

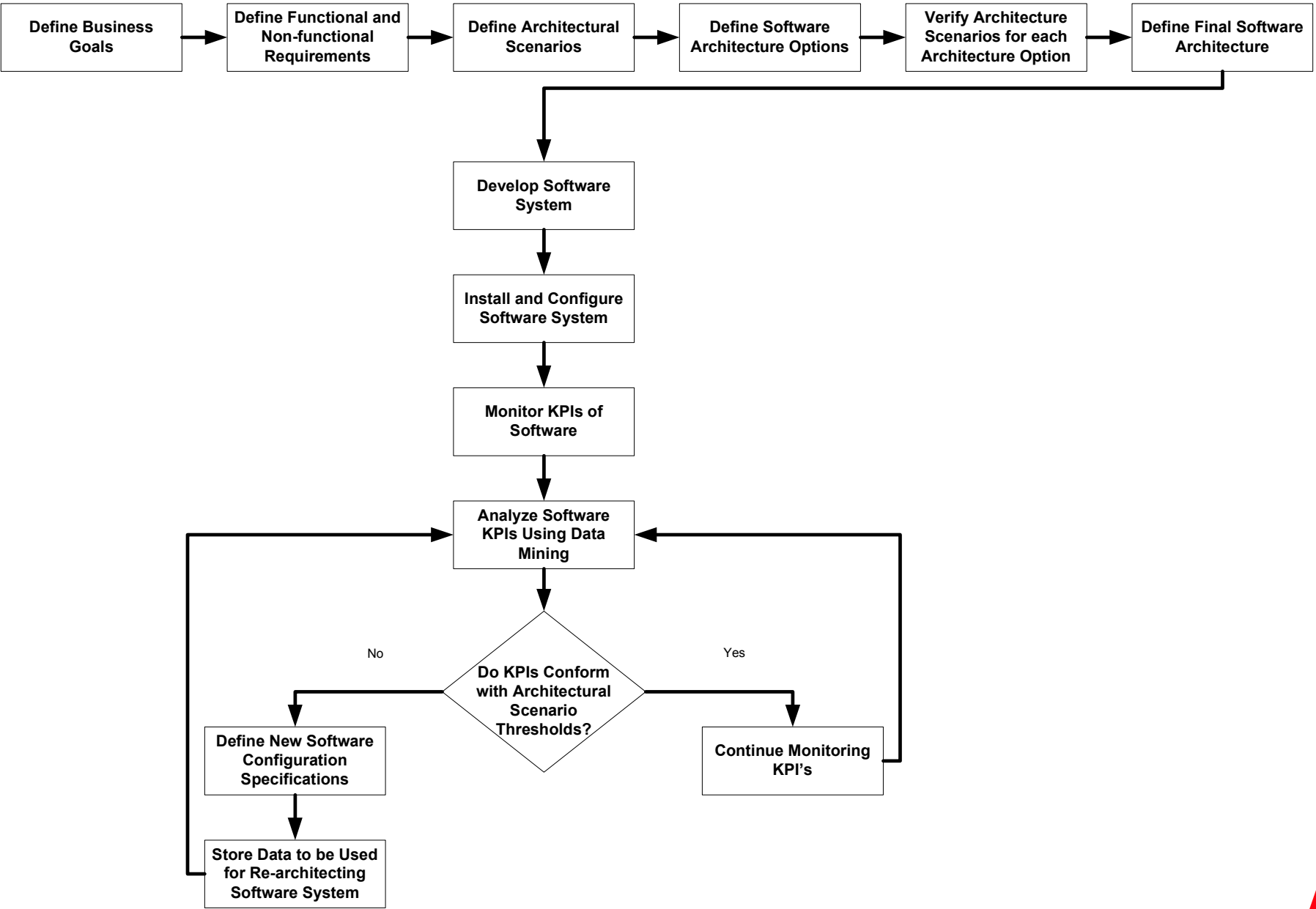
Aldo Dagnino ABB Corporate Research / Industrial Software Systems

