

Digital transformation using Microservices has become increasingly popular in recent years. Microservices are being used to solve various business and technical limitations created by legacy applications development process. There are Microservices that are embedded and catering to business functionalities using domain-driven design, implementing service orchestration and business processes that often end up as system process flows.

Microservices-based Orchestration



While designing and building API and Microservices-based applications, an organization's perspective towards APIs and Services tends to be tightly coupled with either the back end or front-end systems which inadvertently introduces limitations in the system's ability to adopt business changes. Let us understand this further.

Organizations build their systems in two ways:

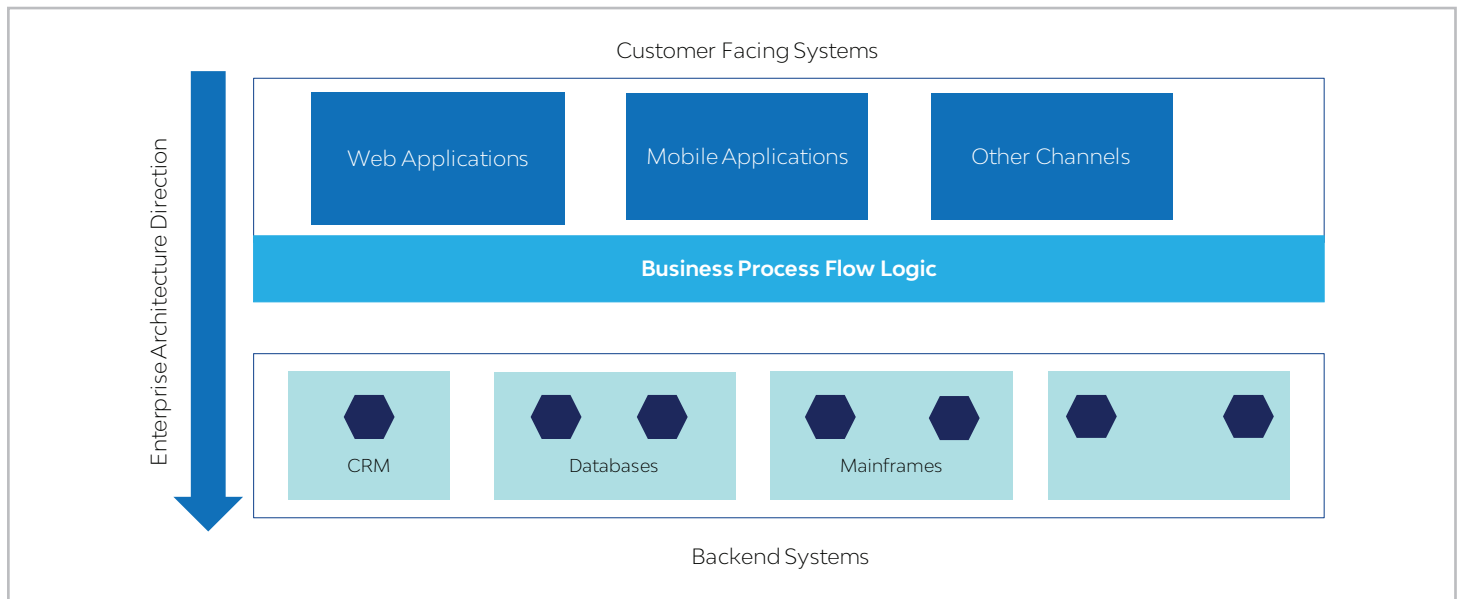
- 01 Channel-centric approach
- 02 Backend systems-centric approach

