

| Factors                                                                                           | Elements                                 | Definition/ Example                                                                                                                                                                                                                                            | Maturity Stages                                                                     |                                                                                                                                                          |                                                                                                                                                           |                                                                                                                                                                                             |                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                   |                                          |                                                                                                                                                                                                                                                                | Initial                                                                             | Rudimentary                                                                                                                                              | Standalone                                                                                                                                                | Systematic                                                                                                                                                                                  | Optimizing                                                                                                                                                                         |
| <div>Organization</div> <div>Organization enables significant process mining</div>                | Purpose                                  | Describes the scope of process mining <b>use cases</b> in the organization, as well as the <b>long-term strategies</b> and <b>vision</b> . A use case contains a process mining <b>technique</b> , a <b>process</b> and an expected <b>benefit</b> .           | No specific <b>use case</b> has been defined yet.                                   | A <b>first use case for process mining</b> exists in the organization.                                                                                   | A <b>vision</b> is written down, supported by <b>performance indicators and a monitoring</b> .                                                            | The application of process mining is <b>continuously expanded</b> based on a <b>roadmap</b> with regard to <b>new techniques or processes</b> .                                             | A long-term pursued vision is <b>continuously developed</b> and <b>systematically reviewed</b> .                                                                                   |
|                                                                                                   | Center of excellence for process mining  | Bundles the effort for process mining in the organization, thus <b>accelerating the adoption</b> .<br>- Leadership and managerial support<br>- Technical support and trainings<br>- Methodological support, best practices                                     | <b>No unit</b> of the organization <b>bundles support</b> for process mining.       | One unit deals with process mining with focus on <b>one specific use case</b> . Time horizons are <b>short-term</b> .                                    | An <b>interdisciplinary team</b> addresses <b>multiple use cases</b> . Time horizons are <b>medium-term</b> .                                             | A (centralized or hybrid) <b>Center of excellence</b> guides role assignment, tasks, and duties for process mining. Time horizons are <b>long-term</b> .                                    | Process mining is established and <b>anchored it in the organizational structure</b> . Time horizons are <b>visionary</b> and <b>future-oriented</b> .                             |
|                                                                                                   | Process centricity                       | The organizations aspiration is to <b>think and work cross-functionally</b> .                                                                                                                                                                                  | <b>No process awareness</b> (functional divisions act and optimize for themselves). | Initial <b>process awareness</b> through <b>cross-functional</b> process oriented thinking.                                                              | <b>Cross-functional</b> process management (e.g. fixed responsibilities, standardization measures and KPIs).                                              | <b>Target-driven</b> end-to-end processes (e.g. proactive action and strategic alignment of processes).                                                                                     | <b>Continuous optimization</b> of end-to-end processes.                                                                                                                            |
|                                                                                                   | Evidence centricity                      | Data is generally used to <b>base decisions</b> in the organization.                                                                                                                                                                                           | <b>Data is not</b> used for <b>decision support</b> .                               | <b>Data is passively collected</b> but not used for decision support.                                                                                    | <b>Data is actively collected</b> , but not actively used to support decisions (i.e. there is no need to view the data).                                  | <b>Data is actively used</b> for decision support.                                                                                                                                          | <b>Data-based standard solutions</b> are established in relevant business areas and account for the main source of information.                                                    |