Discovering Configuration and Architecture Scenarios SATURN 2010

Agenda

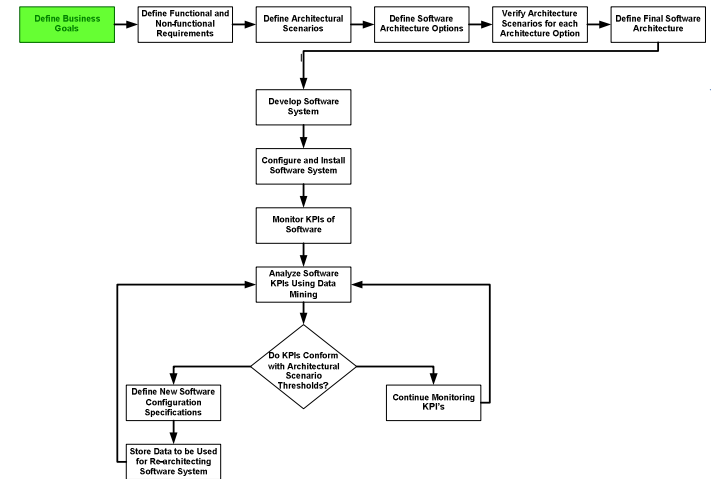
- Define of Architecture and Configuration scenarios
- Discuss model to define Architecture and Configuration scenarios
- Data mining of Configuration scenarios KPI's
- Conclusions

Discovering Configuration and Architecture Scenarios A Model



Discovering Configuration and Architecture Scenarios

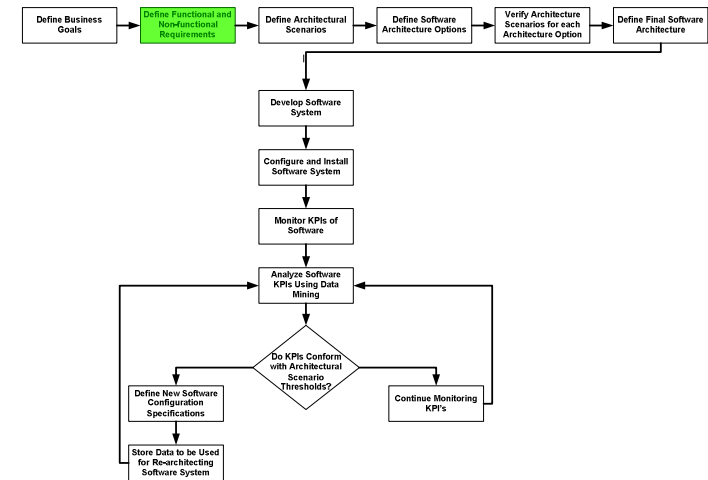
Define Business Goals



- Business goals are defined by system stakeholders.
- Example of business goals include:
 - Ensure the software system has “good” performance
 - The system must be scalable to accommodate customers requirements
 - The systems needs to have high level of usability

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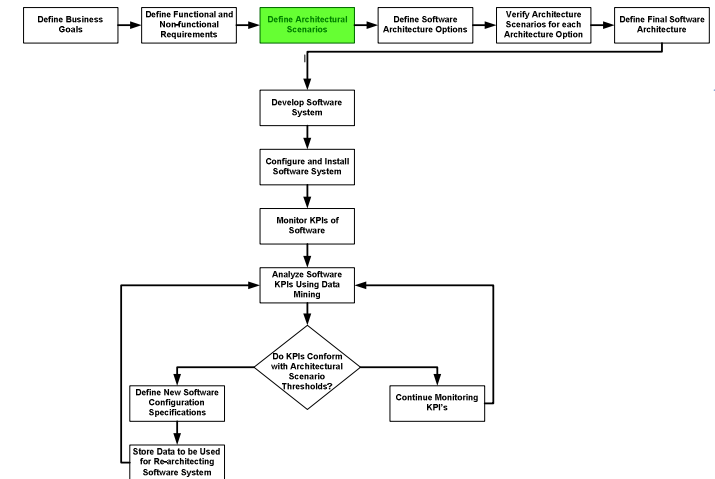
Define Functional and Non-functional Requirements



- Define architectural functional requirements that define the primary functionality of the system are defined
- Define non-functional requirements that associate software qualities with architectural functional requirements

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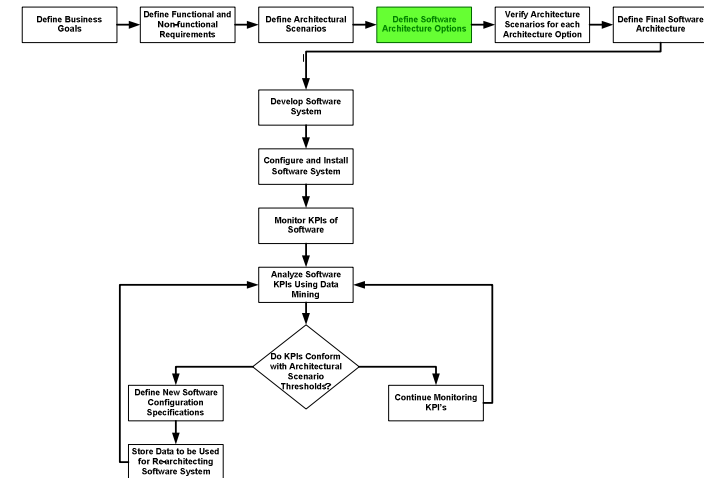
Define Architectural Scenarios