01

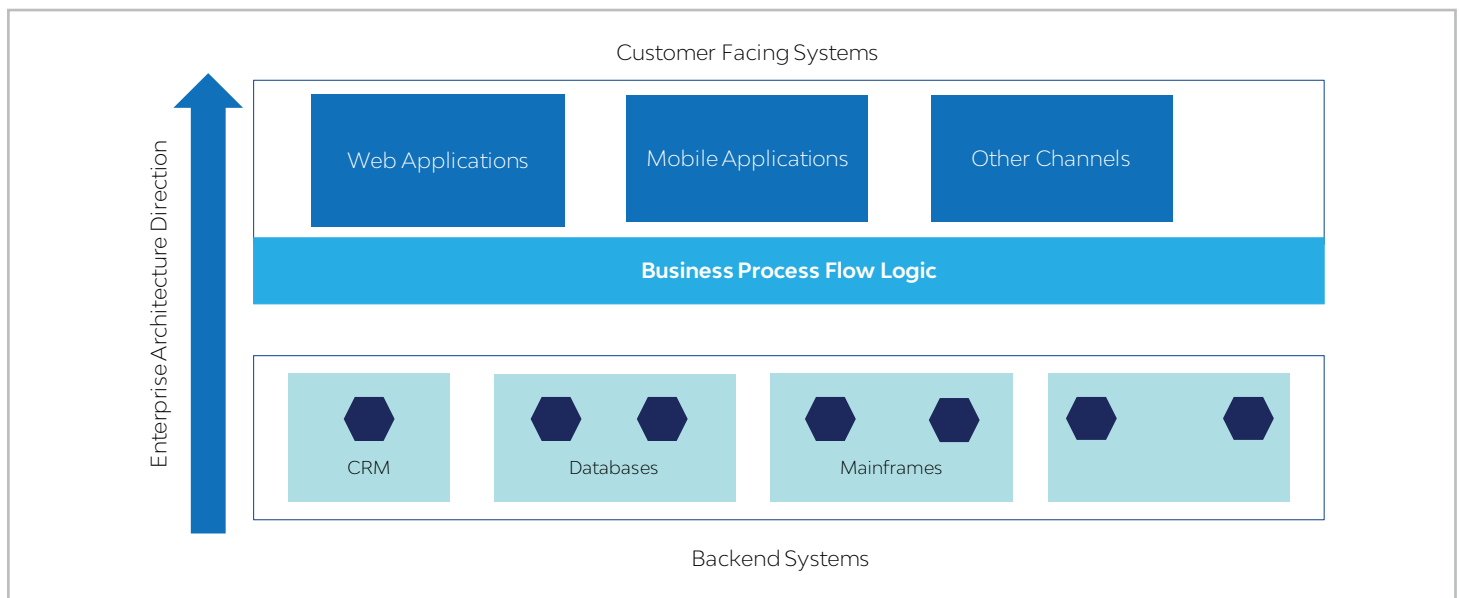
In a **Channel Centric Approach**, the system is built with focus on customer facing systems. This leads to building user experience related functionalities first, followed by the remaining functionalities. This top down approach leads to lot of embedded process and business logic at systems such as web and mobile applications. This is a costly architecture approach as there could be duplicate functionalities in various systems and each system is built in silos making it expensive for an enterprise to stay agile and adapt to changes.

02

In the **Backend Systems Centric Approach**, the enterprise architecture is built with focus on backend systems first, while other functionalities are gradually built into the customer facing systems. This bottom up approach is focused on the backend systems, which are built on various products like CRM, databases and mainframes.