|                                                                                                   | Change centricity                        | <b>Culture and organization</b> is open for change.                                                                                                                                                                                                            | Corporate culture is <b>rigid</b> .                                                 | Changes only happen <b>top-down</b> .                                                                                                                    | A culture of change is established among employees, especially in the form of an <b>active error culture</b> .                                            | <b>Mistakes</b> are seen as a <b>chance</b> for improvement.                                                                                                                                | <b>Change</b> is considered <b>natural</b> at all levels.                                                                                                                          |
|                                                                                                   | Methods of process mining project phases | Maturity of <b>methods in the organization to structure tasks</b> of process mining project phases.<br>- Workshops or structuring templates<br>- Data map<br>- Process models like CRISP-DM or PM²                                                             | No supporting methods in use.                                                       | Supporting methods are <b>undocumented</b> .                                                                                                             | Supporting methods are <b>documented</b> .                                                                                                                | Supporting methods are <b>linked to project phases</b> and become mandatory.                                                                                                                | Methods are <b>bundled and further developed</b> in one place.                                                                                                                     |
| <div>Data foundation</div> <div>Environment enables sufficient process mining</div>               | Process-oriented IT-systems              | Describes the <b>maturity of used IT-systems</b> regarding <b>completeness</b> and <b>reliability</b> for event logs.                                                                                                                                          | Data is mainly recorded <b>by hand</b> .                                            | The majority of <b>data</b> is recorded <b>automatically</b> as a by-product of IT-systems, but there is <b>no claim to completeness</b> or reliability. | Data is <b>automatically recorded</b> by IT-systems and the <b>data</b> in the system is <b>reliable</b> , but there is <b>no claim to completeness</b> . | Data is <b>automatically recorded</b> by IT-systems and is <b>complete and reliable</b> .                                                                                                   | In addition, <b>data protection, security</b> , and <b>semantically clear structures</b> are guaranteed.                                                                           |
|                                                                                                   | Data accessibility                       | <b>Access</b> to data can be given <b>quickly</b> to relevant entities.<br>- Reduction of datasilos<br>- Uniform and optimal format<br>- Reduction of access time                                                                                              | Data is <b>not optimally accessible</b> .                                           | First business units develop a <b>strategy to increase accessibility</b> .<br><br>Data is only <b>extracted on demand and in a costly manner</b> .       | The strategies are <b>extended and aligned</b> .<br><br>Data is only extracted on demand, but in a <b>fixed procedure</b> .                               | Hurdles are systematically removed, and <b>access times are accelerated</b> through targeted measures.<br><br>Extraction is standardized and <b>enables immediate data transformation</b> . | Data is <b>directly accessible</b> at any time according to the analysis questions <b>without additional IT effort</b> .                                                           |
|                                                                                                   | Scope of the data                        | Data is <b>annotated, transformed</b> and <b>enriched</b> with further information according to its process-specific context.<br>- Meta data<br>- Additional attributes like resource, order size, type of product etc.<br>- Completeness of contextualization | No additional <b>description</b> of the data.                                       | <b>Limited</b> data scope, with manual extensions and testing.                                                                                           | <b>Functional</b> data scope, with first automated contextualization for specific application scenarios.                                                  | <b>Advanced</b> data scope, through corporate standards for contextualization.                                                                                                              | Data is <b>automatically extended</b> by its context.                                                                                                                              |
| <div>People´s knowledge</div> <div>People understand process mining</div>                         | Handling process mining tools            | The ability to use <b>suitable tools independently at the right time</b> .<br>- Knowledge of functional scope<br>- Knowledge about tool limitations                                                                                                            | <b>No knowledge</b> exists in handling process mining tools.                        | Relevant business units have <b>unpracticed knowledge</b> about process mining tools.                                                                    | <b>Operational, autonomous knowledge</b> of process mining tools available in relevant business areas.                                                    | Relevant business areas have routinized knowledge in the use of tools and can <b>solve complex tasks autonomously</b> .                                                                     | A <b>knowledge management</b> , carried out by a <b>separate unit</b> , is implemented to facilitate <b>knowledge externalization</b> and <b>networking</b> across business areas. |
|                                                                                                   | Technical basics                         | <b>General knowledge</b> of IT topics.<br>- Integration and dashboarding<br>- Database queries<br>- Operational support                                                                                                                                        | <b>No knowledge</b> exists on technical basics.                                     | Relevant business units have <b>theoretical knowledge</b> of technical basics.                                                                           | <b>Operational, autonomous knowledge</b> of technical basics available in relevant business areas.                                                        | Relevant business areas have routinized knowledge of technical basics and are able to <b>solve complex tasks autonomously</b> .                                                             | A <b>knowledge management</b> , carried out by a <b>separate unit</b> , is implemented to facilitate <b>knowledge externalization</b> and <b>networking</b> across business areas. |
