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SOFTWARE ENGINEERING

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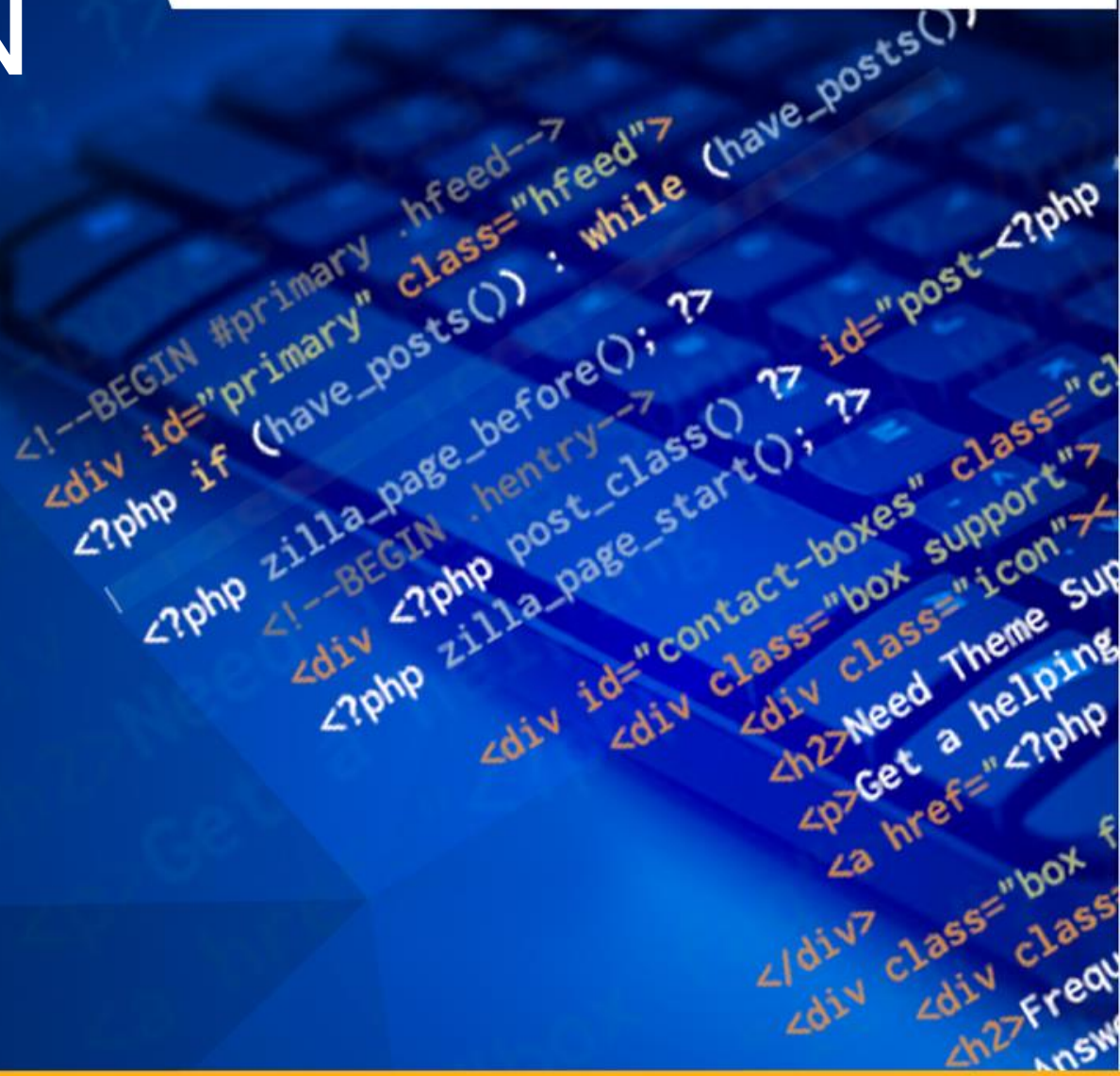
SOFTWARE EVOLUTION & MAINTENANCE

Presented by:
Assoc. Prof. Dr. Mustafa Man
School of Informatics & Applied Mathematics
Universiti Malaysia Terengganu, Malaysia

Email: mph@umt.edu.my



Objectives

To explain why change is inevitable if software systems are to remain useful.

To discuss software maintenance and maintenance cost factors.

To describe the processes involved in software evolution.

Learning Outcome

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Understand the maintenance process and system evolution.