Channel Centric

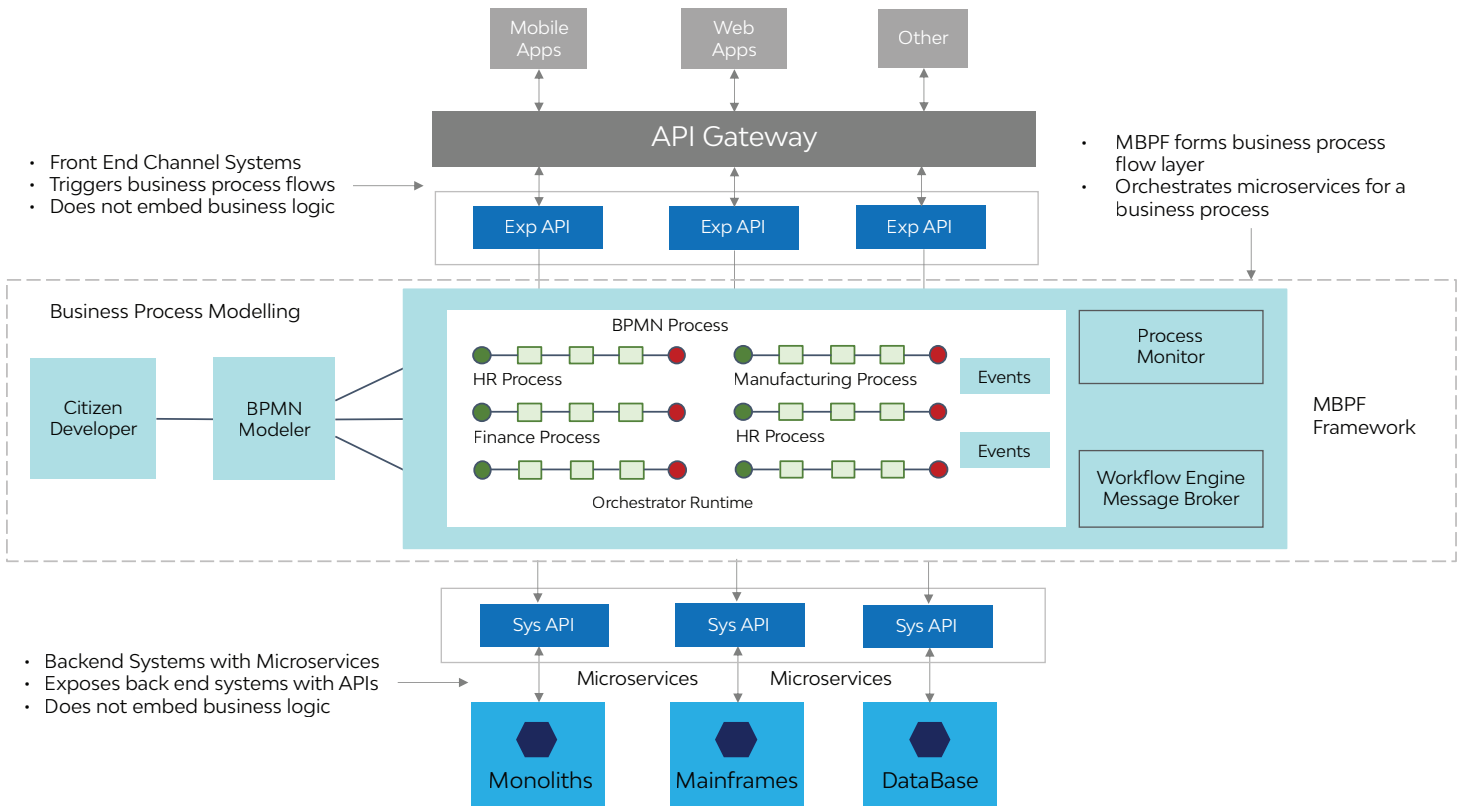


Backend System Centric

Either of these approaches will leave the enterprise systems with some challenges such as:

- ✓ No real time visibility of business processes status
- ✓ Process flow logic is embedded in the microservices
- ✓ The IT team manages everything like tasks, business processes, workflows, code, execution
- ✓ Business processes are not transparent to business

Both the architectural approach lacks a business process and customer-centric approach. A business process-based approach helps avoid limitations of top down or bottom up approach promoting customer goal centric business architecture and makes it independent of customer facing and backend systems thus improving agility.



Microservices Based Process Flow – Framework

In order to avoid mistakes of the channel centric or the backend centric ways approach, the correct way is to start with process layer and build experience and system layers around the business process.