|                                                                                                   | Data preparation                         | Data can be processed to <b>increase its information content</b> .<br>- Preprocessing pipeline<br>- Filters for data<br>- Detect human errors and incompleteness                                                                                               | <b>No knowledge exists</b> on data preprocessing.                                   | Relevant business units have <b>theoretical knowledge</b> of data preprocessing.                                                                         | <b>Operational, autonomous knowledge</b> of data pre-processing available in relevant business areas.                                                     | Relevant business areas have routinized knowledge of data preprocessing and can <b>solve complex tasks autonomously</b> .                                                                   | A <b>knowledge management</b> , carried out by a <b>separate unit</b> , is implemented to facilitate <b>knowledge externalization</b> and <b>networking</b> across business areas. |
|                                                                                                   | Classic data mining                      | Knowledge about the general <b>handling of large data sets</b> .<br>- Clustering<br>- Dimension reduction<br>- Feature selection<br>- Machine learning                                                                                                         | <b>No knowledge</b> exists of classic data mining.                                  | Relevant business units have <b>theoretical knowledge</b> about classical data mining.                                                                   | <b>Operational, autonomous knowledge</b> of classic data mining available in relevant business areas.                                                     | Relevant business areas have routinized knowledge of classical data mining and can <b>solve complex tasks autonomously</b> .                                                                | A <b>knowledge management</b> , carried out by a <b>separate unit</b> , is implemented to facilitate <b>knowledge externalization</b> and <b>networking</b> across business areas. |
|                                                                                                   | Process mining basics                    | Basic knowledge in process mining: <b>process mining techniques</b> , process <b>representations</b> (Petri nets, DFG, BPMN, etc. ), <b>algorithms</b> .<br><br>- Advantages and disadvantages are known<br>- Tailoring to use case                            | <b>No knowledge</b> exists of process mining basics.                                | Relevant business units have <b>theoretical knowledge</b> about process mining basics.                                                                   | <b>Operational, autonomous knowledge</b> of process mining basics available in relevant business areas.                                                   | Relevant business areas have routinized knowledge of process mining basics and can <b>solve complex tasks autonomously</b> .                                                                | A <b>knowledge management</b> , carried out by a <b>separate unit</b> , is implemented to facilitate <b>knowledge externalization</b> and <b>networking</b> across business areas. |
|                                                                                                   | Advanced application                     | Process mining for <b>use cases beyond the main techniques</b> (discovery, conformance, enhancement).<br><br>- Control flow, organization, case, time perspective<br>- Process flows<br>- Predictive process mining                                            | <b>No knowledge</b> exists on advanced applications.                                | Relevant business units have <b>theoretical knowledge</b> on advanced applications.                                                                      | <b>Operational, autonomous knowledge</b> of advanced applications in relevant business areas available.                                                   | Relevant business areas have routinized knowledge of advanced applications and can <b>solve complex tasks autonomously</b> .                                                                | A <b>knowledge management</b> , carried out by a <b>separate unit</b> , is implemented to facilitate <b>knowledge externalization</b> and <b>networking</b> across business areas. |
| <div>Scope of the process mining activity</div> <div>Holistic application of process mining</div> | Discovery                                | Process discovery describes how to <b>create process models</b> from event logs.<br>- Create actual process models<br>- Incorporate knowledge from domain experts<br>- Enrich process model with additional data                                               | Process mining is <b>not used</b> for process discovery.                            | Process discovery is used for <b>simple proof of concepts or not by the organization itself</b> .                                                        | Process discovery is used in <b>selected use cases</b> by the organization itself.                                                                        | Process discovery is used for <b>all relevant business processes</b> .                                                                                                                      | The use of process discovery is <b>continuously optimized and expanded</b> .                                                                                                       |
|                                                                                                   | Analysis                                 | Analysis describes the <b>data-based analysis</b> of processes with regard to dimensions such as <b>time, quality, complexity or costs</b> .<br>- Quantitative analysis (flow analysis, cycle time ...)<br>- Conformance checking                              | Process mining is <b>not used</b> for process analysis.                             | Process analysis is used for simple proof of concepts or <b>not by the organization itself</b> .                                                         | Process analysis is used in <b>selected use cases</b> by the organization itself.                                                                         | Process analysis is used for <b>all relevant business processes</b> .                                                                                                                       | The use of process analysis is <b>continuously optimized and expanded</b> .                                                                                                        |