Know the basic techniques for managing of system maintenance.

Software Change

Software change is inevitable

- Improve based on new requirements;
- Business practice changes;
- Updated errors;
- Changes of Hardware;
- The performance and reliability to be improved.

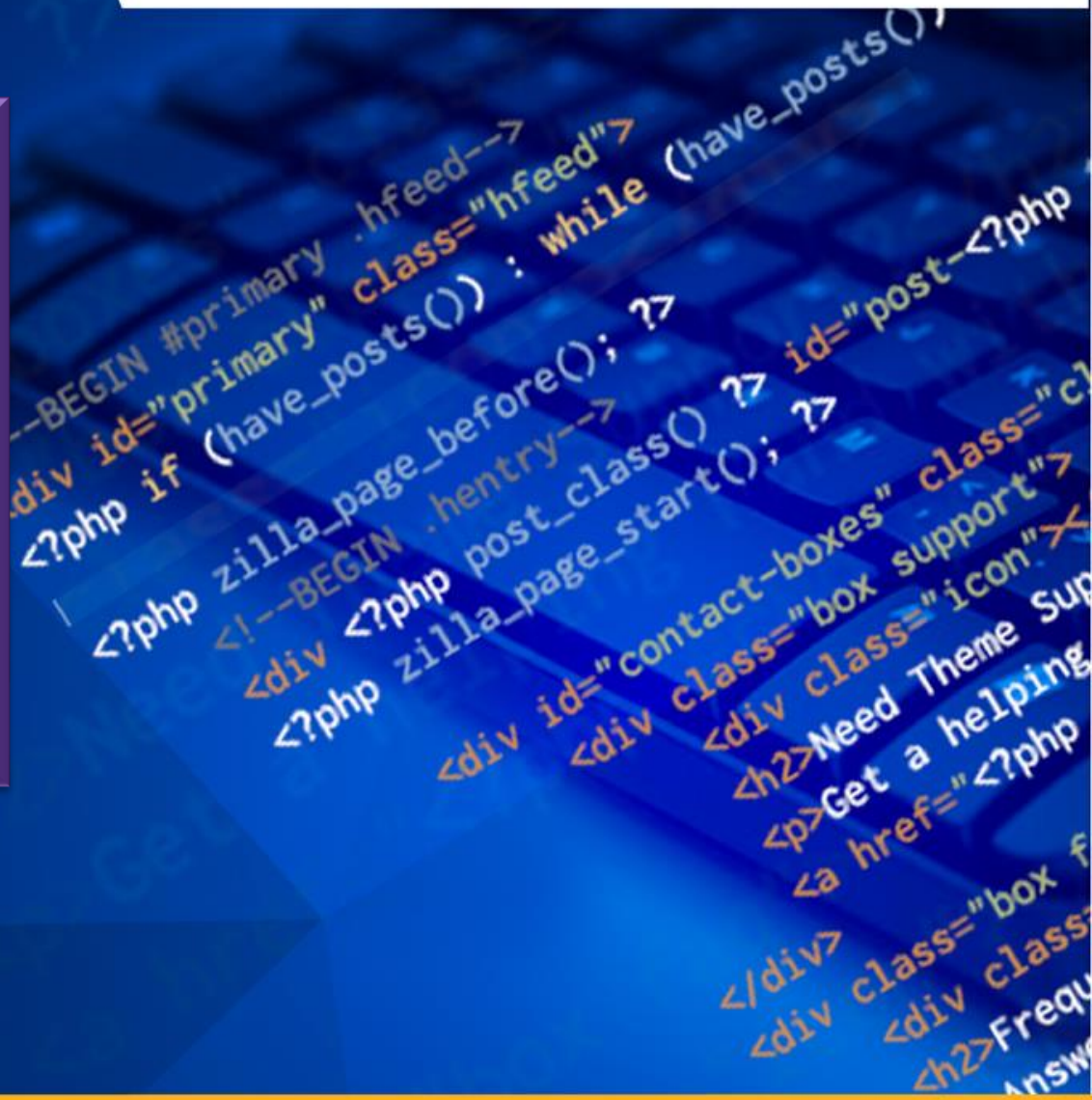
Problem for all organizations is implementing and managing change to their existing software systems.

Importance of Evolution

Organizations have huge investments in their software systems - they are critical business assets.

To maintain the value of these assets to the business, they must be changed and updated.

The majority of the software budget in large companies is devoted to changing and evolving existing software rather than developing new software.