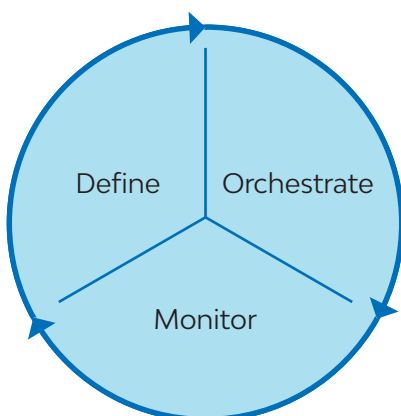
Businesses rely on completion of one or more long running workflows, and each workflow execution is carried out by independently developed and deployed microservices which communicate with each other using REST APIs or pub sub model with no central control on execution. This limits the , thus giving very little visibility on into the state of workflow and the current state of business.

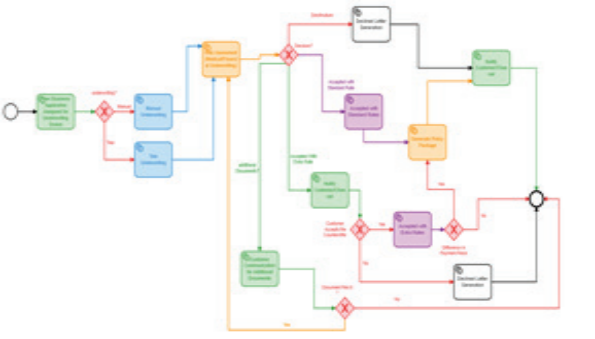
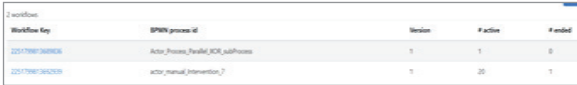
Microservices Based Process Flow (MBPF) bridges this gap and provides a lightweight and scalable modern workflow engine built on latest technological concepts like gRPC, Event sourcing and event aware workflows. The fFramework enables series of microservices to be orchestrated with workflow engine with BPMN capability.

MBPF fast tracks the business process-based development by seamlessly orchestrating microservices.

Framework enables the citizen developer to define the workflows and control the business processes while the MBPF team does the service orchestration, execution and monitoring.

