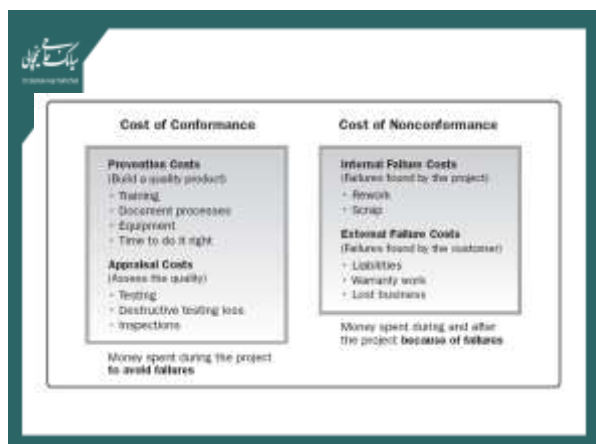
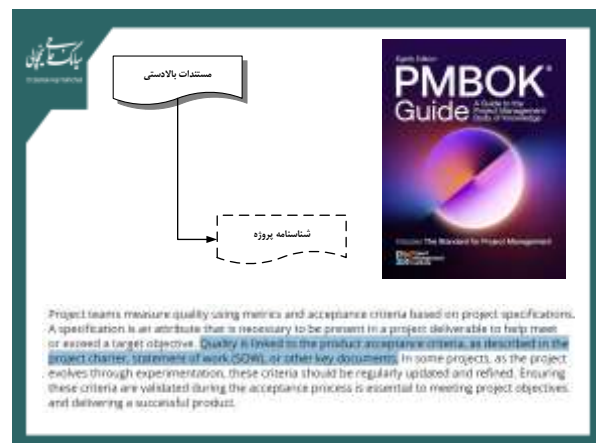
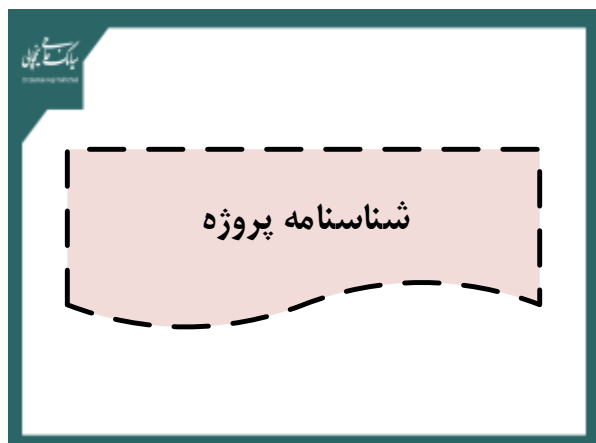
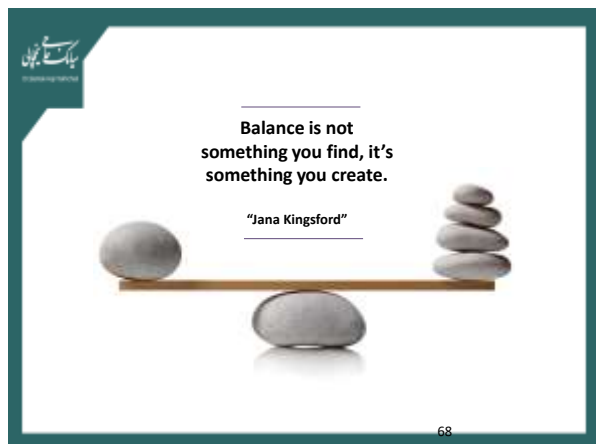
## Quality dimensions

1. Performance.
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8. Sustainability.
9. Compliance



## Compliance

- Do the deliverables and processes comply with regulatory requirements and relevant industry standards, as well as organizational standards?



## Ultrasonic cleaning of heat exchangers



## تعمیرات اساسی پالایشگاه ۱۳۹۱ - کیفیت پروژه

کوره واحد مرکاپتان زدایی ناحیه ۱ شیرین سازی گاز پس از عملیات اسپیدگذاری، برای اولین بار تعمیرات بر روی تیوب های آتش صورت گرفته. قسمتی از تیوب های مورد نظر بدلیل فشار بالا و بی کیفیتی روغن های مورد استفاده آسیب دیده بودند که پس از دستورالعمل بازرسی و همکاری واحد جوشکاری کارگاه مرکزی تعمیر و پس از تست، نصب و در سرویس قرار گرفت.



## ویژگی تفکیک پذیری



## ساختار تفکیک قلم قابل تحویل