Software Evolution Stages

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Evolution	Servicing	Phase-out
• The stage in a software system's life cycle where it is in operational use and is evolving as new requirements are proposed and implemented in the system.	• At this stage, the software remains useful but the only changes made are those required to keep it operational i.e. bug fixes and changes to reflect changes in the software's environment. No new functionality is added.	• The software may still be used but no further changes are made to it.

Agile Methods

Evolution is simply a continuation of the development process based on frequent system releases.

Agile method are based on incremental development so the transition from development to evolution is a seamless one.

Software Maintenance

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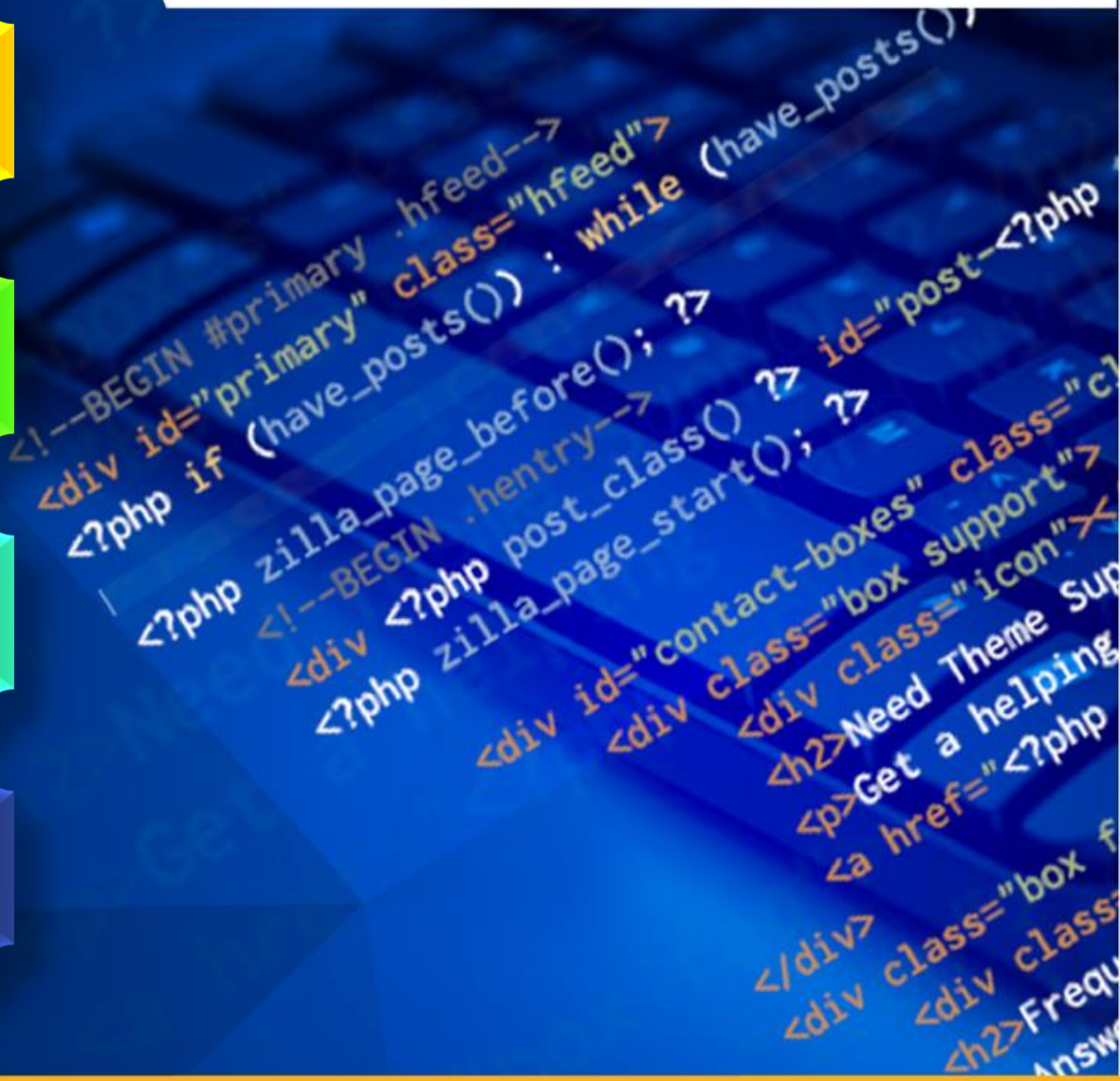
Modifying a program after it has been put into use.