Phases of MBPF



	Activity	Owner	Diagram																																										
Define	<ul style="list-style-type: none"> a. Graphical workflow definition b. Based on BPMN 2.0 standards c. Easy to build and understand business processes d. Citizen developer can build the business process e. Business defines the process workflow f. Maps the microservices 	Citizen Developer																																											
Orchestrate	<ul style="list-style-type: none"> a. Orchestrate across multiple microservices b. Ensures workflow executes as per definition c. Message driven architecture d. Pub Sub communication model e. Visual workflows with BPMN 2.0 Standard f. Builds the microservice g. Does the input/output mapping 	MBPF	<div> <p>Microservices Based Process Flow Framework</p> <p>Select Business Process Flow</p> <p>Please click the browse button to upload the BPMN file.</p> <p>Choose File No file chosen</p> <p>Identify Business Tasks</p> </div> <div> <p>Microservices Based Process Flow Framework</p> <p>Orchestrate Microservice End points</p> <table border="1"> <thead> <tr> <th>#</th> <th>Worker Name</th> <th>End Point Details</th> </tr> </thead> <tbody> <tr><td>1</td><td>underwriting</td><td>http://localhost:8054/underwriting/service/underwriting</td></tr> <tr><td>2</td><td>manual-underwriting</td><td>http://localhost:8054/underwriting/service/manual-underwriting</td></tr> <tr><td>3</td><td>life-underwriting</td><td>http://localhost:8054/underwriting/service/life-underwriting</td></tr> <tr><td>4</td><td>risk-assessment</td><td>http://localhost:8054/underwriting/service/risk-assessment</td></tr> <tr><td>5</td><td>declined-letter-generation</td><td>http://localhost:8054/underwriting/service/declined-letter</td></tr> <tr><td>6</td><td>accepted_with_standard_rates</td><td>http://localhost:8054/underwriting/service/accepted-with-standard-rates</td></tr> <tr><td>7</td><td>notify_customer_channel</td><td>http://localhost:8054/underwriting/service/notify-customer</td></tr> <tr><td>8</td><td>notify_customer_channel</td><td>http://localhost:8054/underwriting/service/notify-customer</td></tr> <tr><td>9</td><td>generate_policy_package</td><td>http://localhost:8054/underwriting/service/generate-policy</td></tr> <tr><td>10</td><td>declined-letter-generation</td><td>http://localhost:8054/underwriting/service/declined-letter</td></tr> <tr><td>11</td><td>accepted_with_extra_rates</td><td>http://localhost:8054/underwriting/service/accepted-with-extra-rates</td></tr> <tr><td>12</td><td>notify_customer_channel</td><td>http://localhost:8054/underwriting/service/notify-customer</td></tr> <tr><td>13</td><td>customer_communication_additional_documents</td><td>http://localhost:8054/underwriting/service/customer-communication</td></tr> </tbody> </table> <p>Generate Worker Scripts</p> <p>Go Back</p> </div>	#	Worker Name	End Point Details	1	underwriting	http://localhost:8054/underwriting/service/underwriting	2	manual-underwriting	http://localhost:8054/underwriting/service/manual-underwriting	3	life-underwriting	http://localhost:8054/underwriting/service/life-underwriting	4	risk-assessment	http://localhost:8054/underwriting/service/risk-assessment	5	declined-letter-generation	http://localhost:8054/underwriting/service/declined-letter	6	accepted_with_standard_rates	http://localhost:8054/underwriting/service/accepted-with-standard-rates	7	notify_customer_channel	http://localhost:8054/underwriting/service/notify-customer	8	notify_customer_channel	http://localhost:8054/underwriting/service/notify-customer	9	generate_policy_package	http://localhost:8054/underwriting/service/generate-policy	10	declined-letter-generation	http://localhost:8054/underwriting/service/declined-letter	11	accepted_with_extra_rates	http://localhost:8054/underwriting/service/accepted-with-extra-rates	12	notify_customer_channel	http://localhost:8054/underwriting/service/notify-customer	13	customer_communication_additional_documents	http://localhost:8054/underwriting/service/customer-communication
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Monitor	<ul style="list-style-type: none"> a. Real time process monitoring b. Graphical interface to show the current state of the process c. Step-by-step current status of each orchestrated microservice d. Deploy the orchestration flow e. Business tracks the flow 	MBPF	 <table border="1"> <thead> <tr> <th>Workflow Key</th> <th>BPMN process ID</th> <th>Version</th> <th># active</th> <th># ended</th> </tr> </thead> <tbody> <tr> <td>00017081348904</td> <td>Actor_Process_FlowID_CCR_WebProcess</td> <td>1</td> <td>1</td> <td>0</td> </tr> <tr> <td>00017081348905</td> <td>actor_manual_intervention_7</td> <td>1</td> <td>20</td> <td>1</td> </tr> </tbody> </table>	Workflow Key	BPMN process ID	Version	# active	# ended	00017081348904	Actor_Process_FlowID_CCR_WebProcess	1	1	0	00017081348905	actor_manual_intervention_7	1	20	1																											
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Let's Solve



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Framework highlights

- ✓ Helps decentralization whereby the citizen developer manages the business flow and technical teams manage the functional Microservices
- ✓ Modern Workflow engine with event aware workflows
- ✓ Workflows that span multiple microservices in low latency, high-throughput scenarios
- ✓ Visual workflows based on BPMN 2.0 standards
- ✓ Complete transparency of business processes and sequential execution of Microservices
- ✓ Ensure workflow completion with negative business scenario handling
- ✓ Light weight, scalable with high throughput and low latency

Benefits

- ✓ End-to-end tracking and visibility of current state of your business process using monitoring dashboard
- ✓ Clear separation of concerns: the business team manages business process flows and IT team manages logic
- ✓ Business processes are transparent and gives better control to business teams
- ✓ Agile and configurable Business processes by abstracting process flow logic from core microservices

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