- Combining architectural functional requirements and non-functional requirements to define architectural scenarios used to define the software architecture

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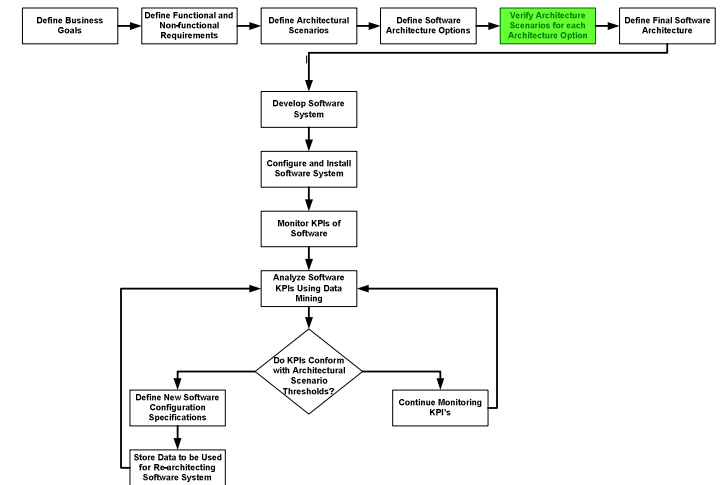
Define Software Architecture Options



- Using the architecture scenarios develop architectural options for the software system

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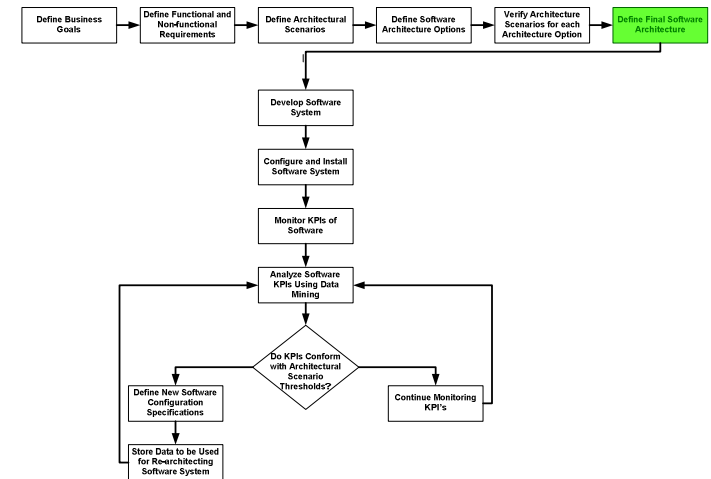
Verify Architecture Scenarios for each Architecture Option



- For architectural options developed use architecture scenarios to test “best” architecture option

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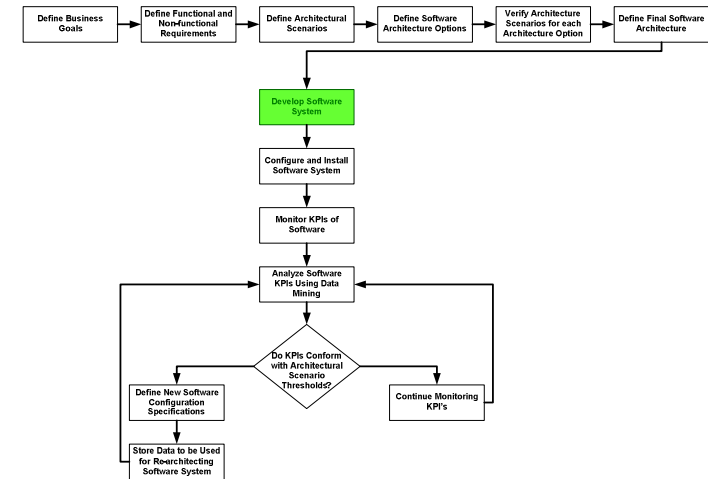
Define Final Software Architecture