The term is mostly used for changing custom software. Generic software products are said to evolve to create new versions.

Maintenance does not normally involve major changes to the system's architecture.

Changes are implemented by modifying existing components and adding new components to the system.



Types of Maintenance

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Fault repairs

- Changing a system to fix bugs/vulnerabilities and correct deficiencies in the way meets its requirements.

Environmental adaptation

- Maintenance to adapt software to a different operating environment
- Changing a system so that it operates in a different environment (computer, OS, etc.) from its initial implementation.

Functionality addition and modification

- Modifying the system to satisfy new requirements.

Software Reengineering

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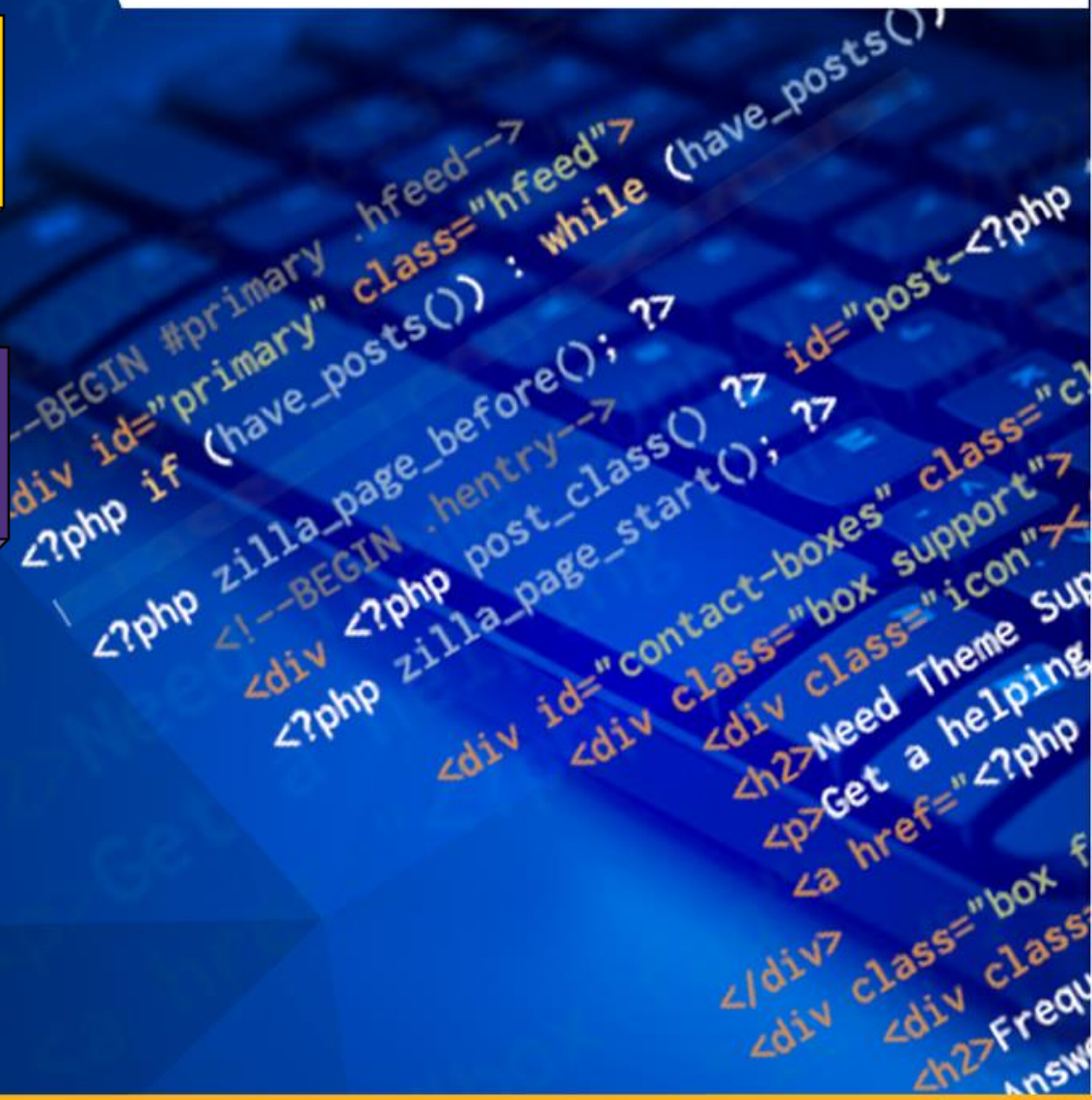
Restructuring or rewriting part or all of a legacy system without changing its functionality.