|                                                                                                   | Monitoring and controlling               | Ongoing <b>monitoring</b> and control of processes by means of <b>key process indicators</b> .                                                                                                                                                                 | Process mining is <b>not used</b> for process monitoring and controlling.           | Process monitoring and controlling are used for simple proof of concepts <b>not by the organization itself</b> .                                         | Process monitoring and controlling are used in <b>selected use cases</b> by the organization itself.                                                      | Process monitoring and controlling are used for <b>all relevant business processes</b> .                                                                                                    | The use of process monitoring and controlling is <b>continuously optimized and expanded</b> .                                                                                      |
|                                                                                                   | Operating advanced use cases             | Process mining is used specifically for <b>advanced application</b> scenarios such as <b>prediction</b> or <b>automated execution of actions</b> .                                                                                                             | Process mining is <b>not used</b> for advanced applications.                        | Advanced applications are applied to simple proof of concepts or <b>not by the organization itself</b> .                                                 | Advanced applications are applied to <b>selected use cases</b> by the organization itself.                                                                | Advanced applications are applied to <b>all relevant business processes</b> .                                                                                                               | The use of advanced applications is <b>continuously optimized and expanded</b> .                                                                                                   |
| <div>Governance</div> <div>Guidelines for process mining application</div>                        | Method / tool governance                 | The maturity of guidelines that define <b>who can and must use which tools/methods</b> .<br>- Which tool for which use case<br>- Which method in which phase of the BPM lifecycle                                                                              | <b>No or undocumented</b> method/ tool guidelines.                                  | <b>Documented</b> method/tool guidelines, but <b>not consistently enforced</b> .                                                                         | <b>Documented</b> method/tool guidelines are visible at a central location for all stakeholders and are consistently <b>enforced</b> .                    | Future and historical changes to method/tool guidelines are <b>visible for all stakeholders at a central location</b> .                                                                     | Governance matters are <b>bundled and further developed</b> at one entity within the organization.                                                                                 |
|                                                                                                   | Roles and responsibilities               | The maturity of policies that define <b>accountability and role assignment</b> for process mining in the organization.<br>- For employees, but also for other actors (crowdworkers, robots, smart devices, software)                                           | <b>No or undocumented</b> roles and responsibilities.                               | <b>Documented</b> responsibility guidelines, but <b>not consistently enforced</b> .                                                                      | <b>Documented</b> responsibility guidelines are visible at a central location for all stakeholders and are consistently <b>enforced</b> .                 | Future and historical changes to responsibility guidelines are <b>visible for all stakeholders at a central location</b> .                                                                  | Governance matters are <b>bundled and further developed</b> at one entity within the organization.                                                                                 |
|                                                                                                   | Process governance                       | The maturity of standards and guidelines for <b>process decisions</b> .<br>- Who gets to modify processes and when?<br>- Who defines and measures process performance?<br>- Who documents and actualizes processes?                                            | <b>No or undocumented</b> process guidelines.                                       | <b>Documented</b> process guidelines, but <b>not consistently enforced</b> .                                                                             | <b>Documented</b> process guidelines are visible at a central location for all stakeholders and are consistently <b>enforced</b> .                        | Future and historical changes to process guidelines are <b>visible for all stakeholders at a central location</b> .                                                                         | Governance matters are <b>bundled and further developed</b> at one entity within the organization.                                                                                 |
|                                                                                                   | Data governance                          | The maturity of <b>guidelines</b> for management and <b>control</b> over the use of <b>(process) data</b> .<br>- Who is allowed to view process data and when?<br>- Who may grant access to data and when?                                                     | <b>No or undocumented</b> data guidelines.                                          | <b>Documented</b> data guidelines, but <b>not consistently enforced</b> .                                                                                | <b>Documented</b> data guidelines are visible at a central location for all stakeholders and are consistently <b>enforced</b> .                           | Future and historical changes to data guidelines are <b>visible for all stakeholders at a central location</b> .                                                                            | Governance matters are <b>bundled and further developed</b> at one entity within the organization.                                                                                 |