- Develop the final architecture option for the system

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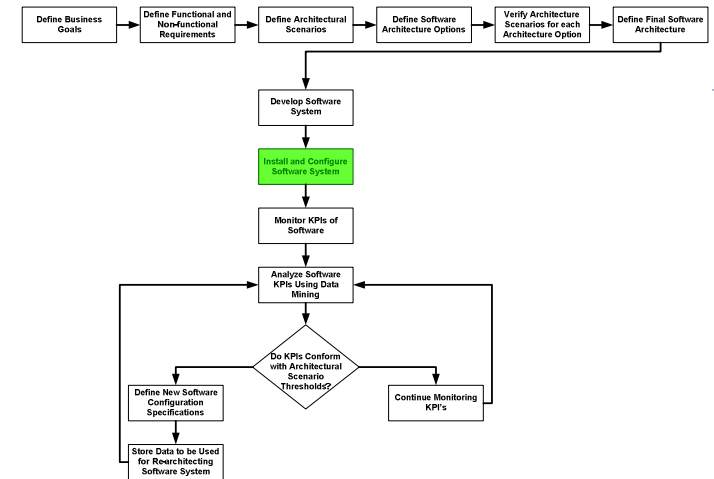
Develop Software System



- Develop software system based on selected architecture

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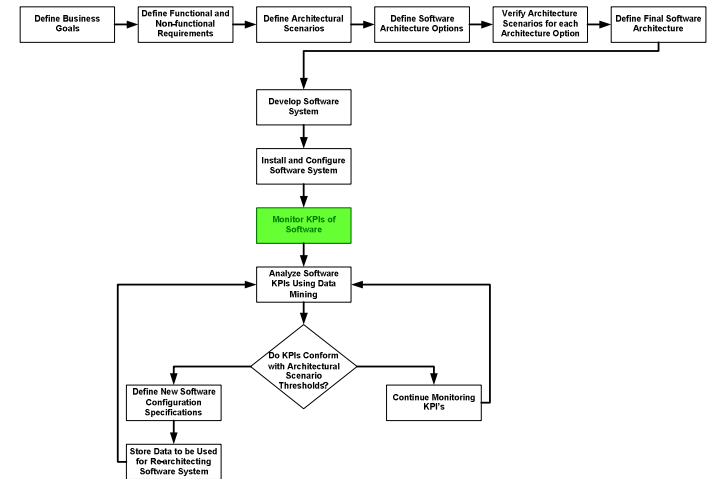
Install and Configure Software System



- Install and configure software system at customer sites

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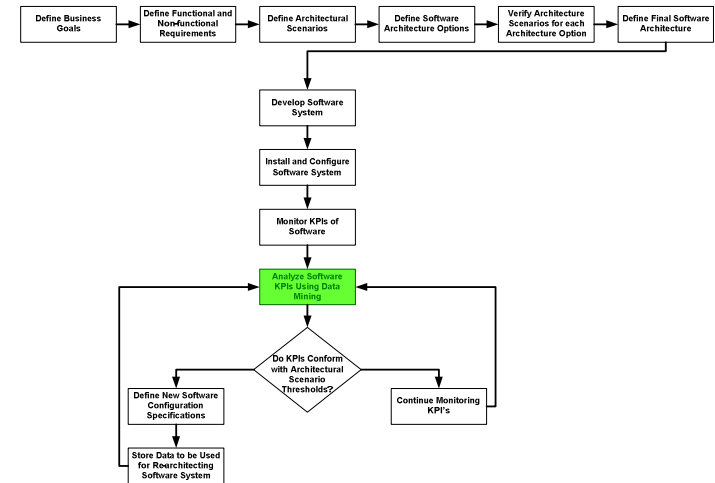
Monitor Key Process Indicators of Software System



- By using sensors in the system, monitor key process indicators on installations

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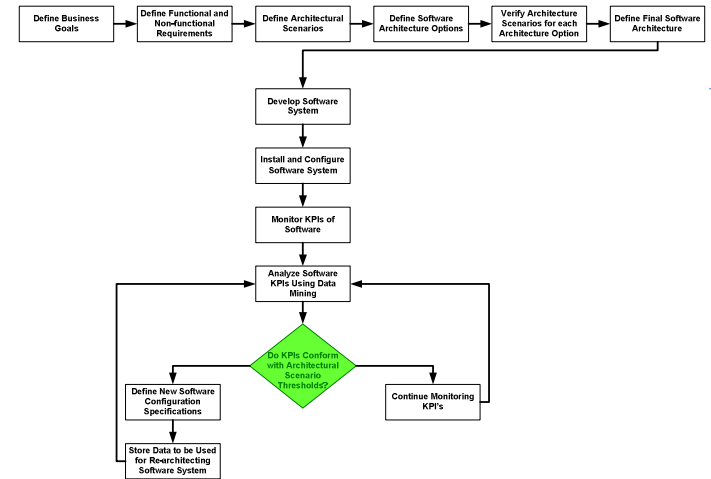
Analyze Software KPIs