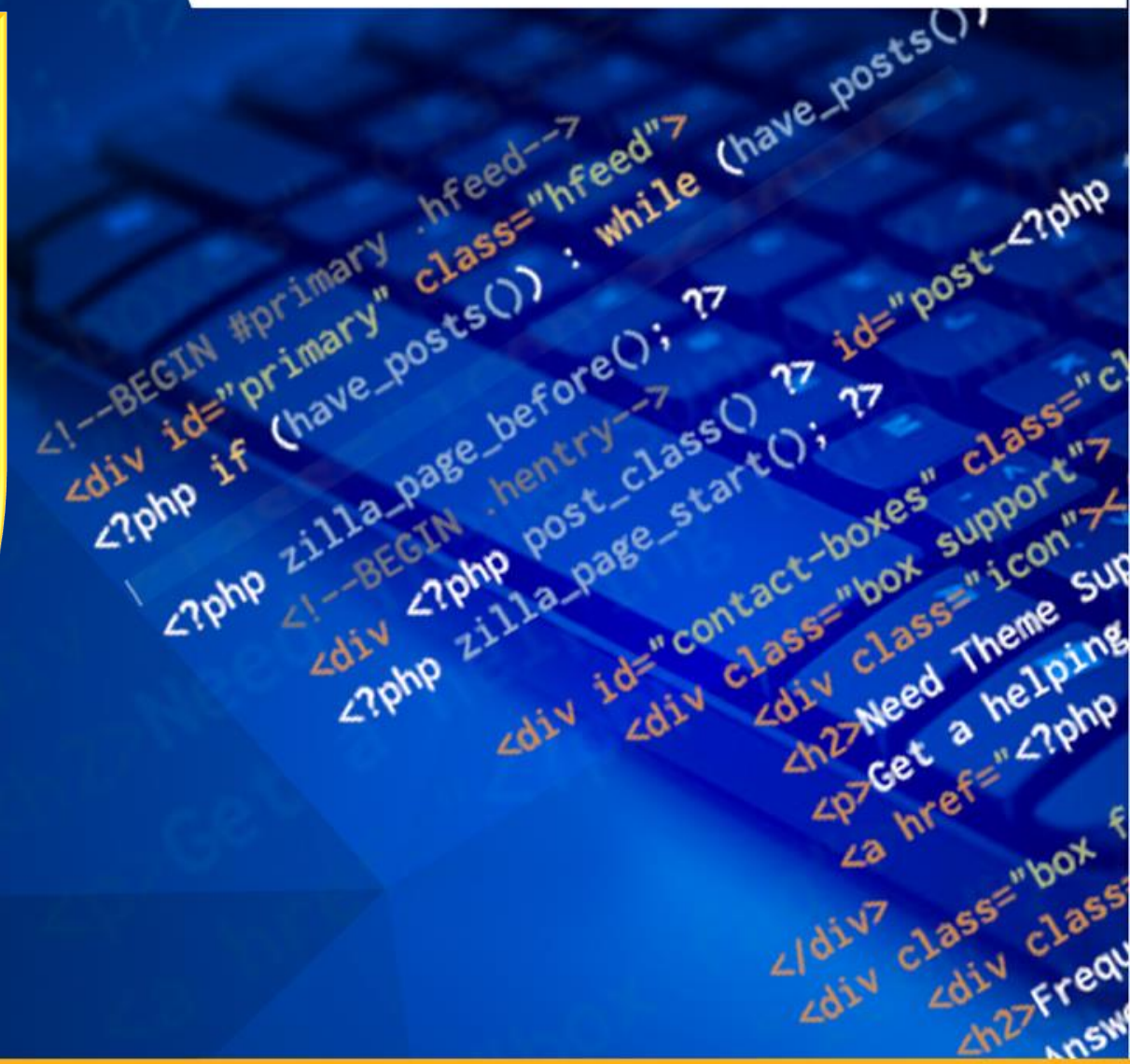
Applicable where some but not all sub-systems
of a larger system require frequent maintenance.

Reengineering involves adding effort to make them easier to maintain. The system may be re-structured and re-documented.



Conclusion

The process of software evolution is driven by requests for changes and includes change impact analysis, release planning and change implementation that involve maintenance and also reengineering process



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THANK YOU