- Use data mining techniques to analyze and visualize KPIs stored in historian data repositories with respect to known system thresholds identified in architectural scenarios

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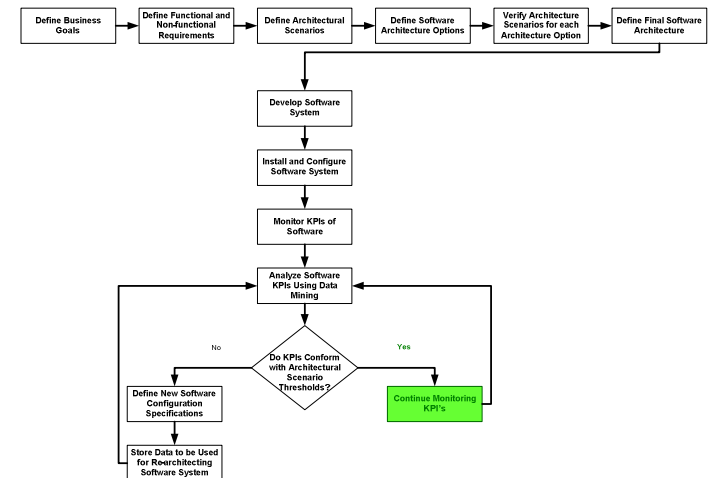
Define if KPIs conform with Architectural Scenarios



- Determine if KPIs stored in historian data repositories are within known system thresholds identified in architectural scenarios

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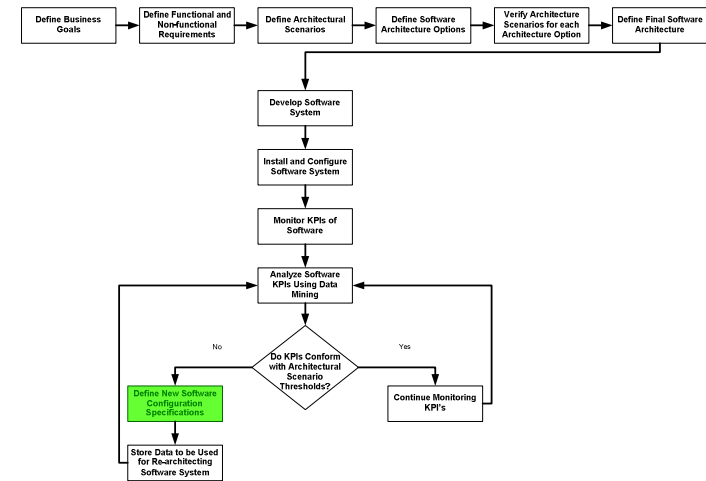
Continue Monitoring KPIs



- If KPIs stored in historian data repositories are within known system thresholds identified in architectural scenarios continue monitoring software system
- Mine historical data at predetermined time periods

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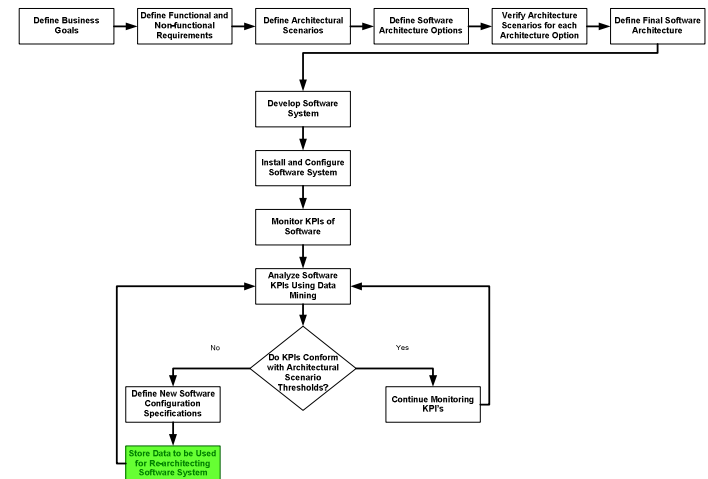
Define New Configurations



- If KPIs stored in historian data repositories are not within known system thresholds identified in architectural scenarios define re-configuration strategy for the software system

Discovering Configuration and Architecture Scenarios

Store Data for Future Use



- Store non-compliant KPIs for future use in re-architecture activities
- Continue monitoring system

Conclusions

- Configuration scenarios are a subset of architecture scenarios
- Instrumenting software to collect KPIs associated with configuration scenarios is important to improve software configuration
- Data mining techniques are an effective way to analyze configuration scenarios KPI's
- Mining configuration scenarios KPI's can provide new knowledge discovery for the software system that can be employed for future re-architecture purposes

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